

**MINISTERIAL ADVISORY GROUP ON ROADING COSTS**  
FINAL REPORT AUGUST 2006





## FOREWORD



A top Government priority is to transform New Zealand into a competitive force in the global market. New Zealand businesses will produce superior goods and services in a sustainable manner.

Critical to our economic transformation is improved transport infrastructure.

The Government recognises that increased investment is vital to this, and in the 2006 Budget we signalled our long-term commitment to land transport infrastructure by allocating an additional \$1.3 billion to transport over the next five years, bringing the total spend over the next 10 years to over \$24 billion. In addition to this significant boost in funding, we also introduced a new regime which provides greater levels of certainty. This is good news for roading investment going forward.

The Government is mindful that we need to make sure that as investment increases, New Zealand is getting value for money.

In February 2006, the Minister of Transport appointed the Advisory Group on Roothing Costs to identify the drivers of cost increases in the roading sector by looking at construction costs, technical standards, tendering processes and other inputs, and to ascertain whether they are justified or avoidable.

The Advisory Group met with key industry stakeholders, central government agencies and local government to provide an independent view on how to maximise the value we get from our \$24 billion and better manage input cost pressures.

I want to thank the Advisory Group chair Clive Tilby and members Jo Brosnahan, Alan Isaac and Stuart McKenzie for their work, assessment and recommendations.

A handwritten signature in black ink that reads "Annette King". The signature is written in a cursive, flowing style.

**Hon Annette King**  
Minister of Transport



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## 1.0 EXECUTIVE SUMMARY

### **Purpose**

*The Minister of Transport appointed the Advisory Group on Roading Costs 'to assist the government to ascertain whether recent and forecast cost increases and changes to ten-year outputs are justified or avoidable.'*<sup>1</sup>

The Advisory Group found that although input costs significantly contributed to reduced 10-year outputs, it was the refinement of estimates, together with changes in project scope that were the greatest influence.

Estimation processes have improved, but there is still a need to review the strategic planning and detailed decision-making framework to ensure optimal selection and scope and thereby control the growth in project costs in the future.

In the 2006 Budget, Government guaranteed a 5-year package of state highway construction projects. The need to make optimal use of these funds is a driving force behind the value-for-money initiatives now being considered by Transit New Zealand, and behind this report's recommendations.

### **Roading sector context**

The roading sector has been subject to much change in recent years. The introduction of the New Zealand Transport Strategy (NZTS) and the Land Transport Management Act 2003 (LTMA) in particular have established far wider transport objectives. One important outcome of these changes has been to enable greater attention to more complex urban roading development.

Recent higher levels of road construction, along with the generally high level of infrastructure work in other sectors, has placed greatly increased demands on the supply market. Suppliers have responded by increasing investment, but the sellers' market has driven significant cost increases, especially in Auckland.

### **Increased scale and complexity of projects**

The selection of optimal project scope and execution of projects in the urban environment, where construction spending is highest, has become the most important factor in ensuring value for money from government funding. State highway construction through or near cities has to take into account complex urban planning and roading network issues, as well as the resulting challenges associated with land purchase and limiting environmental and social effects. The industry is still adjusting to this new environment.

### **Reliability of project cost estimation**

The Advisory Group found that a significant component of the change in forecast costs over the life cycle of some construction projects has been related to the reliability of estimation. Transit NZ has greatly improved the reliability of its project estimation since 2003 through better processes, full recognition of input cost drivers, and an improving understanding of the likely outcomes of interpretation of new legislation.

What remains a challenge is the assessment of ground conditions at the early evaluation stages of a project. Uncertainty of geotechnical conditions always makes establishing reliable estimates difficult and the Advisory Group strongly recommends to Land Transport New Zealand that there is earlier and fuller funding of investigation and research work to provide better scope and risk assessment of projects. This uncertainty appears to have been well recognised in the commissioning of substantial investigative work on the Transmission Gully project.

<sup>1</sup> Ministerial Advisory Group on Roading Costs, Terms of Reference, June 2006.

### **Project scope selection**

Several of the case studies commissioned by the Advisory Group indicate that changes in project scope through the investigation, design, and, to a lesser extent, construction phases have been the major contributor to increased cost forecasts. Evidence, including comment from both Land Transport NZ and Transit NZ, indicates that scope containment has in recent years been a lower priority when balanced against the time imperatives for early construction starts.

The Group noted that time pressures appeared to be a major factor in the ready acceptance of increases in project scope; in order to overcome potential opposition to a project. It would have expected a more robust process of scope evaluation, similar to that demonstrated for some other smaller projects. Only in this way can it be determined whether particular costs are fully justified and unable to be avoided.

While commending the objectives of the NZTS and the LTMA, the Advisory Group considers that to achieve value for money, there needs to be a strengthening of the focus on cost efficiency in the evaluation of projects. Roading sector participants and communities need to accept that affordability is a key issue. They need to work together to understand the costs of their choices and to achieve an appropriate balance between local community, regional and national interests.

The Advisory Group believes that there is a strategic gap between the NZTS and existing strategic and planning processes that needs to be filled. The development of a national strategy for land transport, together with a more detailed roading strategy, is required to provide better direction for the agencies, with clearly defined and measurable national objectives against which roading projects can be evaluated. This framework would enable better alignment in the planning and decision-making processes between the agencies and regional and local government. The strategies would take account of the urban planning context and the roading network considerations that will influence all major roading projects in the future.

The Advisory Group also recommends that value-for-money indicators should be incorporated into the performance monitoring system. Land Transport NZ should take an enhanced role in evaluating major projects and monitoring scope and cost. Collaborative leadership in an environment of partnership between the Ministry of Transport (the Ministry) and the transport entities is also essential.

### **Design standards**

The selection and application of design standards for roading is an area that the Advisory Group considers should be reviewed. While there are review provisions, in many situations, standards are too rigidly applied and innovation may be stifled.

A review should also question whether the adoption of international standards is justified in the New Zealand context from the viewpoint of value for money and affordability.

When considering urban highway projects, the Advisory Group also notes that selection of design speed and consideration of induced traffic effects have a major influence on project cost. The Advisory Group agrees with Transit NZ that these are areas of priority that should be closely monitored to ensure optimal scope selection for each new project.

**Input cost increases**

Rises in road construction input costs in the past 5 years have resulted in overall project cost increases in the range of 30 to 40 percent. Increases have been generally higher in Auckland than in other regions. International competition for key resources, such as fuel, steel, and skilled staff, has been an uncontrollable factor that is likely to continue as a significant influence on input costs in the foreseeable future.

The input cost increases are largely considered a consequence of expansion of the sector after more than a decade of low capital investment. The sector has moved from a subsistence mode to a growth mode, which, providing there is continued certainty of work, will result in increased productivity and capacity through increased investment in capital and human resources.

The Advisory Group considers the rise in input costs was largely unavoidable and notes very similar trends in a number of other countries. Further rises are likely in the medium term, but costs will eventually moderate at a higher base level. Cost increases after this point should be closer to underlying inflation.

Land costs have increased significantly since 2000 and will remain a major time and cost factor in the delivery of new roading. Given the increasing number of complex urban projects, successful implementation of Transit NZ's recently developed property-management system is essential to keep land costs to a minimum.

Ten-year forecast maintenance expenditure levels have been increasing significantly faster than inflation since 2003/04 for both local roads and state highways. The reasons for increases in forecast expenditure primarily relate to higher forecasts of heavy commercial vehicle growth. The increased expenditure has generally been expected and allowed for in most maintenance categories, but cost increases have been most noticeable in area-wide pavement treatment. This is primarily related to the traffic control and other costs of working in an urban environment and the increased use of asphaltic concrete on heavily trafficked road networks.

**Market competitiveness**

There has in recent years been considerable supply consolidation in the construction and supply industry, with marked vertical integration by some of the larger companies. The same trend has been identified in other countries such as Australia and the United States.

In New Zealand, overall competition levels for both road construction and maintenance are less than ideal. However, there is no evidence that this in itself has increased input costs significantly. Capacity constraints in a buoyant market, rather than a fundamental lack of competition, are considered to have been more important in driving recent cost increases.

Transit NZ, as part of its current Value for Money project, is considering initiatives to achieve an adequate number of bidders for its projects, including assistance in overcoming barriers to entry where considered appropriate. The Advisory Group strongly supports these initiatives.

**Procurement**

The Advisory Group notes that Transit NZ in recent years has developed many suitable types of procurement for both construction and maintenance delivery. These range from traditional methods to more modern collaborative delivery types, including alliancing. Alliancing is seen as an effective delivery model for some projects but it is important that scope is tightly controlled within the project budget and that the target out-turn cost negotiated represents a significant stretch for the commercial participants to achieve the further profit incentives available under the alliance structure.

The Advisory Group supports Transit NZ's developments in procurement, especially its efforts to obtain earlier contractor involvement. Models that allow allocation of risks to the party best able to control these risks are most likely to lead to the lowest project out-turn cost. Inequitable risk transfer to the industry may be reflected in increased margins.

Some local bodies advised that they would prefer more relaxation of Land Transport NZ's competitive pricing procedure (CPP) rules to enable them to explore new procurement models. Land Transport NZ is currently undergoing a re-evaluation of its procurement rules, which the Advisory Group understands will assist. In the meantime, local bodies do have access to Land Transport NZ for special dispensation from CPP rules for selected projects.

## 2.0 TERMS OF REFERENCE

The Advisory Group was appointed by the Minister of Transport in March 2006 'to assist the government to ascertain whether recent and forecast cost increases and changes to ten-year outputs are justified or avoidable.'<sup>2</sup>

The Advisory Group's Terms of Reference (attached as Appendix 1) set out the scope of the review as being 'to identify the drivers of cost escalation in the Transit NZ road maintenance and construction programme, and in local authority road construction and maintenance, to the extent that it is co-funded by Land Transport NZ; including:

- input costs
- supply constraints and competitive forces in the construction industry and their effect on price escalation
- design and other technical standards used
- scale and complexity of projects
- expansion of project scope
- the processes involved in planning and managing a project from estimations through to delivery and monitoring and reporting on programmes, and
- contracting and tendering processes, including size of contracts.'

The Advisory Group was asked to identify recommendations that could be implemented within the existing statutory framework.

### 2.1 APPROACH

The Advisory Group's approach was to research existing material, consult with stakeholders, gather and analyse evidence, test conclusions, and present recommendations.

Research was commissioned on input costs, industry competitiveness, economic environment, and maintenance costs. The Advisory Group also commissioned case studies of 11 state highway construction projects and two local authority construction projects.

A bibliography of reports and papers considered by the Advisory Group is attached as Appendix 2. Submissions received are noted in Appendix 2.1.

The Advisory Group consulted with a wide range of stakeholders and accepted written submissions. A full list of stakeholders consulted by the Advisory Group is attached as Appendix 3.

### 2.2 RELATIONSHIP BETWEEN THE ADVISORY GROUP AND THE REVIEW OF VALUE FOR MONEY IN THE LAND TRANSPORT SECTOR (EXG REVIEW)

The Advisory Group's review will contribute to the Review of Value for Money in the Land Transport Sector (EXG Review). Although the EXG Review is led by the Ministry of Transport, the Advisory Group's report is an independent report for the Minister of Transport.

In undertaking its review, the Advisory Group was also asked to have regard to the Value for Money project led by Transit NZ and the review of procurement procedures for physical works and professional services led by Land Transport NZ.

<sup>2</sup> Ministerial Advisory Group on Roading Costs, Terms of Reference, May 2006.

The Advisory Group has adopted a definition of value for money similar to that used in the EXG Review. Value for money is defined by the Advisory Group as:

$$\text{Value for money} = \frac{\text{Optimal selection under the NZTS}}{\text{Efficient, cost-effective delivery}}$$

The Advisory Group identified the following issues that are key to achieving value for money in the roading sector.

- Scope, strategy, and planning relate to optimal selection under the NZTS.
- Input costs, competitiveness, and procurement practices all affect efficient, cost-effective delivery.

The Advisory Group considers that an essential element of ensuring value for money is the justification of costs. Optimal project selection requires consideration of affordability; therefore, any costs that do not deliver incremental benefits within what can be afforded should be avoided.

## 2.3 BACKGROUND

### 2.3.1 FUNDING FOR LAND TRANSPORT AND GUARANTEE FOR STATE HIGHWAY CONSTRUCTION

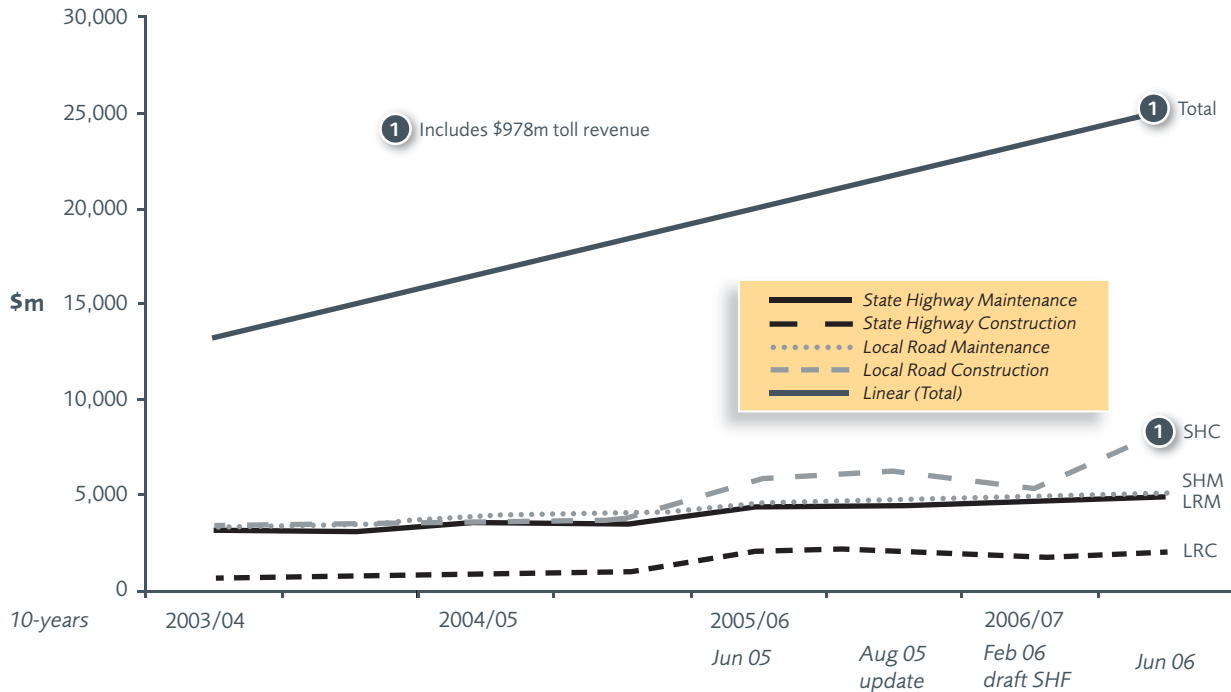
The New Zealand economy has been growing strongly since mid 1990, but it was not until 2002 that additional funding became available for road construction projects (see Appendix 4.1 for construction expenditure as a percentage of GDP and Appendix 4.2 for details of recent increases in the 10-year forecast). Forecast National Land Transport Programme (NLTP) expenditure has now almost doubled, from approximately \$13 billion in 2003/04 to approximately \$25 billion in 2006/07 as shown in Chart 1. This includes the 2006 Budget announcement of an extra \$1.3 billion over the next 5 years<sup>3</sup> and takes account of reduced 10-year revenue forecasts.

