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TOWARDS THE FIRST NATIONAL INFRASTRUCTURE PLAN

SUBMISSION TO THE NATIONAL INFRASTRUCTURE UNIT, THE TREASURY

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BACKGROUND TO IPENZ

The Institution of Professional Engineers New Zealand (IPENZ) is the lead national professional body representing the engineering profession in New Zealand. It has approximately 11,500 Members, including a cross-section from engineering students, to practising engineers, to senior Members in positions of responsibility in business. IPENZ is non-aligned and seeks to contribute to the community in matters of national interest giving a learned view on important issues, independent of any commercial interest.

This submission was prepared in consultation with the IPENZ Membership, and it prompted significant interest. Specific advice was sought on the various infrastructure sectors from Members with relevant industry knowledge. In addition IPENZ arranged national seminars on the Discussion Document in Auckland, Wellington, and Christchurch and good feedback was received from Members. IPENZ greatly appreciates the contribution to those seminars from the staff of the Infrastructure Unit and this has considerably enhanced the quality of the advice we have been able to provide in this Submission

EXECUTIVE SUMMARY

IPENZ supports the approach of the Infrastructure Unit in releasing and seeking comment on this “precursor to the plan”.

Our key comments to the plan are summarised as follows:

STRATEGIC PLANNING AND ASSET MANAGEMENT PLANNING

Infrastructure plans need to be prepared in the context of strategic planning, setting out the outcomes that the government wants to achieve for society, and the desired levels of service. This is insufficiently recognised in the document.

In our view, the efficient use of capital, taking into account that capital must be distributed between dissimilar forms of infrastructure, can only be achieved by a systematic application of asset management principles, based on a strategic plan and customer-derived levels of service. Another significant weakness is the lack of reference to demand management as a potentially better form of capital investment.

It is noted that Treasury has been using the term “capital asset management” and its continued use runs the risk of asset management being considered as a means of evaluating capital purchases rather than for managing assets more holistically.

THE PURPOSE OF A PLAN

IPENZ believes that the major role for the Infrastructure Unit will be to provide over-riding strategic direction addressing issues such as promoting strategic planning, and guidance on asset management, infrastructure governance, funding, pricing and procurement, and in promoting 10-year sector plans as discussed below. The Infrastructure Unit can take advantage of a number of existing best-practice guidelines on asset management planning, derivation of service levels, cost estimating, optimised decision making, outsourcing and public-private partnerships.

Developing one infrastructure plan with one set of prioritisation criteria is problematic for such a variety of infrastructure, since in each sector different outcomes are being sought. Under the umbrella of the strategic direction of the Infrastructure Unit there is still a need for 10-year sectoral infrastructure plans consisting of a list of funding requirements and projects intended to achieve the desired service levels. The principle purpose of this will be to provide funding certainty for the relevant supply industries and project certainty for planning agencies, and for those affected by projects. This is feasible for transport (road, rail), water, wastewater, corrections, health and education. It is noted that unfortunately the NZ Transport Agency has recently withdrawn its publically available 10-year State Highway Plans.

PRINCIPLES

IPENZ believes there a number of missing principles – strategic asset management, adapting to climate change and demand-side management should be overriding principles for the infrastructure plan. Important issues that also need to be considered in a plan are co-ordination, infrastructure interdependency and resilience, and forward planning for the workforce needed to deliver infrastructure.

As outlined, the principles are generally appropriate, although there is concern over the relatively limited discussion on cost-benefit analysis and the apparent under-focus on local government performance.

SECTORAL AND CROSS-SECTORAL ISSUES

The sectoral analysis identifies missing infrastructure including electricity distribution, gas distribution, water treatment, stormwater, flood control, coastal protection and solid waste management. A significant omission is the lack of discussion on the projected doubling of freight by 2040 affecting the infrastructure of road, rail, ports, coastal shipping and airports.

Finally, our submission discusses cross-sectoral issues – the ongoing need to improve the designation provisions of the Resource Management Act, the multiplicity of legislation affecting infrastructure improvements, local government performance and finance, and demographic trends and planning.

DETAILED SUBMISSION

1. THE CONTEXT FOR INFRASTRUCTURE PLANS

An infrastructure plan needs to first set out the context within which the plan is developed. This is to achieve the effective use of capital to enable the ease of flow of materials, products, people and services within the New Zealand economy, ensuring that infrastructure enables, rather than hinders, economic efficiency and growth.

1.1 STRATEGIC PLANNING

Taking this into account, an infrastructure plan needs to emphasise that infrastructure is a means to an end, not an end in itself. Therefore those “ends” need to be defined for each sector of infrastructure – and the typical mechanism for this is a strategy or strategic plan – setting out the outcomes sought by the government (failing to plan is planning to fail). Outcomes are then quantified by setting the required levels of service. Past central government examples include the *Energy Strategy*, the *Digital Strategy*, the *Transport Strategy* and the current *Road Safety Strategy 2020*. A strategic plan should be outcome focussed and not go into the “how”.

Other examples are the regional strategies (Wellington, Christchurch) or growth strategies (Auckland, Bay of Plenty) developed by a number of regional councils. Only when regions have thought through how their region will and should develop over the next 30 or more years, can sensible decisions be made on the transport infrastructure needed to serve those regions.

These plans provide the context for infrastructure and the outcomes it should deliver. Only when these outcomes have been decided can infrastructure projects be identified.

Deciding outcomes also recognises that the provision of infrastructure to meet demand is only one means of achieving strategic outcomes. Non-infrastructure interventions as alternatives to simply increasing infrastructure supply include:

- pricing mechanisms – for example, suppressing demand for infrastructure for electricity, water or transport infrastructure where there is a clear efficiency gain by doing so, or where a resource is limited
- financial incentives – for example, subsidising alternative technologies for solar hot water heating reduces demand for electricity
- information and education – for example, reducing demand for water or electricity, or reducing car crashes
- regulation – for example, regulating the aviation industry improves safety; regulating water quality improves health outcomes
- government agencies acting directly – for example, the Govt³ initiative involved government departments reducing electricity consumption and solid waste.

Such interventions should be applied where it can be demonstrated that the return on capital is higher than increasing infrastructure supply.

1.2 LEVELS OF SERVICE

Having decided on the outcomes sought by government (generally qualitative in nature), the next step is to arrive at the related quantifiable levels of service required by customers for a particular sector of infrastructure (the customer comes first). Levels of

service need to be arrived at in consultation with the users of those services. There are a number of techniques used to derive levels of service – focus groups, surveys, questionnaires, community meetings. There is still very little use of user-derived levels of service in central government – many agencies still work on the basis of “we know best”.

The National Asset Management Steering Group has prepared a guideline on how to derive levels of service that best reflect customer needs, entitled *Developing Levels of Service and Performance Management Guidelines*.

1.3 ASSET MANAGEMENT PLANNING

Asset management planning is reasonably well developed in local government and in the electricity distribution industry, and is undergoing ongoing improvement. IPENZ believes that it is underrated in central government and is often regarded as maintenance management and as a complex and technical operational tool. Strategic asset management provides the context for infrastructure decisions and is fundamental to achieving organisational strategic outcomes.

In summary an asset management plan:

- explains the relevant strategic outcomes that the assets contribute to
- sets out and shows agreement on the levels of service for “customers”
- establishes asset inventories, undertakes condition assessments, and assesses remaining useful lives
- forecasts future demand
- identifies future maintenance, renewal and capital expenditure requirements to meet levels of service requirements and to meet future demand
- assesses future financial requirements.

Associated with these steps is the need to identify risks and critical assets, establish priorities for maintenance, renewal and capital expenditure activities, and undertake analysis of options (optimised decision making).

What is the difference between an infrastructure plan and an asset management plan? It should be noted that this document *Towards the First National Infrastructure Plan* correctly focuses only on capital projects – which are clearly only one aspect of infrastructure activity. An infrastructure plan for one form of infrastructure is thus a subset of a strategic asset management plan for that particular infrastructure.

Therefore, a strategic asset management plan should be used to drive asset investment decision making and ensure maximum returns for government expenditure – better value for money.

1.4 IMPLEMENTATION

Only when these steps have been taken do the issues raised in the document *Towards the First National Infrastructure Plan* come into play. The issues discussed in the document – funding mechanisms (revenue, debt, public-private partnerships), procurement mechanisms, project evaluation, prioritisation, and optimised decision making – are all essentially implementation and operational in nature.

1.5 THE PURPOSE OF AN INFRASTRUCTURE PLAN

It is unclear what the final infrastructure plan will be. The introduction suggests it is intended to be a high-level view of the state of infrastructure (this is not planning) and to

describe the principles and direction for future investment. These do not constitute an infrastructure plan as it is commonly known.

It is recognised that it is very difficult (if not impossible) to develop one plan and one set of prioritisation criteria for such a variety of infrastructure, since each is seeking to achieve different outcomes. Service levels need to be developed individually for each sector at the highest level and it is recognised there needs to be some mechanism to allocate funding between these diverse demands – arguably this is the role of Cabinet.

The call for an infrastructure plan arose from the infrastructure industry and referred to the *South East Queensland Infrastructure Plan and Programme*. In this programme the Queensland Government made a 10-year commitment to fund a well-defined programme of infrastructure and set out an indicative prioritised list for the second 10 years.

The contracting industry had indicated that funding certainty was needed to enable it to have the confidence to invest in recruiting and training new staff, up-skilling staff, purchasing new plant and replacement machinery, and developing new sources of raw materials, such as quarries.

