

RESEARCH REPORT

TRANSPORT INFRASTRUCTURE PLANNING HAS LOST ITS WAY

Geoff Edwards



‘SPAGHETTI JUNCTION’

LOS ANGELES USED TO BE THE CITY TO GENERATE SMIRKS OVER ITS CLOVERLEAF INTERSECTIONS.

THE BRISBANE SUBURB FORMERLY KNOWN AS BOWEN HILLS, HAS ALL BUT DISAPPEARED UNDER THE WEIGHT OF FLY-OVERS, FLY-UNDERS, TUNNELS AND VIADUCTS.

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TRANSPORT INFRASTRUCTURE PLANNING HAS LOST ITS WAY¹

By Geoff Edwards²

INTRODUCTION AND OVERVIEW

'Public infrastructure' is a term commonly used to describe the basic physical structures needed for the operation of a society or commercial enterprise. The traditional method of funding public infrastructure has been through public budgets.³ This imposes three powerful brakes upon over-investment in grandiose projects: strategic land use and transport planning; oversight by a multi-disciplinary, disinterested public service; and fiscal discipline at budget time.

Public infrastructure projects make a significant contribution to the economy, both in providing essential services to urban, regional, rural and remote communities and also in generating employment. Public investment is not a dead weight on the economy. Public expenditure also has multiplier effects on employment in the rest of the economy. Appropriate infrastructure creates long-term industrial capacity, so it is essential to link infrastructure planning with contemporary industry/innovation policy.

However, shortcomings are appearing in current procedures for planning and constructing physical infrastructure. In 2013-2016, Queensland, New South Wales, Victoria and the Commonwealth published several benchmark reports making the case for increased investment in infrastructure. These reports contain a number of weaknesses: neglect of climate change and peak oil⁴; closer involvement of the business sector in policy and budgeting; premature priority lists of poorly assessed favoured projects; innovative financing; and greater reliance on partnerships between the public and private sectors to bring the programs about.

This paper focusses on the infrastructure components of Queensland's [State Infrastructure Plan](#), and the Commonwealth's [Australian Infrastructure Plan](#). It argues that the reforms outlined in these documents seem likely to have the effect of breaking down that model, giving the private sector privileged access to government planning (through corporate boards); priority access to public funds (through accumulating pre-budget momentum for high-profile projects); and direct access to motorists' pockets (through user charging).⁵

¹ The views expressed in this paper are personal. They have not been endorsed by and do not necessarily reflect the policy of The Royal Society of Queensland, which is a non-partisan independent learned society, the pre-eminent generalist scientific society in the State. Nor do they necessarily reflect the views of the TJRyan Foundation. However, the analysis has been grounded in insights presented at a Community Infrastructure symposium jointly sponsored by The Royal Society of Queensland with Engineers Australia Queensland in June 2015. The intellectual stimulation provided by the presenters is acknowledged.

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³ Infrastructure refers to facilities that produce a flow of services to enable a community to conduct economic activity, usually confined to utilities of a public nature. Nationally significant infrastructure as defined in the Commonwealth Act includes: transport infrastructure; energy infrastructure; communications infrastructure; and water infrastructure; 'in which investment or further investment will materially improve national productivity'.

⁴ The date at which supply cannot be increased further to meet growing demand.

⁵ Specific publications include the *Queensland State Infrastructure Plan* (March 2016), *Infrastructure Australia's Australian Infrastructure Plan* (February 2016); *Queensland's Project Assessment Framework: Guidelines for the Assessment of Market-led Proposals* (July 2015) following the lead of the New South Wales and Victorian governments; and *Infrastructure Australia's previous National Infrastructure Plan* (June 2013).

The overriding purpose of the paper is to examine the implications of these agendas for economic development and also for the liveability of our cities. It has a Queensland focus but the principles are relevant across Australia.

The paper raises a number of significant questions about public administration, infrastructure planning and the fiscal policies of governments and, in particular, the demonstrably poor economic value added by many projects in contrast to the economic value created by alternative forms of infrastructure such as scientific research, information management, and land repair.