The Budget announcement guarantees revenue for the NLTP. It also guarantees the construction of a 5-year package of state highway projects despite possible future revenue reductions or cost escalation. The Advisory Group believes that this funding guarantee makes it even more important that the projects are delivered in a way that provides value for money.

The guarantee for state highway construction signals a change in funding priorities for land transport. Previously, maintenance and passenger transport were given priority, with money allocated to these activity classes first as part of the NLTP allocation process carried out annually by Land Transport NZ. This allocation process often resulted in state highway construction being a 'financial balance' for the NLTP.

<sup>3</sup> The 2006 Budget announcement of \$1.3 billion included \$642 million to restore the levels of activity across the NLTP to those published in August 2005, and \$425 million to accelerate the construction of selected major state highway projects.

**Chart 1. 10-year National Land Transport Programme expenditure forecast <sup>4</sup>**



Source: Information collated by Ministry of Transport from published National Land Transport Programme documents.

**2.3.2 RECENT COST INCREASES IN ROAD MAINTENANCE AND CONSTRUCTION**

Issues of cost escalation first arose with the release of Transit NZ's Draft 2006/07–2015/16 10 year State Highway Forecast in February 2006, which saw a marked reduction in the number of projects programmed for construction from the levels published in August 2005.<sup>5</sup>

Transit NZ's Draft 2006/07–2015/16 10 year State Highway Forecast was based on an indicative funding allocation from Land Transport NZ that reduced funding for local authority construction by \$213 million and for state highway construction by \$643 million.

The reduction in funding was a result of cost increases in the police, passenger transport, and maintenance activity classes, and reduced 10-year revenue forecasts. It was further compounded by increased cost estimates for state highway construction projects.

The Government has signalled its desire to maintain the levels of activity published in August 2005. This will be achieved through the 2006 Budget announcement and will be supported by value for money investigations being carried out across the sector.

<sup>4</sup> Chart 1 illustrates separate 10-year expenditure forecasts for road maintenance and construction activity classes only. All other activity classes (such as regional development, administration, passenger transport, walking and cycling, and police) are included in the total NLTP expenditure.

<sup>5</sup> In August 2005, activity levels across the NLTP were increased by a government decision to invest a one-off tax boost of \$500 million in transport infrastructure.

### 2.3.3 SCALE AND COMPLEXITY

One important factor that impacts on all of the drivers of cost escalation identified by the Advisory Group is the increased scale and complexity of the projects being programmed, particularly by Transit NZ. The majority of projects are in urban or semi-urban environments, particularly in Auckland.<sup>6</sup>

The increase in the scale and complexity of projects has been influenced by the Government's commitment to increase land transport funding and to achieve the broader outcomes of the NZTS and the LTMA.

In developing a new evaluation framework to assess projects against the objectives of the LTMA, Land Transport NZ decided that a capped benefit-cost ratio (BCR) would not be the only evaluation tool used. Previous evaluation criteria required a BCR of 4 and saw predominantly small rural projects prioritised for funding as few large urban projects were able to meet the BCR requirements.

## 2.4 ORGANISATIONAL, STRATEGIC, AND LEGISLATIVE CHANGE

*In the past 5 years the transport sector has seen significant organisational, strategic, and legislative change (see Appendix 4.3 for a summary).*

Organisational change resulted from the Transport Sector Review (2004), which assessed the capability of the sector to deliver on the Government's strategic vision for transport (see Appendix 4.3.1 for detail of current roles, responsibilities, and accountabilities across the sector).

The NZTS was developed before this organisational change. Its vision for transport replaced more narrow safety and efficiency goals and set out that 'by 2010 New Zealand will have an affordable, integrated, safe, responsive and sustainable transport system'. Although the NZTS is not a statutory document, the vision and objectives have been incorporated into the LTMA, passed in 2003, establishing the framework for land transport funding and planning (see Appendix 4.3.2 for an overview of the strategic documents that guide planning in the roading sector).

The most recent strategy is the Government's Transport Sector Strategic Directions Document (TSSD), released in December 2005. The TSSD is a strategy for those components of the NZTS that require transport agencies to plan and work collaboratively.

<sup>6</sup> Forty-eight percent of large construction expenditure is programmed for the Auckland region over the next 10 years (Demand for Construction Resources in the Auckland Region, Saha International Ltd, 7 July 2006).

### 3.0 CASE STUDIES

The results of the case studies commissioned by the Advisory Group are summarised in Table 1, with details in Appendix 6. Two of the projects were investigated in depth: the planning and construction of the Albany–Puhoi realignment (ALPURT B2) project and the planning and design of the Victoria Park Tunnel project (also known as Harbour Bridge to City).

The Transit NZ projects were chosen because in each project, costs had increased significantly through the project life cycle. These projects do not represent a statistical sample of all state highway construction projects, but have been useful for identifying specific cost drivers.

The case studies indicate that, although input-cost increases have been significant, increased costs relating to scope change have been the main cost driver. It is difficult, however, to separate the impact of scope change from other estimating issues.

The Advisory Group also believes that reporting to the boards of both Transit NZ and Land Transport NZ can be improved, especially when assessing incremental costs and benefits.

**Table 1. Summary of key cost drivers for Transit NZ and local authority construction case studies**

		Cost change \$ million Years of estimates	Estimate	Scope change		Input costs
				Engineering decisions including design standards	Environmental and community mitigation	
Transit NZ	ALPURT B2 (toll road)	82–340 1997–2006	**	**	***	*
	Victoria Park Tunnel	165–320 2001–2006	***		**	*
	Bell Block Bypass	8.8–20.2 1999–2005	***			
	Grafton Gully	95–64 2000–2005	**	***		*
	Mangatawhiri Deviation	15.5–50 1999–2005	**	***		
	Waiouru Connection	10–20 2003–2006	***	**		*
	Northern Busway	95–200 2003–2006	***		**	*
	Inner City Bypass	32–53 1999–2004	**			**
	Waterview Connection (Avondale)	72–1380 1996–2009	**		***	*
	Manukau Extension SH20 to SH1	125–225 2000–2006	**		***	*
Harbour Link	135–241 2002–2005	**	***			
Local authorities	Tauranga Eastern Arterial	99–388 1998–2006	***	**		
	Whangaparaoa Road (Rodney District Council)	13.0–15.2 2001–2005	*			*
	Kerikeri Bypass (Far North District Council)	8.6–14.3 2003–2005	***			**

Key: \* Minor impact \*\* Moderate impact \*\*\* Major impact

This table represents broad judgement only of the relative magnitude of factors impacting on cost estimates.

### 3.1 THE ALPURT B2 PROJECT

Conclusions the Advisory Group have drawn from the ALPURT B2 project are as follows.

It appears that the environmental enhancements incorporated in ALPURT B2 at a cost of \$65 million were in response to the risk that the Manu Waiata Restoration Protection Society (the Society) would challenge the project's compliance with the requirements of the LTMA. In response to a February 2004 letter from the Society, the Board looked for environmental enhancements to the project, which ultimately led to the inclusion of the Nukumea viaduct and Johnsons Hill tunnels. The inclusion of these features appeared to the Advisory Group to be in order to expedite the project, and ultimately resulted in a significant cost increase.

It is apparent that the decision to include the Nukumea viaduct and Johnsons Hill tunnels (and associated changes to the northern termination) was not driven by safety requirements, although the changes have allowed a safer road to be designed.

In Transit NZ governance before 2002/03, there was a strong focus on cost and economic efficiency, largely because of the need to have a BCR of 4 or more to obtain funding. For instance, the Transit NZ Board was presented a comprehensive report explaining why the cost of ALPURT B2 had increased from \$98.8 million to \$131.3 million in the revised cost estimate of March 2001. This level of rigour has not been evident since the requirement to achieve a particular BCR to receive funding has been removed. The amount of information that the Group understands was presented to the Transit NZ Board for the inclusion of enhancements, including those of an environmental nature was brief and not always particularly compelling, given the scale of costs involved.

Land Transport NZ (formerly Transfund) has the role of purchasing roading projects in New Zealand, and therefore has an approval role for funding projects. For the ALPURT B2 project, there was very little analysis of the inclusion of the Nukumea viaduct and Johnsons Hill tunnels; Land Transport NZ identified that the tunnel option had 'improved the extent of environmental mitigation' and also 'reduces the gradients of the new motorway and reduces the extent of earthworks cuts'. On the strength of this and the need for Land Transport NZ to exhibit a sense of social and environmental responsibility, Land Transport NZ concluded that 'the inclusion of the Johnsons Hill Tunnel and Nukumea eco-viaduct is consistent with Land Transport NZ objective under the LTMA 2003.' While consistent, the Board papers (including resolutions) are silent on whether Land Transport NZ viewed the changes as justified. This does not appear to have been a rigorous review for what was a costly change to the project.

From the evidence provided for the inclusion of the Nukumea viaduct and Johnson's Hill tunnels, the Advisory Group considers that the additional costs were not fully justified. While these enhancements to the project might be able to be justified on the basis of environmental mitigation, safety enhancements and improved design outcomes, the information provided does not demonstrate the robust process of evaluation of this additional expenditure by Transit NZ or Land Transport NZ that would be expected.

## History of scope change and cost estimates for ALPURT B2

The cost estimates over time for ALPURT B2 were as follows:

Year	1997	1999	2001	2004	2005
Cost \$ million	82	98	138	218	359*

\* This does not include an additional \$78 million of capitalised interest required to service the debt component of the funding for this project.

- **1999:** The scope for ALPURT B2 was established—two lanes, 80 km/hour, state highway. This scope was maintained until June 2004.
- **1999–2003:** A rigorous consent process was completed, including public hearings, appeals, Environment Court hearings, and High Court proceedings. All necessary consents were obtained by early 2003.
- **Late 2003:** ALPURT B2 moved from being 26th in national priority to having funding approved. There appears to have been a strong desire to have the project built quickly.
- **January 2004:** Transit NZ's consultants, Andel Consultants, assessed ALPURT B2 for compliance with the recently enacted LTMA. The consultants recommended no changes in scope.
- **February 2004:** A paper provided to the Transit NZ Board, indicated that appellants to the ALPURT B2 resource consents argued to have the Nukumea Stream bridged and a tunnel constructed through Johnsons Hill. For both suggestions, the paper concluded that 'this argument has been considered by the Transit Board [in October 2002] and rejected'. No decisions relating to the project's scope appear in the Board minutes.
- **March 2004:** It was reported to the Transit NZ Board that 'An existing significant risk has been brought to our attention in the last month. The Manu Waiata Restoration Protection Society (the Society) have written to the Board summarising its concerns with ALPURT B2, which are of an environmental nature. The Society have a long association with ALPURT B2 and have campaigned for much higher standards of mitigation to environmental impacts on the ALPURT B2 design than those included in the December 2003 specimen design (of B2). While the Society presents a number of arguments around legal aspects of the project and approval process, its underlying motive is to achieve higher levels of mitigation of environmental impacts.'
- **April 2004:** The Transit NZ Board noted that 'as per the Board's wishes, one of the first tasks for the Alliance [the contracting alliance building ALPURT B2] is to prepare an environmental risk register. This register will be used to assess opportunities for environmental enhancement over the current specimen design which will include, amongst other issues, an assessment of tunnelling through Johnsons Hill and bridging the Nukumea Stream.'
- **June 2004:** The Transit NZ Board was presented with 'opportunities to achieve enhanced environmental outcomes' developed by the Alliance, focusing on the Nukumea viaduct and Johnsons Hill tunnels (and related relocation of the northern termination). The Board resolved to include the Nukumea viaduct in the project scope, and to continue the investigations of the Johnsons Hill tunnels and relocated northern termination.
- Transit NZ's decisions to include the Nukumea viaduct and Johnsons Hill tunnels in the project appear to be on the basis of compliance with the LTMA. However, the January 2004 Transit Major Projects Review of ALPURT B2 for compliance with the LTMA did not identify the need for the scope change.

*Appendix 6.1 provides further detail on the changes in estimated cost that have occurred on ALPURT B2.*

### 3.2 THE VICTORIA PARK TUNNEL PROJECT

The Advisory Group has drawn the following conclusions from the Victoria Park Tunnel project.

An objective assessment of environmental effects prepared in September 2002 for Transit NZ showed that 'Option D [northbound tunnel option] retains the status quo within Victoria Park, and therefore has no significant reduction in effects compared to Option A [viaduct option]'. On this basis, there appears to be no objective reason to provide additional funds to construct Option D instead of Option A. In fact, analysis indicates that significant environmental improvement will only occur if all traffic is moved underground. However, there is currently no plan to replace the existing viaduct.

Papers presented to Land Transport NZ for the release of design funding do not appear to present the full evaluation of incremental costs and benefits for the various options. Therefore, it is difficult for the Land Transport NZ Board to make a fully informed decision about the merits of the northbound tunnel relative to the additional costs required for its construction. While at this stage, Land Transport NZ has only committed design funding, it is the general understanding of Aucklanders that a tunnel will be constructed. It would be very difficult for Land Transport NZ to resile from this position.

Transit NZ appears to be making decisions to speed up projects that have high cost implications. There does not seem to have been a systematic process to establish the scope of this project based on the assessment of environmental effects.

On the basis of the evidence provided, the opinion of the Advisory Group is that the additional costs to construct the northbound tunnel have not yet been fully justified or proven to be unavoidable.