The National Party's 2008 Infrastructure Policy stated that a 20-year national infrastructure plan would be created spelling out investment objectives. The policy would:

- set a clear direction for vital national infrastructure, including top priority projects
- take into account New Zealand's needs in a rapidly changing world, including the need for infrastructure projects that contribute to a cleaner environment and a stronger economy
- address the planning, regulation, governance and finance of infrastructure, including an agreed set of projects that will receive central government support and a timetable for investment and delivery.

In addition to the needs of the construction industry, project certainty (as opposed to funding certainty) is also important for regional planning, land-use plans, infrastructure users and affected communities. This enables regional and district plans to be developed with confidence and enable designations and planning consents to be obtained well in advance of the construction timetable.

Therefore, one purpose of a sectoral infrastructure plan should be to provide funding certainty for the relevant supply industries and project certainty for those affected by projects.

The government needs to rethink the infrastructure plan proposal to achieve these objectives. For some sectors – such as transport (road, rail), water, wastewater, corrections, health and education, 10-year infrastructure plans (lists of funding and projects) are feasible with three yearly reviews. These could be developed by each of these sectors and summarised in the Infrastructure Unit's plan. These must be set against the sectoral strategic outcomes and service levels.

For electricity generation, gas, and telecommunication, 10-year lists are not feasible as these forms of infrastructure are delivered by the market. However, for these utilities, government desired outcomes and levels of service can be specified, supported with partial government funding where it is evident that the service level cannot otherwise be reached, for example broadband and dry-year generation.

It is also appropriate that within the context of each sectoral asset management plan, the 10-year infrastructure plan for each sector should spell out top priority projects and

give some indication of the priorities for the second decade. This type of plan would meet the requirements of the National Party's infrastructure policy and achieve its objectives.

In contrast to National's policy, there have been some recent retrograde steps for infrastructure planning.

- This year, the roading sector has seen the loss of the publicly available State Highway 10-year plan. At the very time that the Infrastructure Unit is suggesting an infrastructure plan, the NZ Transport Agency has withdrawn the only 10-year infrastructure plan produced by a central government agency. This is in contrast to the statutory requirement for local authorities to produce a 10-year *Long Term Council Community Plan* that include infrastructure.
- It is also noted that the Infrastructure Bill currently before Parliament amends the New Zealand Railways Corporation Act 1981 by repealing Section 40 that requires the Railways Corporation to provide the Minister with a programme of major capital works for the following year in the context of a five-year strategic plan.
- The Rail Network Bill (2006), that has not been enacted, required the preparation of a rail network development plan that included a statement of priorities for the current financial year and the nine following financial years, and a forecast of proposed capital expenditure for these years.

In summary, IPENZ believes that 10-year infrastructure sectoral plans outlining both funding and projects, with three yearly reviews is important to the industries that deliver infrastructure, to other planning agencies, and to affected communities.

The Infrastructure Unit has a role in ensuring these rolling 10-year sectoral plans are in place so that there is information available to inform the distribution of limited public capital between sectors and it is of good quality. There is also a role for the Infrastructure Unit to provide overriding strategic direction addressing issues such as promoting strategic planning, and guidance on asset management, infrastructure governance, funding, pricing and procurement.

2. COMMENT ON POLICY CONTEXT PRINCIPLES

2.1 PRINCIPLE 1

The distinctions of public good provided by governments and private goods either provided by the private sector or regulated for natural monopolies is a reasonable approach.

2.2 PRINCIPLE 2A

The criteria for contracting out provision where services can be clearly specified is simplistic. This is a necessary condition for contracting out but not sufficient. The decision to contract out or not is more complex and includes the need to consider if there is a competitive market available. There is a comprehensive discussion on this issue in the New Zealand Standard Handbook NZS 9213:2003 - *Guide to Local Government Service Delivery Options*.

This document sets out the advantages and disadvantages of various governance and procurement arrangements and of outsourcing. Regarding the outsourcing decision it discusses availability of skills, monitoring issues, transparency, risk transfer, economies of scale, emergency response capability, contract periods, flexibility, reversibility, accountability to customers, innovation and stranded overheads.

It should be recognised that a public-private partnership (PPP) is not a whole-of-life contract as discussed in paragraph 55 – they are typically 10, 20 or 30 years – well short of the useful life of infrastructure assets.

Paragraph 55 states that government will consider all forms of contracting as long as it provides best value for money. This approach to outsourcing should consider non-financial benefits such as expertise, quality assurance, and the ability to deliver the required service levels. It should also consider alternative forms of procurement such as alliances and long-term contracts (longer than 15 years) to eliminate the requirement to reduce risk through cost increases.

Performance-based specifications to maximise innovation are appropriate for some project types, but for others with routine activities, the transaction cost can outweigh the benefits of this form of contract. The performance-based approach is often used to minimise the risk of contract variation, but as a result, often command a price premium in tendering, and single lump-sum payments used in this form of contract is a very blunt instrument that often leads to higher prices and unintended consequences in the quality of delivery. Across the country there are a variety of approaches by local authorities – some councils are increasing their costs by the way they tender contracts, others are moving to more modern contracts, such as Metrowater’s operations and maintenance contract.

Some of our Members have been critical of the poor quality of cost estimation in the industry due to lack of good scope definition and not allowing for associated “upstream or downstream” work or contingent projects upon which the core project depends for a successful outcome. These types of issues were extensively investigated by the Ministerial Advisory Group on Roading Costs in 2007, and the lessons learned are worthy of wider application.

Overall, procurement deserves more attention in the plan. The NZ Transport Agency has made substantial progress promoting best-value procurement in its *Procurement Manual*, which helps to create the new procurement environment by promoting and supporting long-term strategic thinking and obtaining value for money. It contains guidance to help obtain value for money and a step-by-step guide to developing a procurement strategy. This manual is also suitable for wider application beyond the transport sector.

2.3 PRINCIPLE 2B

The principle when to apply user charges is supported. An example of where it can be difficult to introduce user charges for a private good is in retrofitting water meters. In some cases the economic benefit (deferring developing new sources of water) does not outweigh the cost of installation, maintenance and operation. However a good case can be made for installing them for equity reasons – instead of all users paying the average through a uniform annual charge.

2.4 PRINCIPLE 3

This essentially considers the funding allocation issue in the context of local government versus central government. However, IPENZ believes this principle should be wider. Funding principles should include:

- the distribution of benefits between identifiable beneficiaries (whether on a geographical basis or types of beneficiaries)
- the distribution benefits in temporal terms – this is often referred to as intergenerational equity – and can lead to decisions to fund from revenue of loan

- the extent to which the actions or inactions of individuals or groups contribute to the need to undertake an activity (exacerbator pays)
- the costs and benefits of the funding mechanism, taking into account transparency and accountability.

Local government is a “subsidiary” of central government and central government needs to have effective mechanisms to ensure local government does not mismanage its assets and leave the country with a liability.

It was this very problem that led to the 1997 amendment to the Local Government Act 1974 that effectively mandated asset management planning, as Parliament (on the advice of the Auditor General) was concerned at a backlog of essential renewal in the local government sector. It is believed that the current mechanisms are inadequate to assess whether or not deferred investment is being built up or addressed. In the water sector particularly, the government’s inability to get meaningful statistics on renewals versus new capital spend and what percentage of capital expenditure planned is for new standards and for renewal or growth, is a case in point.

It is assumed that local government levels of service decisions and affordability are determined locally (via the Long Term Council Community Plan process). In the case of water supply (and to a large extent sewage treatment standards), dog control, building and liquor licensing, this is not true. These are now determined nationally via the *Drinking Water Standards*, the Building Act, the Resource Management Act (RMA), etc. Although it is not the purpose of this document, the appropriateness of the current model to deliver these services needs challenging. One of the most quoted reasons for mandating drinking water standards was the risk to the country’s tourist industry. This is a national problem and the government needs to have a national overview.

2.5 PRINCIPLE 4

This discusses decision making processes. Paragraph 66 states: “after identifying needs problems or opportunities”. This is essentially strategic planning as discussed above and needs to be given substantially more weight in the plan. Paragraph 66 then explains criteria in terms of social welfare and the economy’s productivity.

Paragraph 67 then suggests that “welfare” (not social welfare?) includes economic growth, environmental and health considerations. This is a rather confused discussion of criteria. Criteria should be in terms of simple economic, environmental, social and cultural outcomes. The term productivity is usually referred to as labour productivity and is a subset of economic performance.

Paragraph 67 also now uses the term “solutions” compared to Paragraph 66 which uses the term “projects”. Solutions include non-asset solutions, other policy interventions, a package of projects, or an individual project. Cost-benefit analysis (CBA) techniques can be used for all these solutions – not just projects. For projects, it is often useful to evaluate a package of interrelated projects – the individual projects might have high or low CBAs, but collectively, the benefits of the package might outweigh the costs.

Cost-benefit analysis is a useful tool to assist in prioritisation. However, it is important that CBA is not the only tool – CBA is only a tool to assist decision making, it is not an absolute measure. There are some intrinsic shortcomings of CBA, including the impact of discounting future costs and benefits, which can favour smaller projects with short construction periods that minimise the lag between investment and benefit return. In effect, this slews the portfolio of infrastructure investment towards a series of smaller, short-duration localised projects. While generating local benefits, collectively this does not provide the greater strategic benefits of larger projects. Cost-benefit analyses typically have unrealistically high discount rates imposed (currently eight per cent),

which are well in excess of real rates of return after inflation. This both promotes deferred capital expenditure and smaller value projects.