The evidence suggests that construction companies, road operators and funding brokers have convinced the authorities that an agenda furthering their corporate interests equates to an agenda in the public interest.

The need for greater independence

The establishment of corporate-type advisory boards in Queensland, New South Wales, Victoria and the Commonwealth and acceptance of 'unsolicited' project proposals coalesce into a trend away from disinterested analysis by the public services towards a pro-business capture of analytical capacity and policy momentum. It reflects a trend away from strategic forward planning towards case-by-case assessment with little reliance on land use plans or transport strategy. If these trends endure, the future of our cities lies in hands whose first priority is not the public interest.

While they may be 'independent' of government, by their composition, the statutory bodies Building Queensland, Infrastructure Australia and like bodies are not independent of the construction or finance sectors. In any case, there is no obvious reason why such a complex multi-disciplinary field as infrastructure planning should be independent of government. A statutory authority with a commercially-focused board cannot possibly match the range of skills and disciplinary insights that are - or ought to be - readily available within the public service.

No case has been made for establishing a body whose primary task is to prioritise 'hard' infrastructure projects. Coordination across jurisdictions and portfolios is an enduring responsibility of public service departments which are also charged with advancing the public interest. The phrase 'the public interest' does not appear in either the Queensland or Commonwealth Acts. Building Queensland and Infrastructure Australia are more vulnerable to pressure to represent industry's interest rather than the public interest.

Commonwealth and Queensland Infrastructure plans

The Australian Infrastructure Plan 2016 does not reflect Australia's vulnerability to climate change nor to disruption of oil supplies. Of 93 initiatives on its Infrastructure Priority List, only one seems to be for scientific research, even though the economic payback from research is typically ten times that of the typical multi-billion dollar road projects.

The Queensland State Infrastructure Plan 2016 is a more thoughtful and policy-rich document that shows an understanding of the nature of governance and the multi-lateral nature of a government's responsibilities. But an associated list of favoured projects does not necessarily reflect the principles in the strategy.

A detailed analysis of the two plans can be found in Appendices 1 and 2.

Opportunity cost

The paper argues that while benefit-cost analysis is a legitimate tool for assessing economic value, the fluidity of the boundary assumptions render it invalid for use in an absolutist sense. It could be a valid tool for major infrastructure if used to compare alternative destinations for public funding, including 'soft' and 'green' infrastructure. Infrastructure Australia is required by its legislation to use a method that will allow its own proposals to be compared with each other. However, it has no mandate to make these comparisons with other forms of infrastructure.

Building Queensland⁶ has a similar statutory obligation to establish a comparative assessment framework but, again, as a statutory authority situated outside the public service it cannot drive the comparisons at the early stage before momentum for favoured projects gathers pace.

It is not simply the cost to the public budgets that is of concern when multiple billions of dollars are funnelled to transport mega-projects, but the forgone opportunities to build a vibrant sustainable society and to solve public ills.

Given the rhetoric by governments of both major persuasions that cuts to expenditure are necessary to balance budgets, one would expect that the first items to be scrapped would be construction projects with a benefit-cost of less than say 3 to 1; while knowledge-based services that pay for themselves over and over again would be the most vigorously defended.

It is not clear why our governments reverse this logic by nourishing the private construction companies and starving the public institutions such as CSIRO, the Australian Bureau of Statistics, the Bureau of Meteorology, and the National Library of Australia, whose mission is to build capacity for future economic prosperity.

⁶ [Building Queensland](#) was formed in the Department of Infrastructure, Local Government and Planning in April 2015 to provide expert advice on infrastructure matters. On 3 December 2015 the Building Queensland Act 2015 came into effect, formally establishing Building Queensland as an independent statutory body. Building Queensland is governed by an eight person Board, mostly from the private sector.

A BETTER MODEL?

So what can we learn from all this? There is a better, more comprehensive model that should guide infrastructure planning. This model would resemble the one that has operated since federation and has delivered peaceful, liveable cities.