#### History of scope change and cost estimates for Victoria Park Tunnel

Year	2001	2002	2003	2004	2005	2006
Cost \$ million	90–110	105	155	160	369.6	320

- November 2001:** The Transit NZ Board released three options for public consultation from five short-listed options. It was noted by the Transit NZ Board that Option B (new depressed roadway) and Option C (full or partial tunnel) offered no roading benefits additional to Option A (widened or new viaduct), and that it was likely that only Option A would be fully fundable.
- June 2002:** It was reported to the Transit NZ Board that preliminary feedback from key stakeholders indicated general preference for Option A. It was also reported that feedback from Auckland City Council officers indicated a tunnel was the preferred option but that it was unlikely to be funded.
- September 2002:** The Transit NZ Board was presented with a social and environmental evaluation of four options. In summary, Option B (partially covered trench) and Option C (full tunnel) offered some amenity benefits, at a cost of \$165 million to \$180 million more than Option A (widened or new viaduct). Option D (northbound tunnel) only offered modest amenity benefits, at an additional cost of \$100 million.
- November 2002:** The Transit NZ Board resolved that '...Transit cannot justify the additional costs of either a full tunnel or a northbound tunnel without local funding to meet the additional costs'.

- **December 2002:** The Auckland City Council Transport Committee resolved that:
  - Option A was unacceptable
  - the Council expected the improvements to fully mitigate the impacts of this project by trenching and tunnelling
  - funding through a combination of tolls and debt funding should be investigated.There was also pressure on Transit NZ at the time to deliver this project as soon as possible in order to realise the benefits of other major motorway projects due to be opened.
- **December 2004:** The Transit NZ Board was presented with a single option—Option D (northbound tunnel). 'While it may seem somewhat deterministic to advocate a specific approach to this transport issue, we would make it clear that we see this as a political decision'. A northbound tunnel became the preferred option, and is the basis of the project at this time.
- **April 2005:** Land Transport NZ reviewed the project and approved design funding to further evaluate the northbound tunnel option. The incremental costs and benefits of each option were not clearly presented.

*Appendix 6.2 provides further detail on the changes in estimated cost that have occurred for Victoria Park Tunnel.*

## 4.0 RELIABILITY OF ESTIMATION

The Advisory Group believe that additional investigation and research funding of proposed major projects would lead to greater certainty in estimating out-turn costs.

### 4.1 ESTIMATION PROCESS

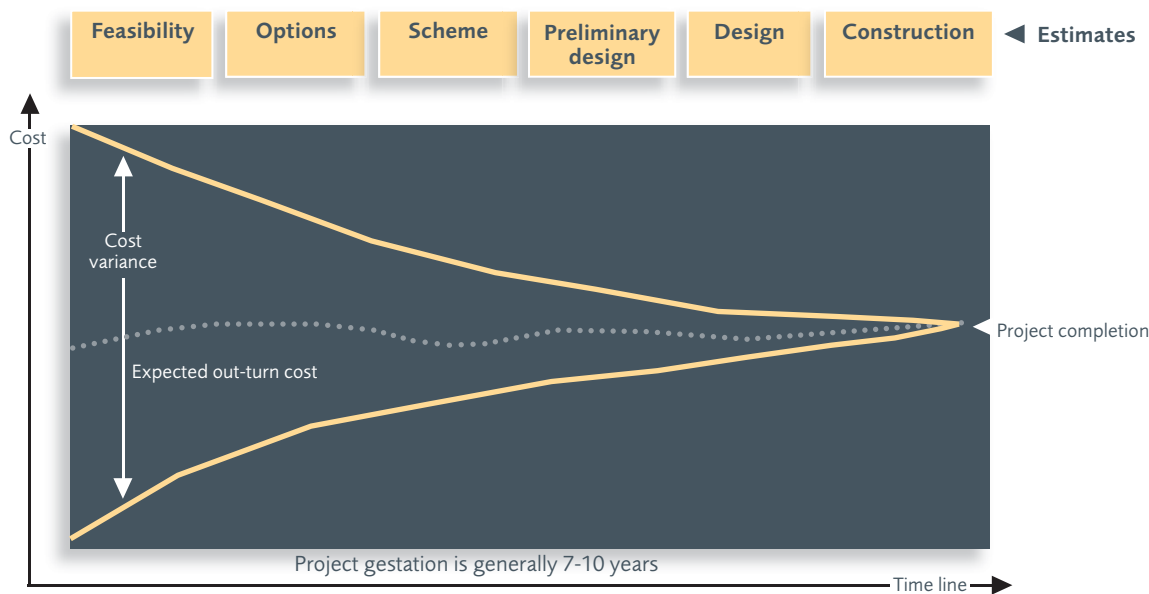
Currently, project cost is estimated according to the guidelines in the Transit NZ Estimation Manual. Estimates are completed at the various stages of a project. Table 2 shows the uncertainty in expected project out-turn cost at the various life cycle stages. Uncertainty arises from factors such as:

- project scope certainty
- understanding of geological conditions, and
- understanding of current and likely future construction pricing.

As more is known about these factors, the degree of uncertainty reduces and estimates of the out-turn cost are more reliable. Although the final construction estimate should predict the final out-turn cost of the project, the out-turn cost remains uncertain until the project is completed and all construction claims are settled.

The case study analysis of local road construction projects suggests reliability of estimation is a problem for local government as well as for Transit NZ. However, Land Transport NZ data (Appendix 7.0) shows a relatively low percentage variance between construction estimate and final out-turn cost for both Transit NZ and local road construction projects. The most significant period of uncertainty is during the earlier feasibility and options stages.

**Table 2. Statistical assessment of out-turn cost uncertainty over the project life cycle <sup>7</sup>**



<sup>7</sup> Source Transit New Zealand, Cost Estimation Manual, 2003.

As shown in section 7.0 of this report, some procurement models provide greater certainty of final out-turn cost than others, with alliancing being the most reliable model once the target out-turn cost has been agreed.

Before 2003, road design engineers carried out estimates for roading projects with varying success. Transit NZ has since taken a number of steps to improve estimation reliability, including review of design estimates by independent consultants.

Overall, the reliability of Transit NZ's estimates is improving because:

- new estimating procedures have been implemented
- there is better understanding of likely scope effects from implementing recent legislation
- older, less-reliable cost estimates have been re-estimated using new procedures
- there is greater awareness of the effect of recent input cost increases of the type referred to in section 6.0 of this report.

Despite these improvements, uncertainty of project scope, especially for complex urban projects and projects with high geological uncertainty, presents a major risk to reliably forecasting project out-turn costs. Table 1 illustrates how estimation factors have been a significant driver of recent forecast cost increases.

## 4.2 CONSISTENCY OF PROJECT REPORTING

The Advisory Group recommends that Land Transport NZ and Transit NZ review the framework for collating and reporting of cost estimates in the State Highway Forecast. This should provide consistency of information from consultant input through approval phases until forecasts are published. The Advisory Group has found it difficult to reconcile estimates from different sources for some projects. Transit NZ now has the systems to achieve more consistency in the presentation of cost escalations in State Highway Forecasts. However, uncertainty remains as to whether costs such as land, sunk costs, inflation, and debt servicing are consistently reported for some projects.

### Recommendations

The Advisory Group recommends:

- Early investigation and research for selected complex projects would lead to greater certainty of scope and estimated out-turn cost.
- Adoption of standard reporting formats for the management, consultants, and boards of both Transit NZ and Land Transport NZ as well as other users would help in understanding and comparing projects. Components of standard reports for consideration include:
  - clear identification of the different project stages; including investigation, design, and construction
  - clear identification of cost elements, such as land and resource consents
  - ability to restate previous cost estimates using the updated assumptions of the new cost estimates (This would help in comparing and identifying the causes of increases. This recommendation would be assisted by development of a costs database)
  - a common reference year to compare escalated costs, and a common format for the presentation of project history records (for example, consistent escalation rates)
  - reporting benefits in a standard format, with details of BCR and the incremental assessment of costs and benefits, as new options are presented
  - value for money indicators, such as cost per kilometre, cost per person benefiting from mitigation measures, or cost per life saved
  - identifying key assumptions and risks to forecast benefits and costs.

## 5.0 SCOPE CHANGE

Scope change has been identified as a key driver of increases in costs over the past 5 years. In the Advisory Group's definition of value for money, the scope of a project relates to the upper portion of the equation: optimal selection under the NZTS (see section 2.2). The Advisory Group investigated a number of major projects in which there had been significant cost increases (Appendix 6), to identify the changes in scope and the reasons for these, and to determine whether the changes were both justified and unavoidable. The Advisory Group also examined the way different organisations made decisions relating to scope. By analysing the reasons for these scope changes, it is possible to identify ways in which scope might be controlled in the future, particularly in relation to the major urban projects where the greatest pressures are occurring. There is a link between this section and the earlier discussion on estimation, where uncertainties regarding possible scope cause underestimation of project costs at the early stages of a project.

### 5.1 MAJOR DRIVERS: SCOPE, COST, AND TIME

Transit NZ advised the Advisory Group that the major project drivers are scope, cost, and time, with time being the major driver in recent years. There has been a focus on getting projects off the ground, particularly the difficult urban projects that have been shelved for some decades.

There has also been significant change in legislation, including the introduction of the LTMA in 2003. This new legislation has enabled a strategic approach to transport solutions, including road development, and has required outcomes that reflect the community desire for economic, social, and environmental factors to be taken into account.

In particular, severe congestion and decades of underinvestment in Auckland have led to pressure for road construction. The Government made congestion one of the key drivers in the NZTS and made additional funding available for road development in the city. Transit NZ and Land Transport NZ have therefore been in the unique situation of driving projects on the basis of getting them to construction as quickly as possible. This in turn has meant that projects such as ALPURT B2 have been constructed before they might otherwise have been, and the scope of some projects has been determined through the need to satisfy local community concerns without an extensive litigation process.

*To better understand the drivers behind these increases in project scope, the Advisory Group analysed a number of projects (see section 3).*

### 5.2 DISCUSSION OF SCOPE DRIVERS

Scope change and refinement of cost estimation are two intertwined issues during the planning and design phases of the project life cycle.

The challenge when developing estimates is to allow for all possible variables, including the planning processes, and avoidance and mitigation of adverse effects, to ensure that the approved projected budget can be maintained.

Many variables affect project scope, including the following:

- uncertainty about ground conditions
- designation and land purchase
- mitigation of social and environmental effects
- connectivity of state highway projects with the urban network
- design standards and their application
- tolling, and
- planning and funding approvals.

### 5.2.1 UNCERTAINTY ABOUT GROUND CONDITIONS

Ground conditions are always difficult to predict. If tunnelling is considered, uncertainty about cost and time for this element will usually be the greatest of all the project risks.

### 5.2.2 DESIGNATION AND LAND PURCHASE

The timing and planning for road corridor designation and purchase greatly influences the range and cost of design options and therefore project scope. Poor integration of land transport planning with land use planning often leads to inappropriate land use adjacent to road corridors. This results in the later need for extensive mitigation of road safety, noise, and visual effects. Section 6.3 discusses land purchase further.

### 5.2.3 MITIGATION OF SOCIAL AND ENVIRONMENTAL EFFECTS

The consultation requirements in land transport, resource management, and local government legislation have given communities greater opportunity to influence the nature and scope of roading projects. Mitigation costs have been a significant driver of increased project scope, particularly in the urban context.

In the future, project costs are expected to rise significantly for mitigating social and environmental effects such as:

- noise
- unwanted visual effects
- ecological impacts, and
- pollution.

Storm-water treatment is emerging as a major cost factor, especially for highway storm-water retrofits or for new roading developments. Mitigation of heritage issues will also continue to be a significant cost for a number of route options.

### 5.2.4 CONNECTIVITY OF STATE HIGHWAY PROJECTS WITH THE URBAN NETWORK

Estimating the costs of roads in the early planning stages of urban networks is difficult because of the need to integrate with utilities and accommodate other modes of transport, such as public transport, walking, and cycling. The challenge for Transit NZ is to develop at reasonable cost a road that is compatible with adjoining land uses, and that provides connectivity to the local network, while not compromising the traffic flow and overall integrity of the state highway system.

Transit NZ must serve wider regional and national transport needs, which may limit local connections. This Transit NZ objective may, however, conflict with the objectives of local authorities, who have an incentive to maximise the extent of state highways that are fully funded by the Government. Local roads by comparison must have approximately 50 percent local funding.

### 5.2.5 DESIGN STANDARDS AND THEIR APPLICATION

Design standards have not changed greatly since 2000 and thus new standards are not a large driver of recent cost increases.

*The following is a list of key technical standards and their influences on construction and maintenance costs. Further details are provided in Appendix 8.0.*

**a) Induced traffic and design speeds.** Induced traffic assumptions and design speed choices can potentially lead to high additional costs. Induced traffic is the new, longer, or shifted time of travel, primarily created by land use changes specifically related to road improvements. Choice of higher design speeds creates difficulties in adjusting the road design to accommodate terrain and the existing built environment. Design speed choices require a trade-off of both safety and travel time against increased construction costs. Transit NZ advises that systems are in place to identify appropriate induced traffic assumptions and optimise travel speeds, but the monitoring of key decisions in these areas is essential to ensure ongoing value for money.

**b) Urban design standards.** The development of urban design standards has steadily increased in recent years. The application of these standards will continue to drive construction costs. In the future, an urban design approach focused on managing land uses to minimise transport needs should be encouraged.

**c) Temporary traffic management.** Standards for temporary traffic management are detailed in a code of practice for temporary traffic management (COPPTM) that covers both construction and maintenance work. Application of this standard has led to large percentage cost increases for maintenance and construction projects because of requirements for more planning, and additional safety vehicles, staff, and other equipment for both urban and rural works.

**d) Pavements.** Increased heavy vehicle volumes require new pavement designs, such as increased use of more expensive asphaltic concrete.

**e) Safety barrier standards.** New safety barrier standards have been introduced, requiring a costly upgrade over time.

**f) Building Act.** The Building Act 2004 now covers the design and construction of bridges, culverts, and retaining walls. Seismic loading and concrete durability requirements have increased, which has led to additional costs. Compliance administration has added cost but little value.

While systems are generally in place, application of the standards above is an area that needs to be constantly reviewed to ensure that design options represent value for money.

### 5.2.6 TOLLING

The decision to toll a road should not in itself be a reason to expand scope, other than for specific tolling infrastructure. Transit NZ maintains that a toll road must be perceived by users to be of a higher quality than free routes to attract patronage. The Advisory Group does not fully concur with this view, but does agree that service functionality of a route is a key factor to attract the maximum number of users. A further consideration is that tolling a road is likely to lead to some reduction in traffic demand and that lower initial capital costs might therefore be possible. The ALPURT B2 case study in Appendix 6.1 did not sufficiently demonstrate how the tolling alternative influenced the final scope selection on this project. However, the Advisory

Group expects that scope, in terms of which technical standards and other are appropriate, will be closely monitored for future tolled routes.