Optimised decision making (ODM) techniques need to be used, and this process incorporates CBA. Optimised decision making derives the best asset strategy or project to minimise long-term costs and maximise outcomes for the organisation and its customers. This includes consideration of social, cultural, environmental, and financial benefits in making project decisions. Optimised decision making uses evaluation techniques such as CBA and multi-criteria analysis. The National Asset Management Steering Group has helpful a manual on ODM entitled *Optimised Decision Making Guidelines*.

Therefore, to consider the evaluation of individual and discrete projects using CBA as discussed in paragraph 67 is an overly simplistic way of prioritising projects. Hence Principle 4 does not represent a sufficiently comprehensive decision-making process.

2.6 PRINCIPLE 5

It is suggested that the Crown is the largest owner of built assets in New Zealand. The sum of local authority asset values may well exceed central government's asset values. Hence the concern, discussed above, about the need for central government to have a robust overview of just how effective local government is at its role as a major infrastructure provider.

As set out earlier, the discussion of asset management is limited. Unfortunately, Treasury has been using the term "capital asset management", which is normally associated with capital expenditure. However, asset management is a broader term used for maintenance, renewal and capital expenditure – and potentially disposal of assets. If Treasury continues to use this term, asset management will continue to be considered as a means of evaluating capital purchases rather than for managing assets more holistically.

3. MISSING PRINCIPLES

IPENZ believes there are some missing principles. The intention of the principles is to guide government decision making to select projects and guide the development of regulatory frameworks. It is believed that the following principles should be included:

3.1 STRATEGIC ASSET MANAGEMENT

As discussed above, strategic asset management is the fundamental framework within which to select projects to achieve government's outcomes and levels of service.

3.2 ADAPTING TO CLIMATE CHANGE

This issue is one of the most far reaching issues for future governments, and is not given adequate emphasis in this document.

To date, government advice on infrastructure policy and performance relating to climate changes is largely sector specific with responsibilities spread across many government agencies, State Owned Enterprises, local government and utility companies. The establishment of the Infrastructure Unit provides the opportunity for addressing the need to adapt solutions to the effects of climate change on infrastructure, with a co-ordinated and comprehensive analysis of risk and how to respond to ensure hazards are adequately managed. It also needs a collaborative approach to obtain agreement on socially and economically acceptable levels of risk across society.

Therefore, a principle should be established to ensure all infrastructure is resilient to the extent of the possible changes in climate that might occur in the asset lifetime.

3.3 DEMAND SIDE MANAGEMENT

In each of the sectors, appropriate use of demand-side management is a key element for ensuring capital is optimally applied. Demand can be managed by pricing mechanisms and non-pricing mechanisms – through promoting alternative modes (transport), conservation campaigns (electricity, gas, water, wastewater) and government social policy (health, prisons). This is an important issue to address in the Infrastructure Plan.

Therefore, demand side management should be a principle that applies to infrastructure.

4. ADDITIONAL FEATURES OF AN INFRASTRUCTURE PLAN

In addition to the Plan providing guiding principles that the government uses to select projects and develop a regulatory environment, the Infrastructure Plan should also address the following issues:

4.1 CO-ORDINATION, INTERDEPENDENCY AND RESILIENCE

Planning infrastructure also needs to be co-ordinated across these various sectors – sectors that are funded from varying sources – by central government, local government, and the private sector. The 2004 Infrastructure Stocktake recommended to Cabinet the concept of “facilitated discussions” between infrastructure users and providers.

This could be very effective in bringing together the common issues – infrastructure development is driven by similar growth demands, in some cases infrastructure is able to share the same routes (for example, transmission lines down transport corridors), and the government could compare the best value for money of capital investment across the sectors.

Agency co-ordination is critical to achieve resilient infrastructure and avoiding cascade failures across infrastructure forms. IPENZ supports the initiative of the National Engineering Lifelines Committee to ensure that the resilience of infrastructure is more actively considered at the time that infrastructure development and renewal is planned.

Resilience needs to be addressed by infrastructure having appropriate redundancy, there needs to be effective co-ordination arrangements between organisations (pre- and post-events), end-user expectations need to be managed post-event, and appropriate measures need to be developed to evaluate backup arrangements.

This will require the identification of weak links at regional and national levels that require inter-agency and inter-sector effort. This is receiving increasing attention in other countries, with specific national cross-sector forums being established in Australia and Canada, facilitated by their governments.

4.2 WORKFORCE PLANNING

The construction of infrastructure draws on the same pool of providers (consultants and contractors) and the same pool of semi-skilled people, trades people, and highly skilled people and this highlights the need for sound workforce planning. In this respect, IPENZ would like to draw attention to the 2008 joint report by IPENZ, the Association of Consulting Engineers New Zealand and the Department of Labour on forecast

engineering skill shortages – *Engineers in the New Zealand Labour Market*. We also draw attention to the Ministry of Education’s 2008 report entitled *Advanced Trade, Technical and Professional Qualifications – Trends in Supply*.

Based on these analyses, New Zealand faces a considerable future shortage of the people resources needed and this will be a significant restraint in developing infrastructure and the contribution it will make to lifting labour productivity.

5. SECTORAL ANALYSIS AND PLANNED INVESTMENTS

5.1 TRANSPORT ROADS

5.1.1 Base Information

The information about roads is generally adequate but there is the perspective that roads are solely a conduit for vehicles. They also perform important roles as corridors for services, as a fundamental basis for urban design and space, as access to property and often as a playground.

5.1.2 Missing Issues

The following issues are missing.

- There is no reference to future oil price fluctuations and peak oil, potential liabilities arising from our future climate change emissions, or other externalities of a roading-dominated transport system.
- The current funding mechanism for road transport is failing with declined income from fuel excise and road user funds being used for non-roading activities.
- Road pricing in general and congestion (time of day) pricing in metropolitan road networks is essential if efficient use is to be made of the network. The Surface Transport Costs and Charge Study needs to be reviewed, and road pricing can also be used for reducing emissions – more effectively than the Emissions Trading Scheme.
- The government should take the lead and insist that congestion pricing be introduced in Auckland if it is serious about achieving efficiency and in reducing the need to subsidise public transport.
- There is no reference to the fact that a third of New Zealand’s roads are unsealed – highlighting the extent of New Zealand’s rural hinterland (we live in urban communities but the basis of our economy is in the country).
- The document does not refer to public passenger transport (buses).
- There is insufficient discussion on the relationship between transport and land use.
- Strategic urban issues are given little more than a passing reference yet can be of vital importance to the long-term success and competitiveness of major metropolitan areas.
- The need for true partnerships between the major metropolitan areas and central government can help achieve an efficient urban transport system but will not occur if transport investment priorities are set nationally and are separated from urban transport and land use strategic objectives.
- Recent experience in the United Kingdom clearly demonstrates that public support requires transparency on the objectives of transport schemes including the use of the revenues (toll).

- There is no recognition of the role that multimodal transportation modelling and planning plays in designing the transport networks in the metropolitan areas. This is a sophisticated planning tool that uses a range of criteria to design and futureproof a desirable network.
- There is no discussion of the freight task confronting New Zealand and the role that roads will play in meeting this challenge. The Ministry of Transport has prepared a freight study in the recent past but this has not been made public or completed. Freight volumes are expected to increase by 2.2 times current volumes by 2040 (*NZ Transport Strategy*).
- There is no reference to the environmental impacts of vehicles and their fuel efficiency – this can be improved by promoting new technologies, setting fuel efficiency and emissions standards, and setting minimum standards for biofuels compatibility.

5.1.3 Decision-making – factors to be taken into account in considering benefits and costs

Benefit-cost criteria have been used in the roading sector for many years. In particular in the 1990s they drove roading investment and this tended to favour road safety projects at the expense of congestion projects. This is the drawback to letting CBA drive investment – an overall coherent strategy is required (as discussed earlier) and CBA should be used as it was intended – as a tool for prioritisation and sequencing of projects.

Decision making is more complex, requires consultation and the government's objectives and regional objectives are different and need to be reconciled. This is because local government and central government funding is interdependent and is inextricably linked.

5.1.4 Cross Infrastructure Issues

This analysis discusses roads and rail as separate issues. From a freight perspective they are competing modes. From the urban passenger transport perspective they are not separate but are both elements of the urban transport system.

The document discusses both road and rail from a national policy perspective, without adequate recognition that they are also key components of the Auckland and Wellington passenger transport systems. The implication is that the national transport policy direction is also the appropriate transport policy direction for the major metropolitan urban areas. This is not necessarily the case.

From a national perspective, the focus is on the road network for the movement of people on land, and the road and rail networks for the movement of freight. Public transport, while increasing in importance, has a minor role. While road investment clearly influences land use development, this is generally regarded as a secondary influence.

The document's emphasis in urban areas is on relieving severe congestion and managing demand. The focus is on building roads.

5.1.5 Regulatory Constraints

There are a number legislative changes needed:

- The Land Transport Management Act 2003 (LTMA) includes the NZ Transport Strategy objectives and these are inconsistent with the *Government Policy*

Statement on Land Transport Funding, which uses the terminology: “Impacts the Government wishes to Achieve”. These are a different set of criteria.