The basic ingredient is faith in the capacity of the public services to progress the public interest. That is what they are there for. The following elements of a planning framework derive not from rationalist economics but instead from the field of public administration, a much neglected field:

1. A coordinating bureau within the federal department, charged with nourishing the capacity of the states to conduct multi-disciplinary infrastructure planning; as well as advising Commonwealth ministers.
2. Under the Constitution the Commonwealth is responsible for communications but otherwise is responsible for infrastructure development primarily through tied grants to the states.
3. A protocol approved by the Council of Australian Governments (COAG) that requires all jurisdictions to avoid giving privileged access to policy-making by private sector advocates with a vested interest. Provisions would include abolition of 'business dinners' not accessible to the general public or NGOs; and abolition of committees constituted solely of business representatives as these do not broaden their members' horizons and merely entrench business orthodoxy.
4. A protocol approved by COAG that would lead to the appointment of experts in climate policy and energy security to all advisory committees and boards planning public infrastructure.
5. A protocol approved by COAG that inhibits political leaders from making political announcements ahead of full evaluation and both policy and budgetary approval.
6. A protocol approved by COAG that requires all jurisdictions to clearly separate recurrent spending (which should never be funded by debt or asset sales, and should balance over the economic cycle) from capital expenditure (which can be subject of public debt).
7. Minimum standards endorsed by all states for infrastructure planning and impact assessment that must be followed before any contribution of federal funds.
8. Publication of a draft business case as soon as it is submitted to Infrastructure Australia.
9. A standard public interest test to be applied to all project proposals and published.

The 'public interest' test

A public interest test should be written into the legislation to give it authority (and to emphasise that numbers of cranes on the horizon or construction jobs claimed is not the best measure of a project's worth). Principles that might constitute such a test include:

In evaluating projects, the Department of Infrastructure must consider whether they are in the public interest, including whether:

- the primary beneficiaries are business or commercial corporations;
- the community has expressed support for or opposition to the project;
- the project facilitates consumption of fossil fuels;
- the project will impose tolls or charges on public users;

- the project will result in avoidable costs through reduced competition between tenderers (a scheduling question) or through taking on private sector partners (a public finance question);
- the project can demonstrate high economic benefits compared with costs, and compared with alternative discretionary projects.

The Grattan Institute in its recent landmark report has laudably referred to the current 'portfolio of transport infrastructure that has too many low-benefit projects, and not enough discipline around the spending of public money'.⁷ However, it has incorrectly described the job of public servants as to 'implement the platform and decisions of the minister'. That is only half of their job. The other is to continually analyse what is in the public interest and to present that to ministers at every opportunity.

⁷ Terrill M, Emslie O, and Coates, B, [Roads to Riches: better transport spending](#) Grattan Institute, April 2016.

POLITICAL APPEAL OF BIG PROJECTS

Big transport projects are exciting. Users like them when, for example, a dozen frustrating traffic lights are replaced by a strip of uninterrupted freeway. Business likes them because they facilitate the flow of goods that are essential inputs to or outputs from their enterprises. Politicians like them because they yield quotable numbers of identifiable jobs and tangible – dare I say concrete – results for public expenditure, unlike functions such as child protection or education which have long lead times and diffuse outcomes.

Big construction projects are widely regarded as agents of economic progress.⁸ Former Queensland Premier, Campbell Newman, reflected this view in a statement he made in 2014:

In Brisbane alone there are currently 48 cranes on sites around the city which is a fantastic indicator of the confidence in the industry and the number of jobs being created.⁹

Once a new transport project is mooted, a wide range of professions and trades cooperate along well-known pathways to make it happen: industry associations, construction companies, finance brokers, engineering consultants and lawyers. So suggestions for new projects quickly gather supporters. Given the pressure that can build from all sides, governments need procedures to weigh carefully competing claims to ensure that the best value is obtained for the taxpayers' contribution.