### 5.2.7 PLANNING AND FUNDING APPROVALS

To achieve value for money, the Advisory Group stresses the need for agencies and local and regional councils to take a network focus in the planning and funding of roads, with clear price signals to establish appropriate cost allocation for project scope.

The case studies of major projects revealed that most have been through stop/go processes, largely because of planning consultation and funding requirements, with project scope constantly being revisited and re-litigated. This happens both during the approval processes and in some cases, such as for ALPURT B2, even after approvals have been obtained. The more iterations of a project, the more opportunities there are for the project to increase in scope and cost.

Because the major roading projects are mainly projects being developed in a complex urban context, they require complex planning and approval procedures. It is important that planning and consultation are aligned and integrated as much as possible. This requires close consultation and commitment to the project from the various agencies involved. The Advisory Group was aware that endeavours are being made to ensure that this happens, but situations such as that currently involving the finalisation of the Waterview (Avondale) project require the regional and local councils as well as Transit NZ to be committed to finding a solution that is cost-effective and meets the broader objectives. This challenge cannot be overstated.

With timely delivery being the key driver, Transit NZ and Land Transport NZ appear to have accelerated the funding consent process for scope additions for major projects such as ALPURT B2. Unfortunately, this is often at the expense of a comprehensive review of the justification for additional scope and the related cost. These agencies seem to have accepted costly recommendations for mitigation that should have been debated through the appropriate planning approval processes, because the agencies considered that the time to do this was unacceptable.

Major projects should be planned in such a way that economic, social, and environmental outcomes are planned for in the road design. However, they should also allow the time to go through an appropriate planning process. Only in this way can the agencies be assured that the resulting project is as cost-effective as possible. On the other hand, planning processes within the current framework, including the Environment Court, should also be continually improved so that they are efficient in determining outcomes within a defined time and at reasonable cost.

There is evidence that local authorities sometimes add scope to Transit NZ projects through the designation and planning approval processes and through the plan of works processes associated with the designation. Urban roading projects are often largely urban redevelopment projects and local authorities will obviously try to maximise the benefits for their community and minimise the adverse effects. The Advisory Group considers that price signals should be such as to encourage all parties to find innovative and cost-effective solutions, and where possible, to share in some of the costs of mitigation and urban enhancement associated with road projects.

There are good examples of partnership between local government and Transit NZ in the development of major inner city roading projects, such as the Wellington Inner City Bypass and Christchurch Southern Motorway extension, and for longer term network planning as in the case of the Smart Growth initiatives in Tauranga/Western Bay of Plenty.

Traditionally, the planning and funding of roading projects have been based on individual projects, rather than having a network or multimodal focus. There is a move now towards larger projects that contribute benefits to an overall network. Such projects could also provide economies of scale for road construction. It is important that the tools for evaluation of projects can take account of the network benefits. These benefits include:

- the opportunity to integrate transport and land use to moderate demand growth
- the ability to apply and benefit from travel demand management, and
- the opportunity to compare the network benefits with those of public transport.

Such an approach requires a well defined strategy, defining the outcomes required within a budget framework. Comparisons and tradeoffs can then be made between different alternatives and different projects.

### Recommendations

The Advisory Group recommends that:

- Consent and consultation processes should be streamlined and coordinated, with the involvement of local government and Transit NZ to ensure that projects can proceed to construction as quickly and as smoothly as possible.
- The manner in which costs are shared between central and local government in the mitigation of urban roading projects needs to be investigated, by examining projects where this has occurred, and
- Wherever possible, the planning and funding of roads should have a network focus.

## 5.3 STRATEGIC PROCESS GUIDING THE SCOPE OF ROAD DEVELOPMENT

The current process for planning and gaining consent for a road is particularly complex. It is the view of the Advisory Group that it is the process itself that leads to problems with scope. The Advisory Group has evaluated the strategic processes within which decisions relating to scope, and therefore value for money, are being made.

The following sections examine the strategic framework that the Advisory Group would expect to see to ensure that the desired outcomes of the NZTS and the LTMA are delivered. The Advisory Group considers that there is currently a strategic gap in the overall framework. There needs to be greater clarity of outcomes and monitoring against measurable objectives, together with strong leadership and governance to achieve these.

Efficient implementation of a project is also essential. This is covered in other sections of this report.

### 5.3.1 CURRENT ENVIRONMENT

It was apparent to the Advisory Group that the various agencies were operating within an environment of major change. (See further background to organisational and legislative changes in Appendix 4.3.) They had been required to move from a very transactional environment under the former legislation, in which a very narrow range of factors were considered in planning and evaluating roading projects, to a strategic and integrated environment, which involved a broad range of variables.

The roading projects identified as being essential to dealing with issues such as Auckland's congestion have been the difficult and expensive projects, in terms of having high costs and major community effects. Under pressure to deliver, it seems

that decision making in relation to scope and project definition has not always had the robust scrutiny that might have been expected. At the same time, community requirements can add considerable scope to a project.

Whether the resulting scope can be considered to be 'avoidable or justified' can only really be determined by evaluating the outcomes in terms of clear and quantifiable strategic objectives, which do not exist in such a form.

The systems and processes for evaluating roading projects are still evolving, with new legislation and a strategic environment, but largely old transactional processes. However, decisions still need to be made to ensure that major roading projects can be delivered on time. The Advisory Group observed that all organisations had the best intentions to deliver the outcomes required by the Government. However, there were some systemic problems, which if addressed, could help make sure that the required outcomes are delivered in the most cost-effective manner.

### 5.3.2 CLEAR VISION AND DEFINITION OF OUTCOMES

There is a gap in the existing national strategy and planning framework for land transport. To fill this gap:

- the meaning of 'value for money' must be clarified, and
- the required outcomes must be clearly identified in enough detail to be able to measure achievement towards them.

The NZTS outlines the Government's vision for a sustainable transport system in New Zealand. The intention of the NZTS is outlined in Appendix 4.3.2. Affordability is a key part of the vision statement. The NLTP, the 10 Year State Highway Plan and Forecast, and Regional Land Transport Strategies give effect to the NZTS.

The NZTS is a very high-level strategic document, which is being interpreted by transport agencies and local government to deliver roading outcomes. The delivery agencies are making their own interpretations of the intention of the strategy and of the legislation, often at a detailed project level. This project-focussed and 'bottom-up' approach will not necessarily deliver the most cost-effective outcomes from a national perspective.

There are strategic projects underway to address the strategic gaps around land transport and roading:

- The Ministry is developing a methodology and indicators to measure the achievement of outcomes across the sector; and
- Transit NZ is currently preparing a National Roding Strategy, in the absence of such a strategy being provided by other authorities.

Such initiatives need to reflect the broader national economic, social, and environmental objectives as well as the higher level objectives of the whole transport sector. However, to be meaningful to individual agencies, there needs to be an interpretation of these objectives into more detailed outcomes and outputs. The Advisory Group is not aware of any initiative that will address this concern.

The development of a national strategy, possibly a National Land Transport Strategy (NLTS) as provided for in Part 13 of the Land Transport Act 1998, could provide the necessary interpretation required from Government. An NLTS would have an overarching effect on the Regional Land Transport Strategies and would have links to other national strategies and national policy statements.

A detailed national strategy would enable the desired government multimodal outcomes to be clearly defined and balanced against the regional outcomes as defined in the Regional Land Transport Strategies. These strategies, which Regional Land

Transport Committees have been required by Government to prepare, are much more rigorous in process and more detailed than the NZTS; developed with public consultation; and currently the basis for most roading priorities.

A more detailed roading strategy is also required. Any national roading strategy should reflect broader national objectives, as well as the higher level objectives of the whole transport sector. Ideally, it should guide:

- what projects to build
- where to build them
- when to build them
- broad standards for design and construction, and
- the process for establishing an appropriate budget relative to the project's benefits.

For example, the strategy being developed by Transit NZ takes account of the need to serve major ports and airports; to conserve areas such as the Karangahake Gorge on State Highway 2; and to develop alternative routes such as that over the Kaimai Ranges. Such a strategy should also provide guidance for road funding and land purchase.

In the absence of an overarching land transport strategy, Transit NZ's roading strategy will provide guidance for roading, but will not have the benefits of a more comprehensive strategic framework.

The Advisory Group looked offshore for examples of a strategy and planning system for roading that could provide an improved process for New Zealand in the future. The South East Queensland Infrastructure Plan and Program 2006–2026, published in May 2006, was prepared by the Queensland Government in partnership with local governments in the region. The plan focuses on the long-term planning of infrastructure in South East Queensland, of which transport infrastructure is a significant component. A business case for each project is approved by the Queensland Government. It would be possible to modify this approach to suit the New Zealand context.

With the many various strategy and planning documents already in place at national, regional, and local levels it is important to ensure that they, and any new strategies or processes, work together as well as possible within the existing legal framework. The sharing of information and data between these processes was identified by the Advisory Group as one way the strategy and planning processes could be improved.

## Recommendations

The Advisory Group recommends that:

- The strategic gap between the NZTS and the existing strategy and planning processes is filled. To do this, the focus will need to be on providing more detailed national objectives against which roading proposals can be evaluated
- The possibility of using the NLTS provisions contained in the Land Transport Act is investigated
- The South East Queensland Infrastructure Plan and Program 2006–2026 is looked at as an example of an integrated plan involving all central and local government agencies associated with transport infrastructure
- Support is given to Transit NZ and Land Transport NZ to develop a National Roding Strategy to prioritise roading outcomes, to provide guidance on funding, and to assist in strategic land purchase. The focus will need to be on delivering networks, and not segments of the network, in accordance with the NLTS, and
- Agencies that develop land strategies and plans share information wherever possible to ensure consistency.

### 5.3.3 DEFINE MEASURABLE OBJECTIVES

The Advisory Group recommends that value for money objectives and performance measures form a key part of the statements of intent (SOIs) for the Ministry of Transport, Transit NZ, and Land Transport NZ. Measurement will better ensure that required outcomes are achieved within the prescribed time and cost framework.

The SOIs are the key documents for ensuring that the Government's outcomes for roading are delivered. These are linked to the strategies in place for the sector. Value for money objectives need to be clearly set out in these documents and progress against them monitored.

Value for money was not identified as a key objective in any of the SOIs for the Ministry of Transport, Transit NZ, and Land Transport NZ in the year ending June 2006. Therefore, the agencies did not report on value for money. The contents of the SOIs are summarised in Appendix 9.0

The Ministry's SOI indicates that it is working with Crown entities to design a monitoring and indicators framework. However, development of these performance measures will require a more detailed strategy. The performance measures should also include indicators of value for money.

#### Recommendations

The Advisory Group:

- Supports the Ministry's review of accountability and performance monitoring with Transit NZ and Land Transport NZ, within a strategic framework, and
- Proposes that performance indicators should include value for money indicators.

### 5.3.4 CLEAR ROLES AND RESPONSIBILITIES

Each organisation involved in transport strategy, planning, and delivery has a collaborative role to play in ensuring value for money. There are opportunities for roles to be enhanced to ensure that each is able to play its part in delivering a seamless whole.

Road network development involves a multitude of organisations and it is essential that there are clear roles, responsibilities, and accountabilities for each of these organisations. Appendix 4.3.1 outlines the roles as currently defined for each organisation.

#### Ministry of Transport

The Ministry of Transport is responsible for the NZTS and for transport policy. Clear policy guidelines are required for interpretation of the legislation into practice. These guidelines will help the organisations balance the scope creep with the cost implications for each project. At this stage, such guidelines have not been put in place.

There would be benefit in the Ministry of Transport taking a greater collaborative and supportive leadership role.

### Land Transport NZ

Land Transport NZ has the role of allocating funding. Because much of the funding is pre-assigned to different categories of expenditure and projects, this role has diminished over the past few years.

Land Transport NZ also audits roading projects and requires reports against expenditure from Transit NZ and local government.

The Advisory Group sees that Land Transport NZ has a role as an intelligent purchaser to deliver strategic outcomes. Land Transport NZ needs to play a clearer role in the strategic process and in funding to achieve outcomes as well as to oversee project scope. Where there is an increase in project scope, Land Transport NZ needs to be satisfied that projects are still delivering value for money.

### Transit NZ

Transit NZ is tasked with planning, delivering, maintaining, and operating New Zealand's state highway system. Transit NZ's responsibilities and accountabilities need to include partnership with the other transport authorities. It is recommended that cost and value for money also become major drivers of performance.

### Local government

Local government is required by legislation to develop a rigorous strategic framework that identifies local and regional priorities. Regional Land Transport Committees have extensive representation by a multitude of organisations with an interest in the transport infrastructure of the region. The resultant strategies tend to dictate the regional priorities for roading projects. Because of the representative nature of the Regional Land Transport Committees, these priorities are not necessarily based on robust evaluation of alternatives and the advantages and disadvantages of each. The political make-up of the committees can influence the priorities. The Advisory Group recommends that regional priorities should be based on robust prioritisation criteria complementary to the prioritisation process being recommended nationally.

## Recommendations

The Advisory Group recommends that:

- The Ministry, Land Transport NZ, and Transit NZ give greater effect to their roles—in particular:
  - the Ministry in policy leadership
  - Land Transport NZ as an intelligent purchaser, and
  - Transit NZ in the development of strategic leadership with road-controlling authorities and the industry in general
- Demonstration of agency collaboration and value for money should be considered as key performance indicators
- Where appropriate, Memoranda of Understanding are developed between transport agencies and local government to achieve collaboration and define behaviours and processes, and
- Regional priorities are determined through robust prioritisation criteria complementary to the prioritisation process being recommended nationally.

### 5.3.5 A ROBUST FUNDING ALLOCATION AND EVALUATION FRAMEWORK

The Advisory Group believes that strengthening Land Transport NZ's evaluation role and having a more sophisticated evaluation system is required if the Government is to be assured of value for money in road provision under the new legislation.

Land Transport NZ has developed a process for funding allocation that takes account of the NZTS and the requirements placed on the authority under the LTMA. The process by which Land Transport NZ allocates funds is in Appendix 10.0.