- Section 48 of the LTMA sets out criteria for toll roads and in view of the change in government policy these are no longer applicable. This section also requires the approval of affected communities – and due to NIMBY (not in my backyard) this will effectively stop any toll roads. Also, the inability to toll existing adjacent infrastructure will inhibit toll road income.
- The provisions for concessions in the LTMA apply only to roads so they are unable to be used for bus or rail infrastructure.
- The approval process in the LTMA is essentially a two-step process and enables conditions to be set after a project has been approved and before tolling may begin.
- Section 56 (6) of the LTMA requiring that a concession agreement must not disincentivise other sustainable transport options is another significant obstacle to concessions. This also enables other parties to develop demand management strategies and undermine potential revenue.
- Section 58 (2) of the LTMA requires the approval of affected communities – communities are more likely to be concerned with the project itself rather than the concession.
- A range of legislative change is needed to implement the *Road Safety Strategy 2020*.
- The local government legislative roading provisions are still in the Local Government Act 1974 and are long overdue for revision. Draft Bills have been prepared by the Ministry of Transport in the past.

5.1.6 Defining the Service Level

Defining the service levels for roads is reasonable straightforward. There are performance measures for congestion, safety and road pavements (roughness, rutting).

5.1.7 Additional Investment Needed

There will always be additional funding required and until road pricing mechanisms are introduced it will be difficult to ration funding and match against demand.

5.2 TRANSPORT RAIL

5.2.1 General Concerns on the Rail Section

IPENZ is concerned about the lack of knowledge of the rail industry in its own right and relative to its environment (in the broadest sense of the word). There are fundamental differences between the road and rail sectors that need to be addressed if comparison is to be valid and performance optimised. The biggest of these is different accounting practice with regard to return on investment. Others are the regulatory environment and approaches to funding. Rail's wider contribution to “NZ Inc.” in environmental and other terms need to be taken into account when considering rail's worth to the country.

New Zealand should leverage off the asset it has in its rail network and invest accordingly to realise its potential. Fundamental rail needs are continued investment to address the maintenance backlog of recent years and then sustained, continuous improvement of the (freight) network in the manner seen on the highway network.

Of particular note is the totally different approach taken to the different sectors. The Sectoral Analysis on Roads adopts a remote, unquestioning stance more in the manner

of a news report than critical analysis. For example, Paragraph 79 assumes underinvestment without stating any basis. Paragraph 96 purports to comment on efficiency but its measure of this is congestion and empty roads. Measures to address congestion consider roading in isolation from the community it serves or the transport sector as a whole, with the simplistic statement that congestion can be addressed by building more road space or demand management. The established opportunity to use rail for the likes of linking ports to inland hubs does not rate a mention, nor does greater harmonisation of urban transport modes.

Some key points are as follows.

- New Zealand starts from a position where there is a railway system.
- Booz-Allen in the early 1980s and subsequently, has found against a fragmented railway (such as Auckland and Wellington as standalone metro operations, and key freight routes such as the South Island coal route).
- History also tells strongly against dispensing with less-used parts of the network and shows just how fickle transport flows can be in terms of shipping port calls, industry changes (for example, milk traffic with consolidation of the dairy industry), passenger growth such as the belated rise of Auckland metro and the rise in demand with increased fuel costs. Overseas experience also reflects factors such as these in the revival of abandoned branch lines for passenger traffic, the growth of intermodal freight, and a renaissance in passenger rail. This is not to argue against alternative models for the likes of the Napier-Gisborne line; the American short-line is a case in point.
- Reaction to the government's buy-back of first the rail infrastructure (ONTRACK) and then the rail operation (Toll Rail) indicates strong public opinion in favour of rail. In a similar vein, there was large-scale turnout from the general public to last year's events marking the centennial of the North Island Main Trunk Line. There is also established public opinion against heavy trucks and a sense of "ownership" of the rail network. Public opinion is likely to be in favour of retention of the network.
- Rail is also supported for its fuel efficiency and other environmental advantages such as its small land use footprint, ability to use local fuels, lower pollution, etc. These aspects also carry credibility that supports New Zealand's clean, green image which is vital to our tourism and product marketing.
- The consequences of rail not being there for either freight or passenger are severe in terms of road congestion, compromised road safety or the need to increase the capacity of the roading network.
- Lines that are relatively lightly trafficked have at least an opportunity value while their closure would yield slim savings as they cost comparatively little to maintain.

The IPENZ recommendation, therefore, is to leverage off the existing asset and engage to realise rail's potential. There are management models that can readily provide a strong business-led organisation while delivering a social content. (Ironically efficient use of existing infrastructure is listed, Paragraph 96, as a topic in the road sectoral analysis, but not rail).

5.2.2 Base Information

- Some of the history discussed in Paragraph 100 is somewhat tenuous and weak in providing insight into why we are where we are today. To claim the movement of people as the prime motive for a national network neglects examples such as the Wellington and Manawatu Railway Company, that was built by a consortium of local businessmen. While north-south traffic has a lower prominence than in earlier years, the comments on today's freight patterns neglect the reasons for changing

usage patterns and the reasons for those. If it is the purpose to establish history then it is deficient. If the purpose is to establish current capability then it is again deficient.

- The claim that adoption of a narrow gauge track standard has constrained the average speed of rail services ever since its adoption is a common error. Constraints on speed are predominantly curvature, clearances (for example, through tunnels), equipment capability, and network configuration (for example, signal spacing). Track gauge is not a reason for failing to develop higher speed services on New Zealand railways.

The most graphic illustration of the fact that curvature is the issue in New Zealand is that the *Overlander* passenger service, which is equipped with locomotive-hauled passenger cars capable of 100 km/h, averages less than 60 km/h over its journey, (including stops). Similarly a freight train capable of 80 km/h achieves less than 55 km/h average speed.

- Lack of traffic density is discussed in Paragraph 101. While population density is a contributor to the economic efficiency of rail, the comment is somewhat simplistic given major industrial flows are independent of urban density. On one hand, industry provides substantial traffic density independent of population centres. Examples of this are coal and milk traffics, dairy export traffics. On the other hand, the potential rail market share between population centres is not addressed. In fact, traffic increase between population centres is a potential source of growth inhibited by the factors of speed already discussed.
- The comment on door-to-door delivery in paragraph 102 is misleading in the context of modal comparisons, which appear to be the purpose of the paragraph. Road line haul and delivery are often made using separate vehicles – B-trains are not the vehicle of choice when making deliveries in Lambton Quay, for example, and freight forwarders operate large depots to facilitate freight consolidation and distribution. When such transfers are made the line haul mode is irrelevant. Overstatement of the door-to-door attribute of a road is a common mistake.
- The statement that rail “becomes economic only over long distances” lacks context and alone is incorrect. Rail’s economy comes from a combination of volume, weight and distance, but not all factors need to be maximised for rail to be economic. For example, transfers between inland port facilities or warehouses and ports are comparatively short hauls for which rail is a strong player both here and overseas.
- The purpose of paragraph 102 is unclear. The points above and the citing of freight movement statistics in this context appear to invite a road versus rail (either/or) comparison, which does not help the development of an infrastructure plan.
- The change in productivity discussed in paragraph 104 is more than just a reduction in staff numbers. Freight patterns have changed dramatically in terms of both handling techniques, such as the rise of containerisation, and the nature of the freight market itself.
- The comment that metro services crowd-out freight in paragraph 109 does not mention that there are opportunities to provide additional capacity. For example addressing the difficult single track section above Pukerua Bay in Wellington which would enable more capacity in either freight or passenger services or the two combined.

5.2.3 Missing Issues

- The strategic context for rail is not discussed nor is the most appropriate means of determining the relative priorities for rail investment.

- There is no discussion of the freight task confronting New Zealand and the role that roads will play in meeting this challenge.
- The comment has been made that there is no business case for passenger rail. Passenger rail is referred to in several places but often with the caveat that it is very capital intensive and requires high ongoing subsidies and therefore needs to be carefully assessed. There is limited recognition of the potential negative effects of excessive reliance on road investment and the use of the car. Australian cities of a similar size to (Greater) Auckland are investing heavily in improving their urban transport networks and are doing so in a way that encourages transit-oriented development and aims to reduce low-density residential urban expansion pressures.
- There has been a long history of lack of improvements to the rail network. On any road trip between, say, Wellington and Auckland there will be multiple sites where realignment to ease grades or curves are underway. By comparison the rail network has not seen significant equivalent work since the North Island Main Trunk Line reconstructions in the 1980s until the bypassing of the Kai Iwi Tunnel in 2008. The lack of ongoing, incremental work to improve the network has seen the decline of north-south freight between Auckland and Wellington because of poor transit times compared to road. Whereas the average road operator does not see any change in charges for the next realignment, the rail operator must carry the cost directly on a return on investment basis (this was the case even under Toll Rail). Continuous, incremental improvement is required to rail to realise its potential.
- The “externalities” written off in paragraph 116 are real and must be taken into account. They include many of the factors noted in overview point three above:
 - environmental credibility of New Zealand’s overseas image
 - fuel efficiency
 - sustainability and climate change (see paragraph 97 of the road sectoral analysis)
 - lower pollution
 - low impact land use
 - ability to use local fuels
 - New Zealand content in the likes of rolling stock construction
 - avoided costs in terms of road congestion and accident costs.
- Funding from fares and freight charges is an omission from paragraph 113.

5.2.4 Decision-making – the factors to be taken into account in considering benefits and costs

If economic growth and community/national welfare are the measurement criteria then it must be applied comprehensively. Paragraph 116 makes the surprising statement that there is little evidence that rail offers positive externalities and that road does not pay its full costs (it is not clear to which statement the conclusion applies, or whether to both). Given the extensive analysis published over the years, such a statement needs qualification if it is to have any credibility. The 2005 Ministry of Transport paper *Surface Costs and Charges* is one source that evaluated these factors and considers that heavy vehicles do not meet their full costs.

The means of measurement must be applied consistently. Note the different approaches to road and rail funding noted below.