No such powerful coalition of beneficiaries collaborates to ensure that public goods such as scientific research are adequately funded. The benefits of these forms of infrastructure are spread far and wide. The jobs they generate may not arise until years afterwards and are unlikely to be credited back to the governments who initiated them and the backroom work involved in bringing them to fruition.

Yet as drivers of future prosperity, many recently announced mega-transport projects do not come close to matching investment in public goods such as research, land repair and education. The available published figures indicate that transport mega-projects scarcely create enough economic value to be worth constructing.¹⁰ As everybody now knows, the Clem 7 and Airport Link (benefit-cost ratio: 1.1) tunnels in Brisbane could not even pay the interest on their debt after the eventual patronage was less than a third of the highly optimistic traffic forecasts.¹¹

A basic road network plays a vital role in facilitating economic productivity because it allows raw materials to reach producers, workers to reach their factories, then finished goods to reach consumers. However, the multi-billion dollar metropolitan tunnels and freeways that duplicate other roads are in a different category altogether and arguably are forms of dead-end, terminal consumption. They are likely to become the stranded assets of the future. These projects entrench Australia's dependence upon ever-increasing imports of petroleum, so stoking our ballooning private foreign debt. They disrupt orderly town planning which could design our cities more efficiently so that commuters don't need to travel as much. Pre-eminently, they suck funding and therefore jobs from sunrise sectors of the economy. Every billion dollars spent on mega-roads represents an opportunity cost of \$1 billion *not* spent on other forms of infrastructure.

Traditionally advice on infrastructure needs in general, and transport planning in particular, has come from within the public services. More recently, Queensland, New South Wales, Victoria

⁸ The Airport Link was a component of Newman's original TransApex plan when he was Lord Mayor, but it was ultimately a State government project under Labor administrations, finished only months after Newman became Premier.

⁹ *The Courier-Mail* 14.8.14; '[Campbell Newman celebrates more cranes in Brisbane](#)', *The Brisbane Times*, 14.8.14. Also search Rider Levett Bucknall crane index.

¹⁰ WestConnex in Sydney is estimated to return only 1.5 times its cost and the NorthConnex tunnel is reported to destroy economic value – benefit-cost of only 0.75. The East West Link in Melbourne could demonstrate only 0.45 but creative accounting pushed the first published figures up to a mere 1.4.

¹¹ SKM Connell Wagner. Oct. 2006. *Airport Link: Phase 2 – Detailed Feasibility Study: Chapter 16 Economic Impact Analysis*.

and Canberra have all brought external advisors from the business sector into the central corridors of policy formulation and public budgeting.

Queensland's *State Infrastructure Plan* of March 2016, coupled with the *Australian Infrastructure Plan* published in February 2016, outline the respective governments' agendas for developing infrastructure in Queensland. They are very different documents but have many features in common. Both assume that traffic in people and goods will continue to grow, despite the fluidity of emissions policy, despite the phenomenon of peak oil and despite Australia's critical vulnerability to disruption of the supply of crude petroleum from the Middle East or petrol from Singapore. Both governments have chosen to establish corporate boards with private sector directors to give 'independent' advice, traditionally the prerogative of their public service. Both plans are preambles to long lists of favoured projects, relying upon project assessment rather than strategic forward planning to confirm or deny the merits of each project. Neither plan shows much evidence of being informed by environmental science.

Neither plan includes data on the benefit-cost ratios of the favoured projects, but some reported in the previous *National Infrastructure Plan* reveal extremely poor economic 'value added' for most of the large transport projects, as explained later.

Our national government's generosity towards the construction and finance industries by way of endorsing these big projects can be contrasted with its parsimonious approach to funding scientific research. In early 2016 reports surfaced of yet more restructures within CSIRO, our peak scientific research organisation. The consequent disruption to climate science comes on top of a previous \$111 m cut over four years as part of the 2014 budget, entailing a loss of more than 400 staff. Imagine what CSIRO could develop with one percent of that amount. Not long ago, both the National Land and Water Audit and Land and Water Australia were abolished. The assault on our information infrastructure is bipartisan. Now we have water science being amputated.¹² If Australia is to generate new-economy enterprises to transition from a quarry-based economy, it must view funding such bodies as CSIRO and state government science departments as investments, not costs.