The manner in which Land Transport NZ is involved in overall project decisions, where major scope change and cost are involved, should be reviewed. Land Transport NZ's ability to control the assignment of project funding for major projects and ensure value for money has reduced. The recent move toward funding categories and committed funding for Transit NZ and for the regions has limited Land Transport NZ's oversight of the funding process. The Victoria Park tunnel project demonstrated the problems for Transit NZ of being 'at the end of the funding chain'. Land Transport NZ has funded only the investigation of a tunnel, but this tunnel is already considered by the Auckland public to be an inherent part of the project. The trend for funding of larger projects to have to meet a broader range of economic, environmental, and social objectives has made it more difficult for Land Transport NZ to effectively challenge scope.

It was also noted that if Transit NZ proposes borrowing, such as for ALPURT B2, they are not ultimately able to cover their risks in this area. The risks are essentially underwritten by Land Transport NZ.

An improved framework to evaluate the broad range of factors involved with sustainable outcomes is required if the Government is to be assured of value for money. Ideally, funding evaluation needs to focus on the ability of a project to deliver on the national strategic objectives. At present, these objectives for the NZTS are very high level and the responding evaluation systems used by Land Transport NZ are therefore high level.

After the LTMA was enacted, Transfund adopted a multi-objective evaluation procedure for their allocation process. This procedure was similar to that developed in the United Kingdom for making decisions about transport investment. The process and evaluation factors used by Transfund received a favourable peer review by the Traffic Research Laboratory from the United Kingdom on the basis that the process would continue to be developed. This is the basis of the process still used by Land Transport NZ. It was originally envisaged that:

- the inevitable degree of subjectivity in the allocation process would be supported by quantified evidence, that
- well-defined 'core' information for a proposal would be provided by promoters, and that
- a proposal could be presented on one or two pages in an appraisal summary table so proposals could be compared.

In the system currently used by Land Transport NZ, applicants apply a high-, medium-, or low-impact rating to evaluation factors, but this system is not supported by a quantified, structured, and consistent assessment of these factors. There is also a case for extending the consideration of economic benefits to take account of long-term economic sustainability and real economic benefits.

The Advisory Group believes the current system used by Land Transport NZ can be improved. It is recognised however that a return to a simple BCR approach would not be satisfactory in terms of the wider NZTS objectives and LTMA requirements.

Although a more comprehensive evaluation process is needed for larger roading projects, the process could be streamlined for smaller projects. Most local government projects are on a small scale and have already been through a complex process of justification in a similar framework.

### Recommendations

The Advisory Group recommends that Land Transport NZ:

- Investigates enhancements to its evaluation system to enable better comparison of projects and to allow evaluation of individual project expenditure within a national context
- Reviews its processes for the ongoing evaluation of major Transit NZ projects through the design and construction phase to ensure that they are delivering value for money
- Considers a more streamlined evaluation process for smaller projects, and
- Is more involved in the early stages of project decision making where major scope change and cost are involved.

#### 5.3.6 CLEAR INCENTIVES AND PRICE SIGNALS

Clear incentives and price signals are needed to ensure that projects are completed efficiently and cost-effectively. Because State highways are funded entirely by Land Transport NZ, there is a natural inclination for local authorities and their communities to maximise both roading and non-roading benefits, and to maximise the 'mitigation'<sup>8</sup> of state highway projects. The pressure for Transit NZ to deliver projects quickly, while going through extensive community consultation and regulatory processes, leaves Transit NZ in a weak negotiating position. The stop/go environment that has been a feature of this sector enables the re-litigation of decisions around project scope. In turn, the change in project evaluation criteria away from solely using BCR means that Transit NZ has less incentive to contain project costs.

The Advisory Group therefore recommends that there is investigation of how clear pricing signals can be given to all parties involved in project planning. The communities gaining the benefits and bearing the costs of roading projects should be aware of the cost implications of proposals. Ideally these communities should also share in the costs of the project enough to control expectations and to foster innovative solutions to problems. All parties need to share accountability for projects within a discipline of always seeking the best outcomes at reasonable cost. This might be best achieved, for example, in an environment in which 'savings' from a project are able to be reinvested in the region.

Approvals for major projects should be streamlined as much as possible. Negotiated solutions are ideal for timely delivery of projects. However, careful judgement is required when making decisions and undertakings around scope in order to avoid the formal planning process. There is a need to test mitigation measures against materiality and affordability constraints. Perhaps in some circumstances, costs could be reduced by resolution through the court process.

### Recommendation

The Advisory Group recommends that there is an investigation of how the cost implications of different options can be given to all parties involved in project planning, with some sharing of responsibilities for costs, so that parties are encouraged to work together to get the most cost-effective solution.

<sup>8</sup> Mitigation might include sound or visual barriers, low-noise asphalt or even tunnelling.

### 5.3.7 ROBUST MONITORING AND REVIEW

Cost-effective delivery of projects can only be achieved in an environment in which there is robust monitoring and review. This should monitor both performance indicators and achievement of specific outcomes, including aspects such as inter-agency relationships.

The Ministry of Transport undertakes some monitoring through quarterly reports and SOIs for the transport entities. This could be more comprehensive.

Land Transport NZ then monitors the NLTP by assisting and advising the approved agencies in monitoring tools, selective performance monitoring, monitoring of strategic programme effectiveness, and auditing and monitoring individual packages.

#### Recommendation

The Advisory Group recommends that the Ministry of Transport undertakes more comprehensive monitoring of Crown transport entities.

### 5.3.8 GOVERNANCE AND LEADERSHIP

Coordinated and aligned leadership of all organisations is required to successfully develop and maintain roads in an environment in which there are multiple players (including the private sector). The organisations need to align their objectives and policy guidelines, and share information. This requires a collaborative, open, and supportive environment, underpinned by good process. Organisations need to communicate in an environment of mutual respect. Memoranda of understanding would assist in defining behaviours and processes by which the different entities interact and make decisions.

The Advisory Group observed that boards of the Crown transport entities were doing their best to deliver on demanding outcomes in a changed strategic and legislative environment. The achievements of the past 5 years are notable in terms of getting major projects initiated and under construction, particularly in Auckland. It was noted, however, that there should be more consistency in the robustness of reporting and evaluation required by the boards. Some major Auckland projects such as ALPURT B2 seem to have escaped the close scrutiny of costs and consideration of value for money that might have been anticipated.

Given the increasingly complex environment in which the transport agencies are operating, it is considered appropriate that a review is undertaken of the competencies required of the respective boards, including the appropriateness of dual membership of the Land Transport NZ and Transit NZ Boards.

The Ministry of Transport needs to provide a supportive strategy and policy environment for these boards, translating high-level strategy and government requirements into clear objectives that are reflected in the SOIs.

## Recommendations

The Advisory Group recommends that:

- There is a focus on developing a collaborative and aligned leadership environment between the transport entities and the Ministry
- Appropriate Memoranda of Understanding are developed to assist in defining the behaviours and processes by which the different entities interact and make decisions, and
- A review is undertaken of the skills and experience required at board level for the Crown transport entities, particularly to ensure that sufficient commercial expertise is present, and to determine whether dual membership of the Land Transport NZ and Transit NZ Boards is still appropriate.

## 6.0 INPUT COSTS

The Advisory Group considers that the large increases in input costs over the past 5 years have been unavoidable and input cost pressures will continue at least in the medium term. The level of competition at some points of the supply chain is not ideal, but overall the level of competition is satisfactory. While capacity constraints, particularly in the buoyant Auckland market, have driven project input costs by 30 to 40 percent, main contractor margins have contributed increases of only 2 percent to the total cost of projects.

### 6.1 ECONOMIC CONTEXT

Economic advice to the Advisory Group<sup>9</sup> indicates that local input-cost increases are the consequence of expansion, which over time will increase productivity in construction and the economy. Increases in resource prices (of labour and construction) are considered a consequence of the normal operation of a supply curve in a market. If a player in the market requires more construction capacity and labour, it must pay a price to bid that capacity and labour away from another use or employment.

In the 1980s and 1990s, investment in New Zealand was below sustainable levels. In the past 4 years, New Zealand has been lifting its rate of investment across all sectors including roading (see Appendix 4.1). Many of the recent changes in the local components of input costs are a result of this change in growth. They are a cost of growth that will expand future capacity. Over time these changes will increase productivity in construction. Costs are then expected to moderate at the new, higher and sustainable level.

If future work flows are less certain however, the road construction sector might not be able to make the structural changes necessary to increase production in New Zealand.

### 6.2 INPUT COSTS—CONSTRUCTION

Rises in road construction input costs in the past 5 years have resulted in overall project cost increases in the range of 30 to 40 percent. Increases have been generally higher in Auckland than in other regions. International competition for key resources such as fuel, steel, and skilled staff has been an uncontrollable factor that is likely to continue as a significant influence on input costs in the foreseeable future.

The input cost increases are largely considered a consequence of expansion of the sector after more than a decade of low capital investment. The sector has moved from a subsistence mode to a growth mode, which, providing there is continued certainty of work, will result over time in increased productivity and capacity through increased investment in capital and human resources.

The Advisory Group commissioned road construction cost information for the Auckland region from Bond Construction Management Ltd, which is summarised in Table 3.<sup>10</sup> The reason for focusing on cost increases in the Auckland area is that cost pressures here are considered to be greatest.<sup>11</sup> 48 percent of Transit NZ's large capital projects over the period 2006–2015 will be located in this region.

<sup>9</sup> National and International Macroeconomic Factors and Roading Cost Increases, Report by Business and Economic Research Ltd (BERL) to The Ministerial Advisory Group on Roading Costs, June 2006. See summary in Appendix 11.0.

<sup>10</sup> Bond Construction Management Ltd, Report to Transit New Zealand and the Ministerial Advisory Group on Roading Costs, 'Influences on Road Construction Cost Increases', 19 June 2006.

<sup>11</sup> Bond Construction Management Ltd, *ibid*, p25, provides benchmarks of input costs for Waikato/Bay of Plenty, Wellington, and Christchurch against Auckland. Cost increases across a range of inputs vary from 75 to 95 percent of the Auckland increase.

Table 3 shows that the top six input cost increases in order of their weighted impact on road construction costs over the 5 years from 2001 to 2006 are:

- fuel, 6.5 percent
- hourly labour, 6.1 percent
- aggregate, 4.0 percent
- salaried staff, 2.8 percent
- plant, 2.2 percent, and
- contractors' margins, 2.0 percent.

Table 3 also shows that overall input cost increases totalled approximately 30 percent<sup>12</sup> from 2001 to 2006 in the Auckland market. While some input costs have increased significantly, their effect on the overall cost of a typical roading project may not be material. Concrete pipe costs, for example, have increased 54 percent from 2001 to 2006, but account for only 1.35 percent of road-construction cost increases in Auckland. Other more difficult to quantify elements of input cost change are included in section (b) of Table 3. These factors could have added a further 12.5 percent to project costs. The cost increase data is based on a 'typical' Transit NZ project. The weighting of project inputs will vary significantly between projects. For example, an earth works project will have much higher plant and fuel components than a project consisting primarily of concrete structures. Input costs in this table are calculated from an average of projects, excluding those with a predominance of structures.<sup>13</sup>

<sup>12</sup> Nominal increase includes inflation. Calculation of real increases needs to allow for inflation of about 15 percent over the 5-year period June 2001–June 2006. Statistics New Zealand, Consumer Price Index movement for 'All Groups'.

<sup>13</sup> Bond Construction Management Ltd, *ibid*, p32.

**Table 3. Summary of impact of input-cost increases on road construction costs 2001–2006 in the Auckland region**

Components of Transit NZ supply chain		5-year input-cost increase 2001–2006 (%)	Input percentage of typical project cost (%)	Weighted impact on road construction cost (%)
<i>a) Input costs</i>				
Steel products	Reinforcing steel	40.0	3–4	1.4
Concrete products	Concrete*	13.5	6–9*	1.1
	Concrete pipes	54.0	2–3	1.4
Asphalt and fuel	Bitumen	23.0	3–6	1.0
	Diesel and petrol	100.0	6–7	6.5
Aggregate	Quarry products	18.0–50.0	5–15	4.0
Other materials	Other material	13.4	7–15	1.5
Direct plant	Construction plant, equipment, and vehicles	10.0–15.0	16–20	2.2
Labour and staff	Hourly labour	35.0	15–20	6.1
	Salaried staff	35.0	5–10	2.8
	Contractors' margins	22.0	8–14	2.0
<b>Total input costs</b>				<b>30.0</b>
* Note: Concrete's 6 to 9 percent total share of the supply chain is made up of a 3 to 4 percent contribution to general road construction costs and the concrete consumption of pre-cast elements contributing 4 to 5 percent to road projects.				
<i>b) Other cost factors</i>				
<b>Legislative change</b> (includes Holidays Act 2003, Resource Management Act 1991, Building Act 2004, Health and Safety in Employment Act 1992, LTMA, and Local Government Acts)				4.0
<b>Technical standards and project management compliance</b> (includes seismic requirements, safety barriers, bridge manual, urban design, tendering, and Transit NZ's own costs)				5.5
<b>Labour productivity</b>				3.0
<b>Total other</b>				<b>12.5</b>
<b>Total input and other</b>				<b>42.5</b>

While fuel prices have increased by 100 percent over the past 5 years, these prices are internationally driven and largely unavoidable.

Hourly labour, salaried staff, aggregate and plant costs have all moved at rates higher than inflation, but this is considered a justifiable cost of expansion of the sector at a time of increased investment, as discussed in section 6.1.

Buoyant markets, rather than a fundamental lack of competition, are considered to be responsible for the contractors' margin in recent cost increases. 'Contractors' margins' are defined as corporate overhead plus profit. They currently make up about 8 to 14 percent of road construction input costs and have increased by 22 percent in the 5-year period since 2001 when margins were in the range 6 to 12 percent.<sup>14</sup> In recent years, Transit NZ has transferred more risk onto contractors than previously. Risk transfer to the party best able to manage the risk is justified, but this may come at the price of increased margins.

Input cost increases in the next year for fuel are difficult to predict. Contractors' margins are not expected to increase in the coming year. All other input costs are expected to increase in the next year at largely similar rates to those seen in recent years.

*Refer to Appendix 12.1 for further detail on input cost increases.*

In addition to the input cost factors already mentioned, the report by Bond Construction Management Ltd also notes further input-cost increases arising from the following influences:

- Legislative changes and compliance
- Change of technical standards
- Increased traffic management and stakeholder management
- Reduced labour productivity in a buoyant market, and
- Demand for professional services

As indicated in Table 3, the cumulative effect of these additional cost influences might have increased project costs overall by at least a further 10 percent.

### 6.3 INPUT COSTS—LAND

The Advisory Group was not able to conclude a case for significantly earlier purchase of land than is currently the practice. The Advisory Group supports existing Transit NZ initiatives to improve land purchase processes for urban projects, which may include extending purchase to a 5-year lead time for some projects.