5.2.5 Cross-Sectoral Issues

The freight village concept of road-fed depots and warehouses clustered around a rail head offers potential that should be recognised as an opportunity to facilitate efficient intermodal transport.

5.2.6 Regulatory Reform

Expecting a return on investment for the rail asset when one is not expected on the nation's road network is a significant disparity. It is both simpler and a better reflection of the nature of the road model to be followed for both.

Existing regulation under the Railways Act imposes compliance costs and impedances on rail not felt by competing industries. For example:

- An industry must have a rail safety case if it is to perform even basic movement of rail vehicles on its site. The same industry could be running extensive fork truck fleets and specialist plant potentially posing greater potential hazards without needing such extensive plans, audit, etc. The average industrial site should be able to manage rail activities as it would any other transport or manufacturing function, relying on the rail provider for compliant plant as required. A realignment with other industries and legislation is warranted.
- Should a contractor to KiwiRail hi-rail a new vehicle, its operation falls under KiwiRail's safety case ("license") and it must seek a variation to that safety case. The NZ Transport Agency now requires KiwiRail to consult with the trade union associated with its own staff before granting a safety case variation.

5.2.7 Defining the Service Level

Defining the service levels is reasonably straightforward for trip reliability, speed restrictions, track quality and safety, and are found in the Track Access Agreement and in the previous contracts between Toll NZ and the Rail Corporation.

5.2.8 Additional Investment Needed

As noted, rail can contribute both directly, in providing efficient transport, responsive to industry, and indirectly with the intangibles and externalities. The claims in paragraph 116 that there is little evidence that rail offers positive externalities are surprising, as there is extensive analysis of these externalities published over the years.

Funding to complete the "catch-up" on the maintenance backlog as discussed in paragraph 115 is essential and can hardly be expected to be met from revenue.

5.3 TRANSPORT PORTS

5.3.1 Base Information

The document represents a good summary of the situation that applies. Port land is generally located on expensive inner city and coastal strips, which can create its own issues with regard to economic efficiencies and can distort company returns. Costs and consent issues of relocating ports would require significant infrastructure upheaval to establish alternative road and rail feeds to support the new location

5.3.2 Missing Issues

There are development plans that have been publicised at other ports also: notably Port Otago (dredging) and Port Napier (new berth construction).

Further to the comment above about ports being generally located close to inner city areas (and residential areas), there is clearly pressure associated with the cost or ability to develop existing ports further and the increased cost of environmental compliance (refer also to point 5.3.5 below).

The Port Otago channel deepening is planned for the larger ships (6,000–8,000 TEU) in competition with Lyttelton. Port Otago has, until the recent Fonterra announcement, experienced growth in transit cargo (coastal to international). The Fonterra announcement demonstrates one issue – that large New Zealand companies dictate port, road and rail freighting. Fonterra’s recent announcement affects ports such as Taranaki, Timaru, and Otago.

Solid Energy’s decision to bring Pike River onto the Midland Rail stopped the planned growth of the Port of Greymouth whereas more coastal shipping would have revitalised the West Coast. In lieu of Greymouth spending \$20 million on a port upgrade that would have benefitted the region, Lyttelton must upgrade its coal handling facility (reclamation).

The issue with port decisions on infrastructure growth is the influence of the larger New Zealand companies, particularly Fonterra and Solid Energy, for their own commercial reasons. This may leave ports that have previously provided capital into infrastructure to service these remaining companies out in the cold, leaving them with stranded capital. The potential regional economic benefits are also ignored.

The small secondary ports and the coastal shipping issue does not seem to be referred to in the plan, probably due to insignificant benefit to the national economy despite considerable potential significance to regional economies.

Chatham Islands ports (and airports) have considerable deferred maintenance issues and a need for capital investment. The previous government indicated a capital injection of \$20 million. The Chatham Islands is of significant importance nationally but does not have the cargo to support the port (and airport).

5.3.3 Decision-making - the factors to be taken into account in considering benefits and costs

- The importance of ports to exporters.
- Many exporters prefer shipping services that ensure there is direct services to buyers overseas, rather than trans-shipment in overseas or other New Zealand ports where there may be the risk of delays in getting product to market on time and in good condition.
- The energy efficiency of using sea transport versus land transport.
- Influence, contractual arrangements, and guarantees of use by the large New Zealand companies.

5.3.4 Cross Infrastructure Issues

Road/rail transport corridors to all our ports (not just Auckland and Wellington) do need to be regarded as roads of national significance. Any congestion or delays on these routes can affect the viability and efficiency of getting goods to market.

Competition between modes for freight rather than integrated planning and service provision raises the problematic issue of government support for some modes and not others. The government needs to think this issue through to address the growing “freight task”, rather than seeing this as an infrastructure issue.

5.3.5 Regulatory Constraints

There is an expectation that the RMA consent processing will now be faster for obtaining the necessary consents for nationally important projects that ports are required to provide. Some of these are as the result of a changed shipping trend, and lead times are often tight if cargo is to be retained or new cargo generated.

5.3.6 Defining the Service Level

Service levels can be defined including return on investment, cost and efficiency of getting goods to market, and regional direct and indirect benefits.

5.3.7 Additional Investment Needed

Wharf replacement: Many wharves in New Zealand ports are under-strength to provide full flexibility to the loading of vessels using heavy plant. As the end-of-life of these wharves approaches, replacement options for these wharves and the land approaches may require significant upgrading or stronger rebuilds.

Dredging: Any move to larger vessels by shipping companies servicing the New Zealand trade will require significant investment in channel and berth dredging.

Plant replacement: Cargo- and ship-handling plant such as tugs, container cranes, forklifts, straddles and other specialist cargo-loading plant are significant investments for the port operators. Some certainty of cargo throughputs is needed to justify the expense of leasing or purchasing this plant and even the one-off cost of setting up this equipment at the port.

5.4 TRANSPORT AIR SERVICES

5.4.1 Base Information Accurate

The information provided is superficial and does not cover off the relevant issues.

For example, airports are also subject to biosecurity, immigration and security control regulations that impose very significant costs. The payments for these services are not equitably distributed amongst airports, and some existing airports are required to carry the cost of these services for other airports. Hence, it is not a user-pays framework and large distortions exist.

If an altogether new airport is developed, the degree to which it must carry these costs will greatly determine its viability. Hence, new international airports will struggle in this area unless they are subsidised or have enormous scale (unlikely).

5.4.2 Missing Issues

IPENZ believes there are a number of missing issues. For example, airport roads become public roads in order to provide access to terminals and facilities, but airport owners are unable to obtain funding from the government for the operating and maintenance costs of these roads. For some of the larger airports, these are significant costs, and airports tend to try to extract recovery for these costs via airline charges. This means that only travellers are paying, whereas there are many other users.

The demand for air travel is known to be hugely price elastic because so much of it comes from discretionary expenditure, and hence these pricing distortions only add to the problems that airline operators face.

Similarly, the allocation cost of air-space management services is not discussed.

5.4.3 Cross Infrastructure Issues

Airports are transport hubs, and Auckland Airport is the largest such hub in New Zealand. These hubs involve modal changes from air to land transport, and vice versa, and the general view is that the air side system involving airports and airlines works extremely well with capacity always matching demand. However, on the other side of the hub where land systems operate there are chronic mismatches between capacity and demand. The land transport infrastructure supporting Auckland Airport is an example where different processes are used for the land systems and severe mismatches have developed.

5.4.4 Defining the Service Level

There are a number of service level standards. The most common one for runway operations is average delay time per flight operation, and in New Zealand it is rare for delays to approach the United States' standard of less than four minutes per flight operation (except Wellington when cloud base is below circling altitude). In regard to terminal operations, the usual standard is IATA Level C, and New Zealand terminals design to this.

5.4.5 Additional Investment Needed

Within the airports systems it believed that no more investment is necessary. The problem is with supporting infrastructure on the other side of the "hub". Airports need to be seen as part of a logistics system, and not as stand alone entities.

5.4.6 Decision-making - the factors to be taken into account in considering benefits and costs

Airports and their expansions when required are subject to the vagaries of the RMA. This creates enormous cost burdens for little real gain or community benefit, despite airports being Requiring Authorities under the RMA.

The field of monopoly pricing, whether it be electricity lines or airport non-contestable assets, is hugely complex and creates highly strained relationships between stakeholders. There are enormous inefficiencies generated by the adversarial nature of pricing discussions, but IPENZ does not know of another model that may be better. To suggest new airports might be built to generate competition between airports is an absurd concept because of the oversupply, and therefore inefficient use of resources, that would result. Furthermore, airports are very long-dated assets (at least 50 years), and there must be an environment of long-term investment certainty provided to investors if capacity investments are to take place.

In regard to contestable assets, the *Facts and Issues* document is incorrect in its wording because in these areas, prices are set through normal commercially competitive processes. This means the supplier is free to extract the highest price that the market is prepared to pay, and this is the model working in these areas.

5.5 ELECTRICITY

5.5.1 Base Information

The transmission capital expenditure graph (paragraph 309) is unrealistic and has possibly been derived from the planning time for the initiation of projects and their costs, rather than a genuine cash flow forecast for each project and then aggregated. It is unrealistic to expect the construction industry to deliver the peaks and troughs as shown in this graph.

5.5.2 Missing Issues

IPENZ notes that there is no reference to the following:

- the electricity distribution network, which is vital for any infrastructure planning
- the major issues being considered in the *Ministerial Review of the Electricity Market*, that is security of supply in a dry year, changes in governance, pricing, wholesale market design and improving competition
- environmental issues – such as renewable targets, emissions and the impacts of the ETS on future generation investments
- electricity efficiency measures being undertaken by the Electricity Commission and the Energy Efficiency and Conservation Authority
- domestic demand-side measures such as the use of ripple control, smart meters and home area networks that provide energy management services
- pricing mechanisms and retailers making tariffs available for consumers that provide incentives to better manage electricity consumption including through shifting load to off-peak times and conservation during dry years.