Given the pressure upon governments of both major persuasions in all jurisdictions to balance budgets, one would expect that the first items to be scrapped would be construction projects with a benefit-cost of less than say 3 to 1; while knowledge-based services that pay for themselves over and over again would be the most vigorously defended.

The questions that should be asked are:

- Are the glamorous projects good value for money?
- Are they the engines of economic prosperity?
- Should we be allocating investment capital instead to electrifying the car fleet, or decentralising population to regional towns?
- How do we deal with traffic congestion sustainability?
- Where will people live under accelerating climate change?

Given the contemporary atrophy of the disciplines of town planning, city design and science, one would never know.

CROWDING OUT BETTER PROJECTS

Economists claim that government expenditure 'crowds out' private investment. With large projects of hard infrastructure, this cannot possibly be true, because for many decades most government-sponsored construction projects have been built by private contractors. Government oversight and tender management are a minor part of the total costs. Yes, it stands to reason that taxes 'crowd out' some private spending choices. However, given that, by

¹² Haigh Bruce, '[Government negligence and Australia's water crisis](#)', *Independent Australia*, 12.3.16.

definition, infrastructure is the foundation of future economic activity. By contrast, infrastructure is the foundation of future economic activity, increased taxation spent on building productivity-enhancing infrastructure must be economically beneficial.

In any case, the Commonwealth Government's [Infrastructure Priority List](#) displays a glaringly obvious form of crowding out. Governments around the nation are being urged to 'live within their means'. This has led to cutting costs on 'soft infrastructure' such as TAFE colleges and the CSIRO, as well as 'green infrastructure' such as biosecurity and landcare. But they do not appear to be cutting back on transport infrastructure. If, as argued in this report, the hard infrastructure rests on foundations of the soft and the green, then the risk of waste, obsolescence and stranding arises. Projects rush ahead, disconnected from the roots of the economy.

Former Victorian Treasurer Michael O'Brien admitted that other public services were squeezed in favour of roads:

The reason I ran surpluses as treasurer is so I could afford, is so the government could afford to invest in major projects, including an East West Link.¹³

This admission turns on its head the lament of traditional economists that government expenditure crowds out private investment. Clearly, more than \$5 billion of public services suffered when the former Victorian and federal governments rushed to sign contracts with a private construction consortium.¹⁴ Imagine what human suffering and environmental damage throughout our nation could be repaired with \$5 billion.

The need for roads and railways arises when goods and people are separated from the places where they need to be. At least some of the massive contemporary expenditure on transport infrastructure could be avoided by the intelligent design of our cities.

Another form of 'crowding out' is worth mentioning. The very existence of Infrastructure Australia, with its dominance over nationally important infrastructure, will crowd out local 'black spot' projects by state and local governments.

'Hard', 'soft' and 'green': an interdependent relationship¹⁵

Infrastructure is usually taken to refer to the *physical utilities*¹⁶ that allow an industrial society to function, including 'hard infrastructure' such as:

- transport – roads, rail, ports, airports;
- telecommunications – NBN, telephone;
- utilities – electricity, water supply, gas;
- social – schools, hospitals.

However, hard infrastructure is entirely dependent for its existence on *soft infrastructure* (competent personnel). People, in turn, are wholly dependent upon the health of the *green infrastructure* (the environment).

'Soft' infrastructure includes:

- human capital – skills, civil society's networks;
- information – data, corporate memory, land mapping, websites;
- governance infrastructure – public institutions – the titles registry, TAFE – the public service generally.

¹³ Chalkley-Rhoden S and Farnsworth S, [East West Link: Labor accuses Napthine government of 'fraud on epic scale' over road project](#). ABC News, 15.12.14.

¹⁴ East West Link was abandoned by the incoming Victorian government, but replaced with a commitment to build the Western Distributor with a similar amount of expenditure.