Transit NZ land costs increased significantly in the early 2000s, peaking in 2002, and they remain high in preparation for major urban Auckland-based projects (see Appendix 13.1 for details). The average annual increase in the median sale price for dwellings was 15 percent over the 5-year period from June 2001 to June 2006 in the Auckland district, where the majority of road construction activity has been located. This compares with an average annual increase of 4 percent for the previous 5-year period (see Appendix 13.2).

<sup>14</sup>The source of information on the 22 percent contractors' margins increase in 2001-2006 and contractors' margins 8-14 percent share of supply chain is a personal communication between David Stimpson and Ian Bond, 7 August 2006.

A tendency towards wider road corridors to allow space for mitigation of noise or landscape effects, or greater flexibility for design variations has driven up costs. Narrow corridor width has been a problem in projects designated some time ago and may also have pushed up construction costs.

Transit NZ's current land purchasing strategy is to buy no earlier than necessary after designation is complete, without causing project delays. The aim is to secure land 3 years before construction starts. 80 percent of purchases are made on a willing buyer/willing seller basis, and 10 percent are made using the compulsory purchase provisions of the Public Works Act 1981. The other 10 percent is made prior to formal initiation of purchasing procedures where an opportunity exists to either secure a key strategic land holding or avoid designation challenges where price is the key issue, or where hardship can be demonstrated. Market value is paid in all cases, less any value increase attributable to the road project.

A land purchase management and modelling system is being implemented to assist land purchase in complex urban environments.

It is understood that Transit NZ is already exploring options to extend advanced purchasing to 5 years prior to construction using Transit NZ's authority to borrow. The net benefits of earlier property purchase are not clear, as there are a number of constraints, costs, and benefits. The potential benefits include:

- reduced risk of construction delay
- clarity of strategic intent to the local community and some ability to directly control inappropriate land use, and
- potential reduction in cost if land can be purchased at a relatively low point in real-estate valuation cycles, assuming capital gains will exceed Transit NZ's opportunity costs of holding the land.

Potential constraints and costs include:

- overinvestment of limited national funds on projects where the benefits are some years away
- ability to correctly forecast the scope of a project at an early stage with the risk of investment in the wrong place relative to the final chosen option.
- ability to secure a designation over the target route also cannot be guaranteed
- negative economic impacts if land and businesses are taken out of production earlier than is necessary, and
- difficulties in selecting beneficial investment points in the property cycle and where land-holding opportunity costs exceed capital gains.

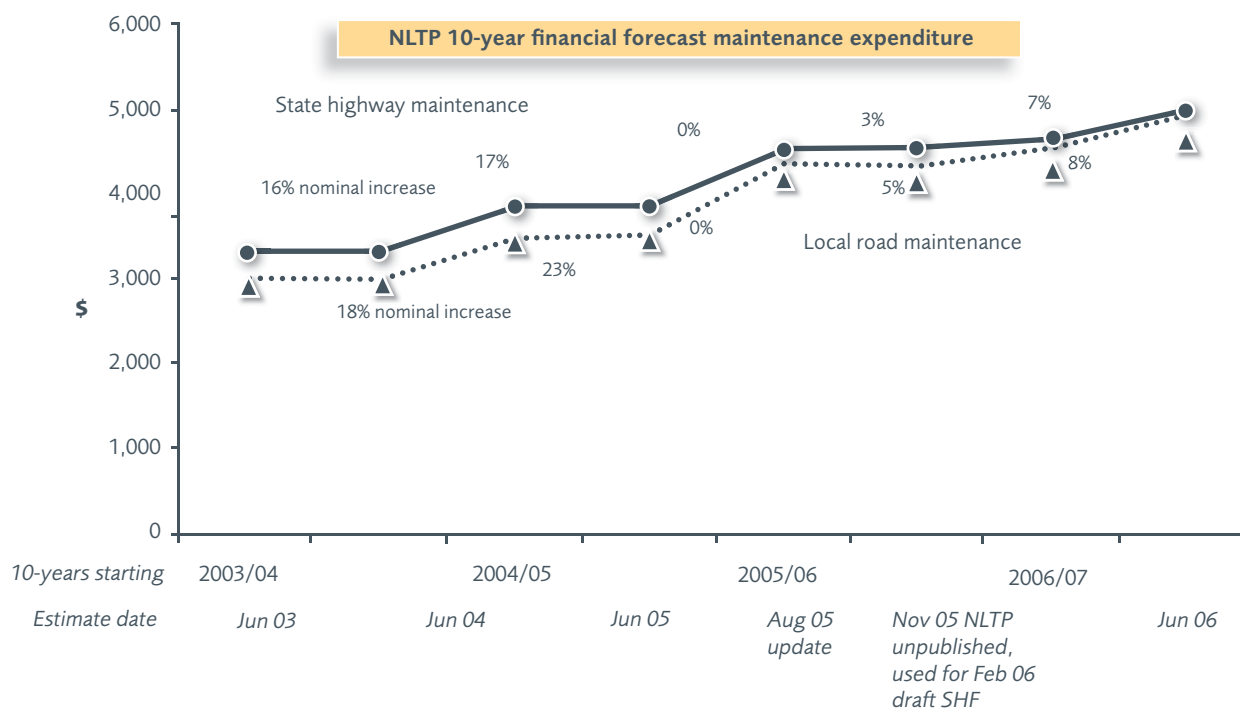
#### 6.4 INPUT COSTS—MAINTENANCE

Road maintenance cost increases over the past 5 years for both State highways and local roads, while above inflation levels, are largely justified considering the high growth in heavy commercial vehicles and input-cost increases arising from the current buoyant market. In some rural regions, unit-rate increases have been modest, to the extent that sustainability of margins for contractors could be a concern.

Annual maintenance expenditure for both State highways and local roads has increased by an average annual rate of 9 percent over the 4-year period 2001/02 to 2005/06 (details are contained in Appendix 14.1). These increases are strongly related to growth in heavy commercial vehicles, which has averaged about 4.5 percent each year over the same period (see Appendix 14.2).

Forecasts of 10-year maintenance expenditure for both State highways and local roads in Chart 2 show significant real increases above expected inflation since 2003/04. The increase in forecast maintenance expenditure has been about 50 percent compared with expected inflation of about 12 percent over the same 4-year period.

**Chart 2. National Land Transport Programme 10-year forecast maintenance expenditure 2003/04 to 2006/07**



The main drivers of forecast maintenance cost increases for both state highway and local roads include:

- increased costs from forecast growth in heavy vehicle traffic
- increased input costs and higher standards specification assumptions for some work
- increased requirements for safety—for example, higher pavement surface standards
- increased temporary traffic management standards for maintenance activities requiring, for example, more signage, safety vehicles, and staff
- traffic demand management in highly trafficked networks; this includes the operation of traffic management systems such as ramp meters
- increased requirements for night working in urban areas to minimise traffic disruption costs, and
- corridor maintenance requirements.

Unit rates for area-wide pavement treatment have increased significantly in recent years because of input cost increases and the specification of higher cost asphaltic concrete pavements for noise, safety, and durability reasons. State highway area-wide pavement treatment has climbed from about \$18 million in 2000/01 (6 percent of the state highway maintenance budget) to almost \$40 million (12 percent of the state highway maintenance budget).<sup>15</sup> Unit-rate increases for other work have tended to be at about and in some cases below inflation levels. Given recent cost increases for fuel, bitumen, and labour, current rates for some work other than area-wide pavement treatment may be unsustainable in many regions. Further details on unit-rate increases for the period 2000–2005 are contained in Appendix 14.3. Unit-rate cost increases are generally an urban and State highway issue, with local rural roads appearing to have reasonably stable prices.

<sup>15</sup> National Roading Maintenance Cost Overview, Opus International Ltd, June 2006, p34.

#### 6.4.1 FUTURE MAINTENANCE COST INCREASE RISKS FOR STATE HIGHWAYS AND LOCAL ROADS

The risk of large, unforeseen increases in road maintenance costs for both State highways and local roads is generally low.

Transit NZ State highway national modelling analysis indicates that service levels over the next 10 years will be maintained or improved. Cost increases are largely driven by traffic growth. Cost risks for Transit NZ are mainly related to potential demands for higher standard surfaces to meet safety and noise expectations.

All local authorities have asset management plans supporting 10-year maintenance forecasts; however, only 25 percent undertake detailed modelling of pavement deterioration. The Advisory Group has considered an issue raised by one council that a significant number of road pavements constructed in the 1960s and 1970s are nearing the end of their design lives, which might pose a risk of widespread unforecast pavement failures for some councils without pavement deterioration modelling. The risk on a national scale, however, is not significant for two reasons:

- Rapid pavement deterioration is more a result of increased heavy traffic than age, and
- Councils not conducting modelling tend to have low traffic densities.

Nationwide, the estimation uncertainty is therefore not a significant risk for NLTP maintenance budgets. However, if sudden increases in maintenance expenditure occur, this would have significant local share<sup>16</sup> affordability impacts for individual smaller rural councils where roading is the largest budget item.

One other emerging issue is that the cost of oil and therefore bitumen has put significant pressure on some territorial local authority maintenance budgets. There is evidence from some councils that outputs are therefore being reduced so these price increases can be absorbed within the available budget for road maintenance. If this trend continues, it will lead to a build-up of deferred maintenance, the significance of which depends on the specific circumstances facing each council.

#### 6.5 COMPETITIVENESS

Overall, competition levels for both road construction and maintenance are less than ideal, although there is no evidence that this in itself is a major factor driving increased input costs. Capacity constraints in a buoyant market, rather than a fundamental lack of competition, are considered to be the more important driver of recent cost increases. While there are examples of low levels of contestability for contracts in the East Coast of the North Island and some parts of the South Island, overall competition is considered to be adequate in the roading sector.

Transit NZ and local government should be encouraged to use their countervailing power as major purchasers of roading services, where reasonable and necessary, to overcome supply barriers and ensure adequate competition for its contracts.

Analysis of the adequacy of competition in the roading market needs to assess a number of factors including:

- the number of competitors
- the power of the buyer and seller, and
- barriers to entry for new competitors.

The number of competitors in the road construction and maintenance sector has declined to less than ideal levels in recent years. As experienced in other countries,<sup>17</sup> the New Zealand construction sector has undergone consolidation and mergers of entities

<sup>16</sup> Land Transport NZ funding requires a local share contribution to capital and maintenance work. This Financial Assistance Rate varies between councils but averages about 50 percent.

<sup>17</sup> For example, Washington State construction industry consolidation: Measures, Markets and Mileposts, Washington State Department of Transportation, 31 December 2005.

along the supply chain ('vertical integration'). In addition, suppliers have developed increasing power in the construction market in Auckland and other high-growth areas. The evidence for this are the many instances where Transit NZ and local government have failed to get a minimum of three tenders for construction and maintenance projects (refer to Appendix 12.5).

Given the prediction that construction and maintenance volumes will remain high in the medium term, capacity constraints will continue and the numbers of bidders will remain limited unless potential new entrants can be convinced there is an attractive and durable (long-term) market.

Transit NZ and some larger local authorities are the dominant purchasers of road works, and this provides a degree of countervailing power over suppliers. For example, in some localities, quarry ownership provides a significant competitive advantage for some contractors in the bidding of construction and maintenance contracts. If the barrier to entry is too high for new quarry entrants in such cases, Transit NZ can enter into purchase contracts with quarry owners for key materials, and supply these direct to the successful tenderer. The Advisory Group supports Transit NZ's early thinking in this respect as part of its Value for Money project.

#### 6.5.1 NUMBER OF COMPETITORS—MAINTENANCE AND CONSTRUCTION

An essential part of managing growing construction costs is to encourage a competitive bidding environment—the more qualified bidders the better. The preferred minimum number of bids for any particular contract is subject to a number of considerations including:

- type of contract (for example, major design/construct)
- ability for the owner to manage the selection process
- need for specialist contractor skills and experience, and
- financial strength.

In New Zealand, three bidders would normally be considered a minimum, whereas more than five or six bidders can provide a disincentive for competitors to bid. Land Transport NZ data (see Appendix 12.5) indicates that across Transit NZ and local authority maintenance and construction contracts, the average number of bidders has fallen from more than four before 2000 to a little less than three in 2005. Roading New Zealand advises that the current average bid rate remains at about three, which is in close agreement with Land Transport NZ records. There is no indication that this average will reduce in the medium term.

Contestability is low (particularly for the smaller contracts) on the East Coast of the North Island and parts of the South Island. It is noted also that for pavements and reseals, there is low contestability in a number of areas.

#### 6.5.2 MAINTENANCE SECTOR

Despite the declining levels of contestability noted above, maintenance cost data indicates that unit rates for reseals<sup>18</sup> have been in line with inflation since 2000 in rural areas. Local road rehabilitation (area-wide pavement treatment) unit rates have also been stable since 2000 in South Island rural areas.<sup>19</sup> The Advisory Group has seen no evidence that the reduced number of bidders has increased costs to the maintenance sector.

Transit NZ advises that longer term (5- and 10-year) maintenance contracts are strongly contested by the bidding parties despite the limited competition.

<sup>18</sup> Opus International Ltd, *ibid*, p18.

<sup>19</sup> Opus International Ltd, *ibid*, p23.

Fulton Hogan and Works Infrastructure currently dominate contracting in the maintenance sector. Each has a national presence and significant supply-chain integration with regional variations. These contractors have invested heavily in plant and equipment, systems, and people in recent years and have developed considerable in-house knowledge of road asset management, which is of real value to Transit NZ. Other contractors such as Higgins Group and HEB Smithbridge are developing capability, and the roading agencies should ensure that barriers to entry are minimised for new entrants who exhibit the appropriate expertise and professional approach.

### 6.5.3 CONSTRUCTION SECTOR

The Advisory Group considers the availability of a minimum of five road construction main contractors with the capability of carrying out large and complex projects would be sufficient competition for the New Zealand market. The continued development of emerging companies will better ensure the industry will have sufficient capacity.<sup>20</sup>

For major State highway contracts, Transit NZ has a choice of up to five main contractors, depending on the scale and complexity of the project. Recently, a few Australian contractors have entered or tried to enter the market in joint ventures with New Zealand main contractors. This trend is likely to continue.<sup>21</sup> It is considered unlikely, however, that Australian companies will bid in their own right in the future, even with the advent of the government 5-year construction guarantee, as they generally have as much work as they can handle in Australia in the foreseeable future. In addition, any Australian company would need to substantially rely on the New Zealand supply chain, which is already near maximum capacity in regions where major projects are planned. This does not of course preclude future Australian involvement in the ownership and management of New Zealand companies.

