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Executive Director
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The Treasury
WELLINGTON

Dear Sir

Please treat this as a submission on *Infrastructure Facts and Issues* (the submission is written in a personal capacity).

Economic gains are possible from well-conceived infrastructure initiatives (the thrust of the intended plan), but equally losses can be reduced by minimising the incidence and severity of failures.

Failures are likely to become more common

- many assets are aging (maintenance and renewals will become more of an issue)
- climate change adds pressure

..... and they are likely to become more costly

- failures in one sector can increasingly cascade into others given increased interdependencies
- households are less resilient than in the past and few SMEs have good contingency plans

Much of the losses from natural disasters arise through infrastructure outages

- Widespread infrastructure failures arising from overseas and New Zealand events have compromised economic and social activity, and recovery (examples range from Katrina to South Island snowstorms)
- Infrastructure risks have been prominent in New Zealand exercises like Ruauumoko and Cruickshank
- Other studies specifically note the significance of infrastructure loss as a source of general losses (the recent BERL report on earthquake disruption is an example)¹

¹ *Framework for Economic Impact Assessment of Earthquake Disruption to Wellington Metropolitan Lifelines*, BERL, September 2009.

..... but “internal” infrastructure failures (i.e. breakdowns not due to an earthquake or similar shock) are equally problematic, e.g.

- Auckland electricity failures in 1998 and 2006
- a burst water pipe in Wellington in 2006 took out CBD gas supplies for several weeks

In other words, infrastructure is an enabler when it works well and a disabler when it doesn't.

The principles in the discussion paper have the potential to address these matters

- *Principle 1* emphasises government's role to provide goods and services where the private sector is unwilling

Commercial drivers (profit, reputation, insurance signals, compensation claims etc) are insufficient to ensure an appropriate level of infrastructure resilience – the additional resilience margin has strong public good characteristics.

- *Principle 4* notes that the decision-making process should include social cost-benefit analysis and take account of equity impacts

Social cost benefit analysis would take into account the externalities that arise from infrastructure loss.

- Current infrastructure arrangements in New Zealand often take externalities into account, but unevenly. For example, community losses from electricity outages are only partly recognised in the Electricity Commission's “value of unserved energy” but congestion is much more fully taken into NZ Transport Agency's project evaluation processes²
- Stephanie Chang (University of British Columbia) has developed a methodology for inclusion of social costs and benefits in papers on infrastructure life cycle cost analysis, noting that community losses greatly exceed losses to infrastructure owners and that mitigation benefits that are not cost-effective for the provider may well be cost-effective from a societal standpoint.³

Equity is (as the paper notes) difficult to define, but it probably requires that people in like situations be treated impartially and that all have basic needs met. Infrastructure outages typically have random impacts and often fail these tests.

² For a comment on electricity arrangements, See Oakley Greenwood's Feb 2009 report to Transpower *Assessing VoLL for High Impact Low Probability Events* (http://www.transpower.co.nz/f1175,10740799/10740799_report-on-assessing-VoLL-feb-2009.pdf). The land transport evaluation arrangements are summarised in the Introduction to volume 1 of NZTA's *Economic Evaluation Manual* (http://www.smartmovez.org.nz/data/assets/pdf_file/0006/49848/Chap_2_Basic_concepts.pdf).

³ See, for example, *Evaluating Disaster Mitigations: Methodology for Urban Infrastructure Systems*, Stephanie E. Chang, Natural Hazards Review, November 2003. Dr Chang will be visiting NZ in August 2010.

A good treatment of infrastructure resilience issues is in *Managing and Reducing Social Vulnerabilities from Coupled Critical Infrastructures*, International Risk Governance Council, 2006⁴, and an outline of a programme (Canadian) to address the issues is suggested in *Working Towards a National Strategy and Action Plan for Critical Infrastructure*⁵ (other country examples are also available).

The points noted in this submission address many of the seven issues listed in para 5 of the Treasury document. I agree that welfare requires that a project's expected benefits must be greater than estimated costs (and that both should be measured comprehensively), and I consider that there are indeed some issues presently missing from the document that would assist welfare enhancements (resilience could be treated as cross-cutting).

A handwritten signature in black ink that reads "Tony Kenwick". The signature is written in a cursive, slightly slanted style.

⁴ See http://www.irgc.org/IMG/pdf/IRGCinfra_site06.11.07-2.pdf. A New Zealand version of the document would give greater attention to natural hazards.

⁵ See <http://www.publicsafety.gc.ca/prg/em/cip/strat-part1-eng.aspx>.