¹⁵ This section is adapted from Edwards G, 'Cranes Need Solid Ground', *King's Counsel*. Brisbane: King & Co, Spring 2013.

¹⁶ Infrastructure Australia is not assigned a role for social infrastructure.

These are essential pre-conditions for any economic activity: competent people holding the appropriate roles under a government motivated by public interest.

‘Green’ or ‘environmental’ infrastructure is a system of natural assets that yield a stream of future benefits, including:

- a flow of the necessities of life – clean air, clean water, food and fibre – ecosystem services;
- amenity services that generate human capital – individual well-being, family lifestyle and civic peace;
- raw materials to supply industry and commerce – minerals, coal, gas, timber, fibre.

Proponents of major built projects can easily overlook the first two as not their responsibility; and laud the market as the source of the third. Yet these also do not manage themselves and require maintenance, or they depreciate. The more an ecosystem is pressured to provide goods and services, the more likely that the system will come to exceed a threshold of tolerance (that is, exceed its regenerative capacity and break down).

The Australian Conservation Foundation in its submission to Infrastructure Australia’s 2015 audit explained the concept of green infrastructure, but there is no evidence that Infrastructure Australia took any notice. Greening Australia even developed a model¹⁷ for Infrastructure Australia, available on Infrastructure Australia’s website, quantifying the bio-sequestration necessary to offset the construction and maintenance of built infrastructure, but this useful work is not even mentioned in the *Australian Infrastructure Plan*.

In the *Building Queensland Act 2015*, infrastructure means ‘any infrastructure in which initial or further investment is likely to have a significant economic, environmental or social impact in the State or any region of the State’. This definition is commendably broad and does not exclude soft and green forms, but it is rather circular and upon examination loses focus.

Economists recognise the ‘soft’ infrastructure as ‘human capital’ and ‘green’ infrastructure as ‘natural capital’.

If these were included in the general definition of ‘infrastructure’, the economic value they create would be better recognised and it is more likely they would be adequately funded.

Example - building a freeway

No matter how entrepreneurial, how skilled, or how cashed-up a private construction company is, building a freeway is utterly dependent upon the smooth and efficient functioning of the following public institutions:

- a titles registry that allows land parcels to be assembled (according to due process yet respecting the security of tenure of the landholders);
- the authorities that set rates and taxes to allow costs to be dispersed across the population;
- a federal Treasury that manages the currency and regulates the financial institutions that will be responsible for assembling the necessary funding;
- a technically proficient public service that will give the government reliable advice about the desirability of the project and can evaluate designs and supervise tenders once the government makes a decision to go ahead with the freeway.

¹⁷ Infrastructure Australia, [Greening Australia, Investment in Natural Infrastructure to offset the environmental impact of future development of built infrastructure](#), 2010.

These are the 'public servants' so frequently lampooned by programs like *Yes Minister*. Yet the services they provide operate so effectively, so efficiently, and have done for so long, that they are taken for granted. They don't happen by accident and they require nourishment by public expenditure, as many or most are public goods.

BENEFIT-COST ANALYSIS: STRENGTHS AND WEAKNESSES

Benefit-cost analysis¹⁸ can help to assess the opportunity costs associated with projects of calculable economic benefits.

Governments have a time-honoured propensity to curry electoral favour through pork barrelling with major projects at election time, but most voters take a more nuanced view of a government's performance. The electorate expects governments to build infrastructure anyway.

Given that benefit-cost analysis attempts to measure the economic value created by a project, it is a reasonable proxy for the extent to which an investment yields ongoing economic activity. The economics literature in this field is unsatisfying, partly because of its fixation on economic growth measured by gross domestic product (GDP) as the indicator of economic success. GDP is a backward-looking flow account of throughput in recorded markets and is useless as a measure of the preconditions for future economic prosperity. Papers explaining the distinctions between development, economic growth, prosperity and well-being are abundant in the sustainability literature but these distinctions are largely ignored in contemporary economic commentary.

However it is not unreasonable to employ benefit-cost ratios on their own terms - as rough measures of economic value potentially created.