The Advisory Group has no evidence that a reduced number of bidders on major capital projects has resulted in unreasonable margins. Evidence suggests that increased main contractor margins may have added approximately 2 percent to construction costs in the Auckland market over the past 5 years. Margins are not expected to increase further over the next 5 years and the current levels are considered acceptable for a sustainable industry.

Anecdotal evidence indicates that subcontractor margins have risen by significantly greater percentages than main contractor margins, indicating the power of sellers in this part of the supply chain. This position is unlikely to change unless the certainty of work volumes in roading and predicted volumes in other construction sectors attracts new entrants. Main contractors may consider hiring more directly employed staff to counter subcontractor rates increases. This assumes additional staff and workforce can be economically sourced and managed.

### 6.5.4 SUPPLY CHAIN

While two main contractors have a dominant share of maintenance and construction contracts, there is, in general, adequate competition in their supporting supply chain.

Fourteen full-service (maintenance and capital work) contractors, of a total of 143 pre-qualified Transit NZ contractors, dominate 57 percent of the total value of maintenance and construction contracts awarded between 2003 and 2005. Fulton Hogan and Works Infrastructure are the two dominant players, with 23 percent and 20 percent respectively of the total value of tenders let over the same period.

<sup>20</sup> Existing or emerging main contractors include Fletcher Construction, Fulton Hogan, Works Infrastructure/Leighton JV, McConnell Dowell, Multiplex, HEB Smithbridge, Higgins, and others.

<sup>21</sup> The agreement, between Works Infrastructure and Leighton Contracting, to enter into a joint venture for the construction of capital works projects greater than \$50 million value is an example of Australian contractors exploring entry to the New Zealand market.

Vertical integration by contractors is largely limited to areas of core capability such as pavements, drainage/piling, and structures. In terms of material supply, most large contractors will source materials externally, except in the case of asphalt and pre-cast concrete. The exception is the Fletcher group of companies, which are directly involved—albeit on a stand-alone basis—in the supply of all major materials in the supply chain (except asphalt production).<sup>22</sup>

Elements of the supply chain, their weighting (percent)<sup>23</sup> in the total supply-chain input costs, and competition issues are discussed in Appendices 12.1 to 12.3. Table 4 summarises the key supply-chain issues.

**Table 4. Summary of key competition issues in the supply chain**

Supply-chain element	Competition issues
Reinforcing steel	<ul style="list-style-type: none"> <li>• Adequate competition</li> </ul>
Concrete and concrete pipes	<ul style="list-style-type: none"> <li>• Cement duopoly with limited import substitution</li> <li>• Ready mix—adequate competition</li> <li>• Pre-cast—adequate competition</li> <li>• Pipes—two main firms. More competition would be beneficial</li> </ul>
Asphalt and fuel	<ul style="list-style-type: none"> <li>• Top two main contractors have strong relationships with top two distributors. Import substitution is realistic</li> </ul>
Quarry products	<ul style="list-style-type: none"> <li>• Adequate competition in the Auckland market</li> </ul>
Contractors' margins	<ul style="list-style-type: none"> <li>• Main contractor numbers have reduced, but adequate competition remains</li> </ul>

## 6.6 IMPACT OF INDUSTRY CAPACITY ON INPUT COSTS

Continuing high volumes of work, especially in infrastructure, will result in a shortage of industry capacity, so no significant reduction in prices is expected in the medium term.

The Advisory Group commissioned Saha International<sup>24</sup> to carry out an overview of likely demand for construction resources in the Auckland area over the next few years. The purpose of this research was to gauge the broader market demand for the same construction resources needed by Transit NZ for state highway construction and maintenance in the Auckland region.

Territorial local authorities in Auckland are forecasting an increase of about 15 percent in infrastructure expenditure over the next 3 years.

The residential construction sector is expected to remain static following a 20 percent contraction in the value of building consents in the year to March 2006. In the event that residential market activity drops, pressure would come off those supply items (for example, aggregates, concrete pipes) that are a significant component of sub-divisional work.

Non-residential building has softened from a peak in 2005, but investment is expected to remain strong, providing competition for resources with the roading sector in a number of key input areas.

<sup>22</sup> Saha International Ltd, Workstream Three Report, 3 August 2006, p1.

<sup>23</sup> Bond Construction Management Ltd, 19 June 2006.

<sup>24</sup> Saha International Ltd, 'Demand for Construction Resources in the Auckland Region', prepared for the Ministerial Advisory Group on Roading Costs and Transit NZ, 7 July 2006.

While the hospitals and Department of Corrections major capital programmes in Auckland and Waikato are nearing completion, there is significant future growth expected in other non-roading infrastructure, including, for example:

- the upgrading of electricity networks and additional generation capacity
- stadium development in preparation for the Rugby World Cup
- implementation of the Auckland rail network upgrade and
- water, waste-water, and storm-water upgrades.

Although there is some uncertainty about start times for many of these works, Transit NZ needs to be mindful that they will provide competition for many of the construction resources applicable to roading. Given the pressure on Transit NZ to deliver the major Auckland capital projects, there will be little flexibility to work around other infrastructure programmes.

Although the Saha International study focussed on Auckland, it is acknowledged that pressure on resources will affect construction also in the Waikato and Bay of Plenty because of the relatively high expected construction volumes in those regions and a degree of common contractor/supplier sourcing with the Auckland market.

### **Professional services**

While high demand for professional services, for example in the design area, has resulted in increased project costs, the increase is moderate in project terms and the Advisory Group found that there is sufficient competition and capacity within this part of the industry to suit current and expected needs.

## **6.7 IMPACT OF DISCOUNT RATE CHOICE ON CAPITAL INVESTMENT AND MAINTENANCE DECISIONS**

The choice of a 10 percent discount rate for investments in construction and maintenance works needs to be revised as the discount rate chosen influences the value for money outcomes over the lifetime of a project.

The choice of discount rate has an impact on the scope, design, and choice of both wider land transport programmes and detailed project design. Recent increases in land transport investment and the multimodal focus of the NZTS are resulting in choices between types of infrastructure with potentially different cost, benefit, and risk profiles. Projects with longer term benefits may be unfairly disadvantaged if the current discount rate is too high. Projects with relatively high-risk profiles may be unwisely advantaged under the current discount rate.

The Treasury is considering the effects of a 10 percent real discount rate for all of government.

A lower discount rate might have the following impacts on road construction and maintenance:

- Projects with benefits weighted towards the long term may have a higher priority than at present
- Project designs may tend towards higher quality construction at an increased capital cost with an expectation of lower and/or less-frequent future maintenance expenditure, and
- Intervention with capital renewals may take place sooner—for example, the timing of area-wide pavement treatment—to avoid ongoing maintenance expenditure.<sup>25</sup>

<sup>25</sup> Rowan Kyle & Trent Downing, The effect of a reduced discount factor on pavement treatment justification, paper to June 2006, Ingenium Auckland Conference.

The effect of a high discount rate is minor, providing it is only used to prioritise capital works projects where the timing (profile) of costs and benefits are similar. Most new roads will have similar profiles: heavy land purchase and construction costs in the early years, followed by growing benefits. The result is that the discount rate will usually have little effect on the ranking of capital works for roads.

The discount rate is used in roading and other project evaluation to bring future costs and benefits back to current dollar values. Current transport investment decisions take a 'whole-of-life' view of a project using the Land Transport Project Evaluation Manual. Road construction options therefore consider not only the initial cost, but also ongoing maintenance costs, including the cost of traffic disruption. The choice of discount rate can have a large impact on these 'whole-of-life' decisions where a trade-off of upfront cost versus ongoing maintenance is made.

The current discount rate used for government investment decisions is 10 percent real (before inflation). This discount rate is high by some international standards (for example, the United Kingdom Treasury has dropped its usual recommended discount rate from 6 percent real to 3.5 percent real in recent years, and parts of Australia currently use a discount rate of 6 percent). It is also high by New Zealand commercial standards and considerably higher than the discount rate applied to New Zealand government departments in the form of the capital charge (currently 8.5 percent nominal).

## Recommendations

The Advisory Group recommends:

- The Advisory Group supports the work being undertaken by Transit NZ, Land Transport NZ and local government on the means of encouraging an appropriate level of competition in key areas
- The Advisory Group recommends that Transit NZ supports the development of emerging New Zealand companies with main contractor potential and, where possible, removes barriers to entry for these firms
- These firms should be assessed on their developing capability through a certification system, and the performance and behaviour of the firms regularly audited. As far as possible, lack of a track record on major Transit NZ projects should be removed as a possible barrier to entry, and
- The Advisory Group supports further work on discount rates, given the current environment of increased road development.

## 7.0 PROCUREMENT

### 7.1 CONSTRUCTION CONTRACTS

In recent years, Transit NZ has developed a comprehensive range of contract procurement options and is generally applying these options flexibly according to the particular project.

For more complex and risky projects, there has been a positive move towards the earlier involvement of contractors in the project. This leads to better design solutions and better clarity of final contract scope for the contractors.

Larger project packages have the potential to reduce overall transaction costs through a single planning and approval process, a reduction in the number of contracts, greater buying power, and attraction of offshore participation.

#### 7.1.1 DESIGN/CONSTRUCT CONTRACTS

Transit NZ has achieved efficient design outcomes and a high degree of risk transfer from the design/construct contract model in which the contractor takes full responsibility for both the design and construction of the project. While ensuring Transit NZ design standards are complied with, the contractor focuses on achieving the most efficient and practical designs within the tight constraints of its competitively priced project budget.

The Advisory Group strongly supports the continuation of the design/construct contract delivery option. However, it should be noted that main contractors on some large-scale and complex urban or semi-urban projects have had unsatisfactory margin outcomes when working under this model. Unsatisfactory margins may have resulted from a number of factors, including:

- pricing low to win high-profile projects
- inexperience with complex urban projects
- inadequate design contingency at time of tender, and
- other factors, such as input cost increases that are unrecoverable under the provisions of the contract.

The Advisory Group considers it important that Transit NZ continues to keep an open dialogue with the main contractor group to ensure that risk transfer is properly apportioned between the parties. It is important for these contractors to view Transit NZ work as an attractive proposition when balanced against other construction sector opportunities.

A good example of risk being apportioned effectively is the approach adopted by Transit NZ for the Wellington Inner City Bypass project where the risks have been allocated to the parties best able to control them.

There is a Transit NZ requirement to have a design/construct type of delivery model for all projects greater than \$50 million. While the Advisory Group agrees with this approach in general, there are some exceptions where a traditional measure-and-value contract based on a client design is appropriate. This is for projects where there is only one possible design configuration due to constraints such as consent conditions and practical limitations. An example of this is the Newmarket viaduct where there will only be one workable design configuration.

### 7.1.2 ALLIANCE CONTRACTING

Transit NZ's first involvement with a collaborative contracting model was demonstrated with the Grafton Gully 'Freeflow' Alliance in downtown Auckland in 2002/03. Overseas experience has shown for projects that have uncertainty to do with scale, complexity, and out-turn cost, the Alliance contract structure provides the greatest alignment of interests for the contracting parties and the best project outcomes in the widest sense for all stakeholders. The model removes the potential for contractual conflict and enables the participants to focus attention on achieving the best time, cost, and quality outcomes for the project. The owner has full transparency on all commercial outcomes. The back analysis of the Grafton Gully project<sup>26</sup> showed outstanding results for time, cost and quality delivery, safety performance, and stakeholder satisfaction. Transit NZ has now entered its second alliance, for the ALPURT B2 project.

Some parties have concerns, however, about project alliancing. There is doubt about the extent of competition in negotiating the target out-turn cost (TOC). The TOC is the figure that is negotiated with the alliance and that forms the base for shared risk-and-reward payment structures for the alliance participants. Although an industry expert is employed to independently assess and assist negotiation of the alliance-provided TOC, some feel that the TOC finally agreed represents a 'soft' result. This has led recently in Australia to a competitive process for establishing the TOC being adopted on some projects to give the client better comfort that they have a sufficiently competitive outcome.

It is also possible that there is more room for scope embellishment than would be the case, for example, with a design/construct contract. 'World class' standards might be easier to justify within the alliance model than in the case where a contractor's budget has been tightly constrained by a fixed scope at the time of tendering.

Alliancing is seen as an effective delivery model for the right project, but it is important that scope is tightly controlled within the project budget and that the TOC negotiated represents a significant stretch for the commercial participants to achieve the further profit incentives available under the alliance structure.

Transit NZ considers one major benefit of alliancing is that projects are able to start earlier. While acknowledging this potential advantage, there is also a risk that once the participants are embedded in the process, the ability for the owner to exit the commercial or TOC negotiations becomes limited.

### 7.1.3 MAINTENANCE CONTRACTS

Traditionally, Transit NZ has used a measure-and-value contract type for its maintenance work and still uses this approach for just under half of its contracts. These contracts are let on a 3-year basis with extensions possible out to 5 years (3 years + 1 year + 1 year). The consultants and contractor have separate contracts with Transit NZ, and performance-based criteria are used to monitor outcomes. Measure-and-value contracts are the predominant form used by local government.

In recent times, Transit NZ has developed two longer term procurement models. These are the 5-year (Hybrid) and 10-year performance-specified maintenance contracts, which are contracted on a lump-sum basis. The use of these contracts has generally helped maintain unit cost increases at modest levels despite pressure of rising input costs in the roading sector. These longer term contracts, which in general have been strongly contested, give certainty to contractors and consultants and help to drive innovation and continuous improvement in asset management.

<sup>26</sup> GGP Alliance Value for Money Result Report, June 2005.

One issue, however, for Transit NZ in entering into such long-term maintenance contracts, is certainty of funding. The shorter term traditional procurement method described above gives more flexibility to deal with changes in funding.

Local government has one 10-year contract in the Bay of Plenty in which Transit NZ also has a minor involvement (10 percent is State highway). The 'Bay Roads' example has a consultant acting as head contractor, with two main suppliers carrying out the physical works. Western Bay District Council is very satisfied with the procurement method to date.

Transit NZ was intending to split its work roughly in thirds among the three procurement types; however, management sensibly believes that achieving this ratio is less important than making sure that each procurement choice suits the particular project context. Overall, the Advisory Group considers that the current procurement mix appears sensible for Transit NZ works but is aware that Transit NZ and Land Transport NZ are reviewing their approach as part of the Value for Money project and procurement reviews, respectively. For example, Transit NZ is considering, for unique sections of highway, the possibility of long-term 'evergreen' maintenance alliances with designer/contractor participants.