5.5.3 Decision-making -the factors to be taken into account in considering benefits and costs

IPENZ has no comments on this section.

5.5.4 Cross Infrastructure Issues

One of the cross-infrastructure issues at present is in respect of gas. Gas is an important generation fuel and there are potentially issues to do with the optimum mix between investment in gas and electricity transmission.

There are a number of issues that the electricity industry have in common with transport. While a range of issues are being addressed in the Infrastructure Bill, there may also be scope for combined use of transmission and transport corridors and easements. There may also be some benefits for collaboration in demand planning – demand for electricity and transport are being driven by the same economic and demographic trends.

5.5.5 Regulatory Constraints

A range of regulatory interventions will be required to address security of supply issues, improve market mechanisms and to improve retail competition.

The current industry metering compliance rules and milestones should be reviewed to enable the optimal investment and deployment of smart metering technologies.

5.5.6 Defining the Service Level

The Commerce Commission has been doing considerable work on defining levels of service for distribution companies and drawing on some of the initiatives from the United Kingdom's regulatory model. However, our analysis of Transpower's annual reports shows that even though the Chief Executive has publically spoken on a number of occasions on the vulnerability of the national grid, there is no evidence of this in the key performance indicators used by Transpower.

5.5.7 Additional investment Needed

It is our assessment that over the last decade the price signals provided by the wholesale electricity market ensure that there is an adequate margin of generated supply over demand – with the exception of the dry winter problem.

5.6 GAS

5.6.1 Base Information

The information provided appears to be accurate and correct. However, the information provided stops short at transmission. Local distribution systems are the essential ingredient in supplying gas to residential and small business consumers.

The report also does not pick up the critical role of methanol manufacture (the main part of petrochemicals consumptions) in the gas sector. Methanol is a very important swing load – it can ramp up or down depending on the relative prices of gas locally, and methanol in the world market. Electricity is also a swing load but is driven by hydrological and peak load (technical) factors rather than market factors.

5.6.2 Missing Issues

There seems to be no discussion of issues at all. Crucial issues from a gas infrastructure point of view are as follows.

- The incidence, size and location of future gas discoveries. These could lead to a number of market responses depending on the circumstances. For example, small North Island-based discoveries will probably just contribute to the continuation and possibly the growth of existing markets. Intermediate discoveries in the North Island (too small to make projects such as liquid natural gas (LNG) economic) could significantly alter the existing pattern of gas usage because their development would depend on getting economic levels of uptake of gas. A major discovery off the South Island such as in the Great South Basin, would almost certainly lead to either LNG exports or perhaps a major fuels project, but the marginal cost of transporting gas north could leave the North Island markets mostly affected.
- The future of the direct use of gas, particularly the long-term prospects for residential and small business consumption, given the costs involved and the development (for example) of electricity using technologies such as heat pumps.
- The main infrastructural issue is whether the existing transmission network – especially the Maui pipeline – will continue to have sufficient capacity to service increased usage of gas. There is spare capacity at present, but if rapid growth occurred because of a medium-sized North Island gas discovery for example, transmission capacity could become an issue.

5.6.3 Decision-making – what factors should be taken into account in considering benefits and costs

Gas is not an essential service like electricity so it should be sufficient to ensure that competitive markets are operating, and leave it to the market to make any necessary infrastructure decisions. The exception to this potentially is electricity generation because electricity is a core service, but depends critically on the future role of gas in electricity.

5.6.4 Cross Infrastructure Issues

The only cross-infrastructural issues at present are in respect of electricity generation. Gas is an important generation fuel and there are potentially issues with the optimum mix between investment in gas and electricity transmission.

There may be opportunities for sharing corridors and easements with electricity and telecommunications.

5.6.5 Regulatory Constraints

The level of regulation of the gas industry is generally light handed so gas specific regulatory constraints are not an issue. However, as in other areas of the economy, the RMA currently has a big impact on investment in infrastructure. There is anecdotal evidence of RMA constraints significantly impacting on decisions to possibly expand distribution networks or to connect new customers to existing distribution systems. It remains to be seen whether the changes to the RMA will adequately address this.

5.6.6 Defining the Service Level

The service level is market driven so it is inherently difficult to define. However, the major driver is the availability of gas and the economic drive to produce new gas fields over reasonable time frames. Maui is the classic example of this.

5.6.7 Additional Investment Needed

Critical additional investment is needed in gas exploration, leading (hopefully) to commercially viable finds. The government already encourages exploration and this should be continued and preferably enhanced.

5.7 DRINKING WATER

5.7.1 Base Information

No mechanisms exist to collect data on water. Water New Zealand did an analysis of the 2006–16 LTCCPs but did not attempt for 2009–19 as the data is almost impossible to extract. It is almost impossible to get information on renewals versus augmentation spend.

Regarding water valuation it is believed that this data is likely to be wrong as there is no common framework for valuing assets, although in theory the mandating of external valuers to peer review should provide consistency.

This lack of base information represents a strategic risk for the country as government is not able to properly monitor key public health infrastructure. It also fails to address the non-local authority “public” water supplies of which there are in excess of a thousand (albeit that many are small, some, particularly rural schools, represent a vulnerable sector of society).

Capacity load factors in water supplies are often very low for a number of reasons. The first is that the design of the reticulation (except for trunk mains) is dominated by the fire fighting requirements and this function of an urban network is often forgotten. The second is that unlike other utilities, which if overloaded degrade the service to all customers, overloading a water supply network will result in complete loss of service to only some customers and no change to others. It is for this reason that water supply planners are usually “lead” not “lag” infrastructure providers. The third reason is the very large diurnal variation in demand. It should be noted that it is not only in drought but also often simply in summer that water restrictions are applied.

It should be noted that in the case of Wellington, future sources of water are being investigated.

5.7.2 Missing Issues

There are a number of missing issues as follows.

- IPENZ believes that there is a fundamental need to consider water as an economic resource. This has the effect of being able to place an economic value on drinking water abstraction and use.
- IPENZ believes that institutional reform in drinking water is required to achieve economies-of-scale and to force out incompetent operators. As many of these infrastructure-based services are managed administratively, customers have no concept of the value of the services and many think they are free. There are serious problems with pricing, parochialism, institutional arrangements and perceptions.
- Institutional reform should take a principled approach – principles include considering water as a private good, water pricing, achieving economies-of-scale and scope, the value of financial investment disciplines, providing an organisational focus, and integration of the management of the three water services. IPENZ has a number of Members who have considerable experience in analysis of industry issues and alternative structural arrangements.
- It is not correct to say that unmetered water supply and waste water are provided free of charge or subsidised. Often the opposite occurs whereby these activities subsidise other local authority activities. Just because it is a targeted rate and often a standard charge does not mean it is provided free.
- IPENZ supports the introduction of universal water metering. Most councils meter commercial and industrial supplies but apart from the Auckland, Nelson and Tauranga councils, few other councils meter domestic supplies. There is considerable evidence that metered households use 30–40 per cent less water per head than non-metered households.
- It is noted that a demand management project is underway. With water conservation, some key elements include network efficiency reporting, proactive leakage management and customer education. We have been advised that the Ministry of Health does not seem to have been invited to take part in this project even though demand management can have effects on public health (this can be by not carrying out the management and the supply fails or by methods that provide greater health risks).
- Demand management should include promoting water harvesting, including the promotion of rainwater storage tanks, grey water irrigation (with public health precautions), and using stormwater for irrigation.
- There is no mention of drinking water treatment plants as assets anywhere – just reticulation.
- In the discussion on subsidy (paragraph 193) there appears to be confusion with the drinking water standards and with the legislation's requirement to "take all practicable steps". It is the element of the quasi-mandatory compliance with the standards that rural communities do not like. The subsidy scheme is currently suspended pending review.
- In the discussion in paragraph 194 we disagree with the comment that there is debate about the appropriateness of the standards. We disagree because the standards are based on World Health Organisation standards, similar to Australian Guidelines and not as strict as European Union or United States Environmental Protection Agency standards. There is no debate from the scientific or medical

community on appropriateness of the standards. This should be reworded to say there is debate as to whether the legislation should require rural communities to comply with the standards.

- There is no mention of the role of water for fire fighting. An analysis by New Zealand Institute of Economic Research has shown that greater use of New Zealand Fire Service's *Code of Practice for Fire Fighting Water Supplies* for buildings installed with sprinklers can reduce the fire-fighting supply demand from 200 litres per second to 25 litres per second. Greater use of the code could have net present value benefits of \$15 million per annum.

5.7.3 Decision-making – what factors should be taken into account in considering benefits and costs

There needs to be a differentiation between those types of infrastructure where “lag” provision can be tolerated (such as roading) and those where “lead” provision is essential (such as sewerage). The decision-making policy section fails to address the decision-making processes of local government with its competing demands for investment, conflicting roles (provider, operator, price regulator, land-use regulator, and customer representative), constraints on determining levels of service and inadequate overview.

Given that the level of investment made by local government is at least as big as that made by central government, more attention needs to be given to determining the benefits of the intangibles associated with a water investments such as national public health, tourism etc.

5.7.4 Cross Infrastructure Issues

The current water-allocation framework completely ignores the consequential impact that allowing increased abstraction can have on receiving waters and treatment plant requirements.