#### Recommendation

Although the Advisory Group does not have details of particular projects, it supports in principle the investigation of long-term relationship contracts for maintenance alliances, subject to acceptance by the industry and suitable performance setting and monitoring (using key performance indicators (KPIs)) to ensure value for money over time.

#### 7.1.4 PROCUREMENT OF DESIGN CONSULTANTS

Comment from various contractors was that tight pricing of professional services through competitive procurement procedures can result in less time for design innovation, less time for experienced design review, and a tendency toward conservative design. While the procurement method should mean that price is only a modest factor in the selection process, comment from designers suggests that the non-price attributes are commonly being scored in a narrow band, with the consequence that price becomes the differentiating factor. Given that design costs are modest relative to overall project costs, but that good design and planning can enhance timely project delivery and value for money, the Advisory Group suggests that the procurement methods for consultants are reviewed to ensure that optimal outcomes are achieved.

Transit NZ advises that commercial arrangements are designed to fit the commission such that where there is risk, complexity, and scope for innovation, the arrangement is flexible enough for the best design to be used.

While the information received by the Advisory Group about procurement methods is mainly anecdotal, it is recommended that a specific group is established with designer, contractor, Transit NZ, and Land Transport NZ representation to look into whether current procurement procedures are appropriate to encourage the best design innovation and the most efficient designs. It is understood that this issue is under review from Transit NZ's "Supplier summit" process.

#### 7.1.5 PROCUREMENT DOCUMENTATION FOR CONTRACTORS AND CONSULTANTS

Consultants and contractors told the Advisory Group that although Transit NZ and local government have taken steps to reduce the amount of documentation required for pre-qualification and tendering, more could still be done to minimise duplication of effort by the industry. The Advisory Group understands that Transit NZ has a pre-qualification system for contractors and is currently examining the introduction of this system for professional services.

The Advisory Group supports the approach where suppliers get certified according to a system that rates each company in terms of key capabilities and experience, and enables them to be accepted for a certain project type and size over a period of time (say up to 3 years) without further pre-qualification. Suppliers retain their certification (subject to audit) if satisfactory outcomes and behaviours are maintained in key areas, including time, cost and quality of delivery, and environmental and safety performance. Some projects will still require specific expertise, experience, and approaches. The procurement process will need to consider the quality and cost attributes of these aspects. If procedures are rationalised in this way, owners and suppliers will be freed of much of the repetitive presentation of procurement documentation.

#### 7.1.6 LOOKING TO THE FUTURE

Land Transport NZ is currently reconsidering its approach to procurement to see what modifications to the competitive pricing procedure (CPP) approach could be justified and what additional procurement methods could be used in the transport sector. Transit NZ also advises that it is investigating the application of framework and term contracts for its capital works programme.

The NZ Construction Industry Council assisted by others (Building Research, Roading New Zealand, Site Safe New Zealand) has recently established principles of best practice in construction procurement, based on the United Kingdom 'Rethinking Construction' initiatives started in 1998 by Sir John Egan. In the United Kingdom there has been a strong focus on relationship contracting in which public sector clients in particular have moved from a 'lowest cost' to a 'value for money' procurement environment. Performance is measured by a range of key performance indicators addressing time; cost and quality; and environmental, safety, and community objectives. Certainty of time and cost estimation is also monitored and case studies cited indicate marked improvement over time.

A meeting with New Zealand government ministers is planned in early September this year to be attended by Don Ward, the Chief Operating Officer of Constructing Excellence in the Built Environment, the government-supported industry improvement body in the United Kingdom. Transit NZ and Land Transport NZ will have the opportunity to compare the UK approach and experience with their own plans for procurement in the future.

#### 7.1.7 PUBLIC-PRIVATE PARTNERSHIPS

The full potential for public-private partnerships (PPPs) in the transport sector is yet to be realised in New Zealand. The ALPURT B2 project is the first roading project being delivered under the LTMA tolling provisions. The project is being financed by a combination of public funding and tolling.

Australia continues to exploit PPP opportunities. Queensland, for example, has recently instigated a major initiative with the infrastructure industry setting out very clear guidelines to the private and public sector as to what the process will be and the accountabilities involved.

### Recommendations

The Advisory Group recommends that:

- The method of procurement of design consultants is reviewed.
- The PPP procurement method continues to be investigated for its appropriateness in the New Zealand industry. Because of risk transfer and increased cost-efficiency, private sector involvement has significant potential to contain costs in the construction and maintenance of larger roading projects. Projects would also be more likely to be completed on time.

## 8.0 SUMMARY OF LOCAL GOVERNMENT IMPLICATIONS

Local government's combined maintenance expenditure and capital investment forecast over 10 years from 2006/07 is approximately \$13.7 billion, including an assumed 50 percent local share and NLTP funding. This is of a similar scale to that for State highways, with a combined spend of \$13.3 billion. 50 percent of this total local government road expenditure is met from NLTP sources, assuming a 50 percent FAR. However, maintenance cost issues have a proportionally greater financial impact on local government, with forecast 10-year local road maintenance expenditure being significantly higher than state highway maintenance expenditure. On the other hand, road construction expenditure by Transit NZ is far greater than that for local government.<sup>27</sup> The following are issues affecting local government.

### 8.1 CONSTRUCTION COSTS

The average project cost of local government construction works in the period 2001–2006 was approximately half that of the average Transit NZ project cost (see Appendix 7.0). Construction cost increases in section 6.2 of this report, although focused on Transit NZ projects, are likely to have had a very similar impact on local road construction, as the same pool of contractors and resources are used.

### 8.2 MAINTENANCE COSTS

Input cost increases for maintenance work have been separately identified for local roads in section 6.4 of this report. This assessment shows that Transit NZ and local authorities have experienced similar changes in unit rates for benchmark maintenance work categories (reseals and area-wide pavement treatments). Rural local roads, however, appear to have experienced somewhat lower rates increases than urban local roads and State highways. Rural road maintenance rates increases, which have been at about inflation levels in recent years, are somewhat surprising and could indicate that these rates, given fuel and bitumen price increases, may not be sustainable.<sup>28</sup>

Future maintenance cost increases have been identified as a possible risk for councils that are not conducting pavement deterioration modelling. This could have significant local impact, particularly for smaller rural councils where roading can comprise well over 50 percent of the annual plan budget. In some areas the financial pressure on ratepayers is of major local concern, such as in Southland, where there is a huge increase in required maintenance because of the need to replace bridges built during the Depression. In rural councils such as those in Northland, cost increases are leading to a reduction in new sealing and an inclination to leave roads unsealed to reduce ongoing maintenance costs. In an environment in which there is always pressure to control the amount of income that can be raised through rates, ongoing increases in costs mean that there will be at best limited improvement and at worst a deterioration in rural roads.

### 8.3 COMPETITION ISSUES AFFECTING INPUT COSTS

Both Transit NZ and local government have faced similar declines in recent years in the number of tenderers per contract (see further analysis of the average number of tenderers for construction and maintenance contracts in Appendix 12.5). Analysis of Transit NZ's tender numbers indicates that there are less than ideal numbers of bidders for contracts in the South Island and the East Coast of the North Island. The solutions which Transit NZ is pursuing for the low levels of contestability also apply to local government. Local government procurement would be assisted if smaller councils cooperated through shared service arrangements to provide the management skills and operating scale necessary to implement these initiatives.

<sup>27</sup> Based on the 2006/07 National Land Transport Programme, local road forecast 10-year maintenance expenditure (\$9,788 million), including an assumed 50 percent local share, is approximately double the size of state highway maintenance expenditure (\$4,942 million). Forecast ten-year local road construction investment (\$3,948 million), including an assumed 50 percent local share, is approximately half the size of state highway investment (\$8,399 million).

<sup>28</sup> See Opus International, *ibid*, p18 and p23.

#### 8.4 SCOPE CHANGE

Most of the scope change drivers identified in the report also impact on local roading. Local government also faces the challenge of defining project objectives in early planning, although constraints on meeting local share requirements may place a stronger funding cap on local road projects.

#### 8.5 DESIGN STANDARDS ISSUES

The Advisory Group was told by local authorities that there is a tendency towards overly conservative designs. Conservative designers, combined with a lack of engineering purchasing skills are thought to be leading in many cases to a less than ideal balance of operating risk against construction costs. It was also reported that Transit NZ-sourced standards often become a de facto national standard that can be inappropriate at the local level. Consultants are reported to sometimes use such standards in the absence of alternatives, as low-risk but often high-cost solutions. Temporary traffic management standards are one example where a national standard is now being revised to allow flexibility in local circumstances.

#### 8.6 ORGANISATIONAL ARRANGEMENTS AND PROCESS ISSUES

The principal issues of concern raised in local government discussions relate to the nature of strategic and project-specific planning as well as organisational and process issues.

The Regional Land Transport Committee structure received wide-ranging criticism. The large scale and representative nature of Regional Land Transport Committees suggest that they are ill equipped to make complex transport system decisions and funding trade-offs. Not all committee members are financially accountable for their decisions, meaning financial realism can be lacking.

The time taken for decision making regarding a road construction project was generally considered excessive. This includes initial research and planning, designations, consents, consultation, and funding approval. In Auckland, this is further complicated by the need for agencies to confer on network projects across the region, and with an additional agency, the Auckland Regional Transport Authority, coordinating funding detailed plans and priorities for the region. While Auckland Regional Transport Authority coordination of road funding applications is considered successful, the Auckland CEO Forum considers that there is a need for further strategic alignment between the agencies.

The Land Transport NZ approval processes were considered by many to be too onerous. Some councils were reported to be walking away from Land Transport NZ subsidies because of potential delays, and bearing the costs themselves. It was also reported that 1-year project planning and completion is no longer possible.

It was suggested that Land Transport NZ's processes could be focused on strategic alignment rather than project-specific approvals. There was also suggestion that the CPPs can be too restrictive. There is certainly opportunity to streamline the funding approval process for smaller projects; this recommendation has already been made by the Advisory Group.

## 8.7 PLANNING ISSUES

Local authorities would like a more strategic approach, including a national planning framework aligning the range of strategic processes and documents. Implementation planning for NZTS has been slow and does not provide the necessary connection between local, regional, and national plans, including definition of national priorities and strategy. It was considered that more leadership is required from the Ministry to implement these connections and achieve NZTS ownership at a local level. As discussed earlier in the report, strategy and planning documents need to be aligned in terms of planning cycles and operations. 10 year council plans are incompatible with 1-year funding by Land Transport NZ and can contribute to stop/start project planning and therefore higher costs.

Operationally, there are strong reasons to align the plans of the different local authorities and transport entities, as transport systems are a closely interrelated network where development in one part can have far-reaching operational and financial impacts. For example, Auckland City Council states that the SH20 Mt Roskill extension will cost them about \$25 million for distributor streets, until completion of Waterview, with additional costs for Waitakere City.

Local government also has the capacity to influence land use change to minimise demand on roads. The 'Smart Growth' integrated transport and land use planning relationship between Transit NZ and Tauranga City/Western Bay of Plenty District Council is a positive example.

## 8.8 FUNDING ISSUES

While funding systems are largely outside the Terms of Reference of this report, funding uncertainties contribute to difficulties in coordinating local plans, create stop/start planning, and therefore contribute to increased costs. More formal longer term funding is needed. There was considered to be a lack of clarity about the detailed requirements for national (N), regional (R), and Crown funding(C), including the role of Regional Land Transport Committees in regional fund allocation. The requirement for local share on R funds has contributed to this uncertainty.

### Recommendation

This area remains a strongly contested issue within the industry, and the Advisory Group recommends that Transit NZ and Land Transport NZ consider fully the merits of competitive TOC pricing in its planning for future alliance projects.

## 9.0 ACKNOWLEDGEMENTS

The Advisory Group would like to thank the Ministry of Transport, Land Transport NZ, Transit NZ, industry organisations, local government, and others for their excellent cooperation in compiling this report. It is clear that much can be achieved in the roading sector with increased collaboration and alignment of interests within a coordinated strategic framework.



the 1990s, the number of people in the world who are illiterate has increased from 1.2 billion to 1.5 billion (UNESCO 2003).

There are a number of reasons for this increase. One of the main reasons is that the population of the world is growing rapidly. In 1990, the world population was 5.3 billion. In 2003, it was 6.1 billion. This means that there are 800 million more people in the world than there were in 1990. This increase in population has led to an increase in the number of people who are illiterate.

Another reason for the increase in illiteracy is that the quality of education is poor in many developing countries. In these countries, the schools are often overcrowded and the teachers are not well trained. This means that the children do not learn as much as they should. As a result, many children who go to school do not learn to read and write.

A third reason for the increase in illiteracy is that many people in developing countries do not have access to education. In these countries, the schools are often far away from the villages and the roads are poor. This means that many children cannot go to school. As a result, many children who are of school age do not go to school and become illiterate.

There are a number of ways to reduce the number of illiterate people in the world. One way is to improve the quality of education in developing countries. This can be done by training teachers better and by providing better facilities in the schools. Another way is to provide more access to education in developing countries. This can be done by building more schools and by improving the roads.

It is important to reduce the number of illiterate people in the world because illiteracy is a major barrier to development. Illiterate people cannot read and write, so they cannot get a good job. This means that they are poor and they live in difficult conditions. If we can reduce the number of illiterate people, we can help to reduce poverty and improve the quality of life in developing countries.

There are a number of organizations that are working to reduce the number of illiterate people in the world. One of the most well-known is UNESCO. UNESCO has a program called the Global Education Initiative (GEI) which is working to improve the quality of education in developing countries. There are also many other organizations that are working to provide access to education in developing countries.

It is important that we all work together to reduce the number of illiterate people in the world. We can do this by supporting the organizations that are working to improve education in developing countries. We can also do this by making sure that we all have access to education. If we can do this, we can help to reduce poverty and improve the quality of life in developing countries.

There are a number of things that we can do to help reduce the number of illiterate people in the world. One thing is to make sure that we all have access to education. This means that we should make sure that there are schools in every village and that the roads are good. We should also make sure that the teachers are well trained and that the schools have good facilities.

Another thing that we can do is to make sure that we all have access to books. This means that we should make sure that there are libraries in every village and that the books are good. We should also make sure that the books are in the local language. If we can do this, we can help to reduce the number of illiterate people in the world.

It is important that we all work together to reduce the number of illiterate people in the world. We can do this by supporting the organizations that are working to improve education in developing countries. We can also do this by making sure that we all have access to education. If we can do this, we can help to reduce poverty and improve the quality of life in developing countries.