5.7.5 Regulatory Constraints

There are currently over 100 acts and regulations that apply to water supply and sewerage including a number of local acts. As a result, throughout New Zealand, neither the supplier nor the customer has a clear understanding of their rights or responsibilities.

In addition, significant changes are required to the Local Government Act 2002 as follows.

- Section 136 restricts outsourcing for more than 15 years and this is a significant impediment to PPPs.
- Sections 130, 131, 134 and 135 are very restrictive to maintaining, transferring and closing down water services. These make it difficult to make manage and exit water services.
- Sections 193 and 194 are very restrictive in limiting water supply or stopping water services. These sections make it difficult to cut off water supply to recover underpayments.

5.7.6 Defining the Service Level

Service levels for drinking water are reasonably easy to define – water quality, interruptions to supply, pressure, water grading of supplies and the New Zealand Fire

Service's *Code of Practice*. However not all service levels are mandatory and reducing risk to public health will be advanced by requiring a set of minimal service levels.

Regarding the comments on water quality, the graph relates to bacteriological compliance only, which is easy to achieve. Simply chlorinate properly and sample sufficiently frequently and compliance is achieved. The main non-compliance with the standards (and related cost to fix) is in providing protection against protozoa (*Giardia* and *Cryptosporidium*) and this is where the investment is required to bring plants up to compliance with current standards. It is an indictment on the sector that 500,000 New Zealanders are on "public" water supplies that do not meet easy to achieve bacteriological compliance.

Accordingly, IPENZ believes that local authorities should be required to adopt a common national framework of water service performance indicators and these be published annually.

5.7.7 Additional Investment Needed

The real advances in public health in the nineteenth century were because of sanitary engineering. It is so essential to an economy that you forget it at your absolute peril.

There is ongoing need to continue and expand the Capital Assistance Programme – and this is for health benefits. These health benefits can be expressed in economic terms.

5.8 WASTE WATER

5.8.1 Base Information

The discussion on institutional arrangements refers to the limited number of people connected to wastewater services – this is because the cost of wastewater services is considerably more than drinking water – approximately \$3,000 per house, but cost of sewerage is nearer \$25,000 per house in small communities.

In paragraph 202, the second sentence doesn't make sense. IPENZ suspects that what was intended to be said is that plants are designed to be able to meet resource consent conditions in periods of high flow caused by stormwater ingress, not that the "high water content on peak days" enables the consent conditions to be met, as suggested by the wording.

The comment that wastewater systems appear to have more life remaining is because wastewater has always (since 1967) had regulatory control over the discharges through the Water and Soil Conservation Act 1967 and later through the RMA. In addition, water assets are typically under more duress (pressure) and there was a time in the 1960s and the 1970s where asbestos cement water pipes were widely used. These pipes typically have a shorter useful life than concrete and earthenware pipes used for sewage.

5.8.2 Missing Issues

IPENZ believes that there is a fundamental need to consider water as an economic resource. This has the effect of being able to place an economic value on wastewater discharges.

This raises the issues of funding and pricing – the differing models for funding water services and the debate over when it is beneficial to implement volumetric charging.

5.8.3 Decision-making – factors to be taken into account in considering benefits and costs

Issues that need to be considered in wastewater projects, in addition to economic benefits are environmental benefits and public health benefits. These can and have been evaluated in economic terms.

Economic instruments need to be introduced to drive efficiencies through the whole water cycle.

5.8.4 Cross Infrastructure Issues

There are relationships between drinking water and wastewater. Wastewater dry weather flows parallel drinking water consumption as conservation of drinking water reduces wastewater flows.

5.8.5 Regulatory Constraints

There are a number of regulatory constraints including the following.

- There is a real problem that the term of many resource consents is too short when compared with the design life of a plant, making sound investment decisions very difficult.
- It is not legally feasible to charge for wastewater on a volumetric basis unless it is by a council-controlled organisation. It was a recommendation of the Local Government Rates Inquiry to address this anomaly.
- Section 136 of the Local Government Act 2002 restricts outsourcing for more than 15 years and this is a significant impediment to PPPs.

5.8.6 Defining the Service Levels

In the discussion on quality, the point seems to be missed that whilst we wish to provide drinking water to a safe consistent standard, we do not have a nationally set service level for wastewater. This is because the treatment of wastewater is tailored to limit the effects on the environment and these will vary depending on where the discharge is and how the environment can cope with it.

Levels-of-service measures frequently used are discharge consent compliance, the number of sewer flooding and overflow incidents, and customer service.

IPENZ believes that local authorities should be required to adopt a common national framework of water service performance indicators and these be published annually.

5.8.7 Additional Investment Needed

Additional investment is needed for reasons of public health rather than economic growth. Significantly, greater needs and funding has been identified for extensions of the Sanitary Works Subsidy Scheme in a report to the Ministry of Health. This has previously been reported to the Minister of Health.

5.9 RURAL WATER INFRASTRUCTURE

IPENZ believes that there is a fundamental need to consider water as an economic resource. This has the effect of being able to place an economic value on water abstraction and use.

IPENZ believes in the introduction of water trading and supports the development of a statutory mechanism for the trading of transferable water shares by commercial users, including the introduction of resource rentals to cover administration of the allocation system and catchment management.

It should be noted that rural water does not only mean irrigation. There are many areas of New Zealand with very extensive rural water supplies designed for stock watering, dairy shed processing and domestic use. This has raised problems in some areas that in order to meet the drinking water standards, the whole supply has had to be upgraded including stock water.

Generally, IPENZ believes that irrigation schemes should be able to financially stand on their own and not be funded by the government. They are fundamentally different to the public health and environment aspects of drinking water and wastewater.

We suggest that flood management should be considered as infrastructure. The cross links with the water issues discussed above are unavoidable and floodwaters are part of the water cycle.

5.10 TELECOMMUNICATIONS

5.10.1 Base Information

IPENZ has no comment on this section.

5.10.2 Missing Issues

- For the fixed network, the most fundamental part of the infrastructure are the ducts (or pipes) buried in the ground. With the introduction of fibre-optic technology, these have almost infinite capacity as existing cables can be made to go faster and additional cables can be pulled through the ducts. There are similar examples, such as tower sharing, in the mobile area. This is commented on in paragraph 237. What is not mentioned is that this duct is the equivalent of a private road – the company that buries the duct does not need to (and generally does not) share this with any other provider and hence a new entrant has to construct a completely new duct in parallel to the existing one to provide a telecommunications service to customers. While this duplication of resources can be justified on high density routes such as those between cities and in built up areas, there is little justification for duplication in the residential or rural reticulation.
- Sharing of infrastructure is not just possible at the duct level – a fibre-optic cable can contain many fibres and these can be shared (called dark fibre) between multiple (wholesale or retail) customers. Again, the major carriers generally refuse to provide dark fibres (the equivalent of the electricity lines function) so a company wanting to enter the market is forced to put in an overlay network.
- Consideration needs to be given to “incentivising innovation”. Encouraging innovation will ensure that state-of-the-art technology is taken advantage of, the investment will be more cost effective and will assist in future proofing the investment.
- Four installation methods are proposed for the Broadband Initiative – deployment on telephone and electricity poles, ducting, micro-trenching and fibre-optic cable “drops”. We note that trenchless technology and conventional trenching are other possible methods of installation. IPENZ therefore considers that the estimated costs of the fibre network installations that have been prepared to date overstate the use of trenchless technologies, and underestimate the costs (for example, do not include contingencies to cover costs of consents and designations for cabling, cabinets and other structures).

- Demand side – New Zealand’s slow up-take of ultra-fast broadband services may be influenced not only by the lack of facilities but also by the lack of willingness to take up the facilities available. It is suggested that an education campaign be undertaken to encourage the up-take of ultra-fast broadband.

5.10.3 Decision-making – factors to be taken into account in considering benefits and costs

As discussed above, the issue of the duplication of ducts and fibre in residential and rural reticulation raises significant cost issues. This can be addressed by regulation as discussed below.

Additional benefits of telecommunication services that need to be taken into account are social connectedness and equity issues – relevant for rural communities, lower socio-economic groups and the elderly.

5.10.4 Cross Infrastructure Issues

The cross-infrastructure issues that arise are largely dealt with in the Infrastructure Bill. There may also be opportunities for sharing corridors and easements with electricity and gas.

5.10.5 Regulatory Constraints and Issues

As discussed above, dark fibre in residential or rural areas has many of the characteristics of a natural monopoly and this tends to be ignored in the telecommunications sector. There have been some moves in this area in more recent years, such as local loop unbundling (Telecom being forced to hire out cable pairs to their competitors) and regulation of basic bit services, but sharing at the basic infrastructure level (ducts and fibres) has not been addressed.

In order to reduce the overall cost of telecommunications, further regulation is required to encourage duct sharing and dark fibre. This will reduce the duplication of infrastructure, improve competition as costs for new entrants are lower, and there are fewer disturbances to the road carriageway.

The Broadband Initiative suggests that to reduce the costs of installation of the network, codes of practice or regulatory or legislative amendments may be needed. While these codes of practice already exist as discussed above, using regulations or new legislation to facilitate installation will be problematic. If this intended to enable widespread use of overhead reticulation, particularly where there is none now, this would upset many communities. Most district plans prohibit new overhead reticulation where there is none now.

Similarly, regulation to allow additional cables on existing overhead reticulation, or bundling of cables on existing overhead reticulation will meet with considerable opposition from communities. Again many district plans deal with this issue and they should be the preferred regulatory mechanism.

5.10.6 Defining the Service Level

Levels of service are reasonably easy to define for this sector.

5.10.7 Additional Investment Needed

The government has set aside \$48 million for rural broadband. We consider this amount too low to provide adequate services to rural areas, but recognise that in many rural areas broadband is uneconomic. However rural areas and smaller centres are a key part

of our economy, and social connectedness and equity issues arise. Rural areas will be more attractive for wireless and satellite technologies. These issues will have to be considered carefully when the government develops solutions for these areas.

5.11 CORRECTIONS

5.11.1 Base Information

IPENZ considers that the information is accurate. The plan is very dependent on the forecast number of prison beds and this is very dependent on government policy and changes in the law. The public demand for longer sentences, and attitudes to probation and community sentences all influence the number of prison beds required. There have been numerous attempts to identify alternatives to imprisonment. However in spite of this the number of people in prison has continued to grow. Therefore whether or not the corrections plan is adequate is very dependent on the government's law and order intentions.

5.11.2 Missing Issues

There is no mention of obsolete prison infrastructure. While there is some provision for replacement in the numbers, it is not specifically mentioned. Continuing to use infrastructure beyond its economic life results in additional operating costs. Uncertainty about when an asset will be taken out of service often means funds are spent on a piecemeal basis to keep it in service.

5.11.3 Decision-making – factors to be taken into account in considering benefits and costs.

There is a suggestion in paragraph 67 of undertaking social cost benefit analysis. While this is supported, there is difficulty in completing this for intangible social benefits and costs. In relation to prisons, the benefit should focus on rehabilitation, reducing re-offending and changing people's behaviour (a long-term benefit to society) rather than containment and ensuring they do not escape.

5.11.4 Cross Infrastructural Issues

Cross-infrastructural issues are not significant for Corrections. However there is a significant linkage to other social services. The level of investment in education, health and policing impacts on crime rates and the number of people in prison. The requirement for additional prison beds as a result of increasing Police numbers is often not advised to the wider public. Social services policy decisions can and do result in significant impacts for infrastructure.

5.11.5 Regulatory Constraints

Proposed changes to the RMA should assist Corrections' projects to proceed. However it is noted that the change process is slower than originally indicated. Many of the changes may not be implemented or bedded down sufficiently to benefit projects currently being progressed.

5.11.6 Defining the service level

Service levels can be defined for some aspects of Corrections activities (for example, buildings, prison escapes, etc). However defining service levels for other aspects such as prisoner rehabilitation and behavioural change is very difficult. Contracting out such services to the private sector becomes very problematic because they are difficult to specify and measure.

5.11.7 Additional Investment Needed

Corrections investment does not directly increase economic growth. However community perceptions about public safety and law and order do affect their willingness to invest. Internationally, a perception about the level of crime affects how attractive New Zealand is to tourists and investors.

5.12 MISSING INFRASTRUCTURE

The document misses some forms of infrastructure as follows.

- Flood protection systems – given that large amounts of very productive land and many urban areas are protected by such schemes and that the risk of failures is increasing this is a significant omission.
- Stormwater systems – intensifying urban development will require comprehensive stormwater systems, which on a per-meter basis, cost at least 10 times and often 100 times more to build.
- Coastal protection systems – this is likely to be an emerging issue with climate change and sea level rise.
- Solid waste management and disposal facilities.

6. CROSS-SECTORAL ISSUES

6.1 REGULATORY ISSUES

IPENZ is fully supportive of the desire to reduce regulatory barriers to more efficient infrastructure.

6.1.1 Designations

Regarding designations for infrastructure, IPENZ is concerned with the period of a designation in section 184 of the RMA and referred to this in our submission on the phase one reforms of the Act. The original purpose of designations was to indicate long-term public work requirements to property owners and the community. Under section 184, a designation lapses after five years if it is not given effect or the designation specifies a different period in the district plan (section 184). Also, an affected landowner may apply to the Environment Court for the requiring authority to acquire or lease the affected land.

Thus a corridor for national infrastructure, for example for transport or electricity transmission, can be lost for all time, either because the designation lapses or the requiring authority has insufficient funds immediately available to lease or purchase the land. For such linear infrastructure, negotiations for acquisition are likely to be protracted beyond the five years, as the designation is likely to affect many parcels of land and many landowners.

With the 20-year national infrastructure plan, the current designation provisions need to be reviewed and allow designation periods of 20 years and, in some cases, 35 years. There are good reasons to recommend that there is no need to state the period of a designation in the RMA – the need of any particular designation will be reviewed when a district plan is reviewed. Most requiring authorities with infrastructure responsibilities are now undertaking long-term planning and have a good understanding of their future needs. The designation provisions in the RMA need to protect their long-term interests.

Regarding compensation issues it is recognised that the impact on property owners needs to be taken into account, such as having a designation on their land for an

extended period, and there needs to be adequate compensation. IPENZ believes that the current designation provisions in the RMA do not adequately balance the need for long-term planning of infrastructure with the property owner's interests.

It is noted that the issue of compensation of property owners is being considered in phase two of the RMA reforms.

6.1.2 Multiplicity of Legislation

IPENZ agrees with the views of the New Zealand Council for Infrastructure Development on the multiplicity of legislation and that currently some projects trigger consents and approvals under a range of legislation. Approvals are sometimes required under the following:

- the Historic Places Act 1993 – the Historic Places Trust can set conditions for archaeological sites and these may be appealed to the Environment Court
- the Reserves Act 1977 – the Minister of Conservation has wide-ranging powers in the control and management of reserves
- the Local Government Act 1974 – road stopping (schedule 10) – if the council decides against objections, they are required to be considered by the Environment Court
- the Public Works Act 1981 – a person with interest in the land intended to be taken may object to the Environment Court.

Larger roading projects can also require building consents for each separate structure, such as bridges, culverts and retaining walls. It would be a considerable improvement to consolidate the building consent requirements for a package of “buildings” on such a project. This would require amendments to the Building Act.

Submitters can use this range of legislation to appeal against a project a number of times. This causes lengthy delays and increases costs. Therefore, it is believed that there is considerable scope for rationalisation and consolidation of legislation for all projects.

IPENZ believes that the range of legislation that impacts on infrastructure – particularly infrastructure of national significance – should be consolidated so that projects are subjected to one approval process and one appeal process. This would provide more streamlined and better integrated processes. Regarding the matter of outline consents and outline plans, section 176A of the RMA allows for an outline plan before construction commences. IPENZ believes that many Notice of Requirements for designations are required to be very detailed – the same information is required as if it was a resource consent, and insufficient use is made of the outline plan mechanism. The focus of designations should be about protecting the land for future works, and there should only be a requirement to undertake a preliminary design to support the Notice of Requirement. The detailed information and design can be provided at the outline plan stage.

6.2 FINANCING INFRASTRUCTURE

As part of the Infrastructure Plan the government needs to develop a funding strategy for infrastructure based on funding principles – these are discussed in this submission under Principle 3. Funding options include government revenue, user (or and exacerbator) pays, infrastructure bonds, government debt, and PPPs.

IPENZ would like to draw attention to a particularly balanced discussion on PPPs prepared by the Office of the Controller and Auditor General entitled *Achieving Public Sector Outcomes with Private Sector Partners* 2006.

6.3 LOCAL GOVERNMENT FINANCES

A discussion on local government finances in terms of annual rates as a percentage of GDP does not shed any light on these issues. In July 2005, the Department of Internal Affairs finalised a report, *Local Authority Funding Issues – Report of the Joint Central Government/Local Authority Funding Project Team*. Broadly speaking this project indicated that future rate increases would follow the pattern of past rate increases – with particular affordability issues in growth areas – Auckland, Bay of Plenty and Kapiti.

There was also comprehensive analysis in the *Local Government Rates Inquiry* and the background reports. In the report on the drivers for rate increases it was highlighted that the major cost drivers were transport and land purchases for recreational purposes – particularly in Auckland. Another possible reason is deferred investment finally being addressed as a result of the rigour that Long Term Council Community Plans force on local authorities to plan properly, not only for growth but also for renewals. Treasury needs to be careful about drawing general conclusions about local government finances – the costs tend to be dominated by Auckland financing needs, and do not apply to most of rural and provincial local government. Analysis has to be at the sub-national level.

What is missing from this discussion is how to improve local government's performance on infrastructure. IPENZ suggests that options could include:

- joint contracting
- share services between councils
- formation of commercial entities (council-controlled trading organisations)
- joint council-controlled trading organisations
- formation of regional publicly-owned commercial entities
- concession or franchise arrangements (long-term contracts)

This raises the issue of procurement as discussed in Principle 5 above and can relate to organisational structural options. Shared services are not necessarily the panacea claimed by many. In a report in 2007 on Shared Services in Transport – prepared for Land Transport New Zealand it was highlighted by Transit New Zealand that, in joint contracts between Transit New Zealand and local authorities for roading network management, the significant improvements in efficiency arose from the procurement model rather than the joint arrangement. Similarly, economies and scope are not always achievable. Many councils are already multi-functional organisations and already achieve economies of scale and scope. Setting up additional organisations can increase the cost structure (particularly for back office systems) and not decrease costs.

These types of changes can be very advantageous and should be explored further, but need to be developed with care and on a case-by-case basis.

6.4 DEMOGRAPHIC TRENDS

Infrastructure development is driven by similar growth demands both in terms of population and economic growth. Thus there is the opportunity for sharing of information and research between infrastructure providers and this calls for improved co-ordination as discussed earlier.

7. CONCLUSION

IPENZ appreciates the opportunity to make this submission and is able to provide further clarification if required.

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