A detailed treatment of the strengths and weaknesses of benefit-cost analysis is outside the scope of this paper, but here are comments from four eminent sources.

First, economist Amartya Sen has questioned market-centred valuation as the basis for mainstream benefit-cost analysis:

When all the requirements of ubiquitous market-centered evaluation have been incorporated into the procedures of cost-benefit analysis, it is not so much a discipline as a daydream. If, however, the results are tested only in terms of internal consistency, rather than by their plausibility beyond the limits of the narrowly chosen system, the glaring defects remain hidden and escape exposure. Daydreams can be very consistent indeed.¹⁹

Sen's paper supports the proposition that these analyses should not be used in an absolute sense but only to compare comparable projects so that at least some of their basic methodological assumptions cancel each other out.

Flyvbjerg et al offered the following acerbic summary of a study of 258 projects in 20 nations:

Cost estimates have not improved and cost escalation not decreased over the past 70 years. Cost estimates used in decision-making for transport infrastructure development are highly, systematically and significantly misleading.²⁰

The Business Council of Australia explained in a policy advisory that:

The purpose of doing a CBA [cost benefit analysis] is to allow competing policy priorities to be compared in a consistent way. ... Cost-benefit analysis can help to achieve the strategic aims of

¹⁸ A 'benefit-cost ratio' measures the relative economic value added by an investment for a given rate of interest, with benefits nominally exceeding costs if the benefit-cost ratio is greater than 1.0. Economic value can alternatively be measured by calculating the present net value (value of discounted benefits minus discounted costs under a given discount rate); or by calculating the internal rate of return (rate at which benefits cover costs). Benefit-cost analysis is based upon a comparison between a base case in which the project does not proceed and a case in which it does, over a defined period, commonly 30 years for new roads and 50 years for new fixed rail.

¹⁹ Sen A, 'The Discipline of Cost-Benefit Analysis'. *The Journal of Legal Studies* Vol. 29 (S2): June 2000, pp.931-52.

²⁰ Flyvbjerg, Bent. Holm & Buhl, [How common and how large are cost overruns in transport infrastructure projects?](#) *Transport Reviews* 23 (1) 2003: 71-88; Elaurant S & Louise J comprehensively review this theme in an Australian context in [Politics, Finance and Transport: Megaprojects in Australia](#), Australian Infrastructure Audit Submission by Jacobs Group (Australia), June 2015.

a holistic metropolitan plan by weighing up the economic, social and environmental impacts of different transport infrastructure options and identifying the best approach for the long term.²¹

The Queensland *State Infrastructure Plan* has clearly used these elements, but there appears to be no similar consideration in Infrastructure Australia's publications, such as its Assessment Framework.²²

Finally, in March 2014 the Chairman of the Productivity Commission was quoted as saying:

'Project plans are being dusted off all over Australia in the face of the new incentives for recycling capital from privatisation. We should all hope that there is more than dust being brushed off. But right now we can only hope,' he said. Quite blunt, really (for a Productivity Commission guy).

He said governments should instead be dusting down their flawed processes for deciding what projects to fund, with cost-benefit analyses done and published before announcements or election promises were made, or ribbons cut.²³

Benefit-cost ratios for hard infrastructure

The Grattan Institute in a recent landmark report has usefully summarised the strengths and limitations of benefit-cost analysis, but has incorrectly described it as '... the best tool available to support rigorous, like-for-like comparisons of potential projects' (page 16), while also (page 49) inconsistently recommending that 'governments should build all projects where the benefits outweigh the costs'. If this tool is to be used comparatively, then the projects to be built will logically be those that demonstrate the highest benefit. Also, potential uses of government funds such as soft and green infrastructure that cannot be easily quantified will always suffer if benefit-cost analysis is elevated to this level of reliability.²⁴

Benefit-cost ratios are indicated for only two of 93 projects identified in Infrastructure Australia's latest Priority List, so it is not possible to present a summary of the economic value created by these projects. One can only hope that the projects selected will be far more economically productive than the priority projects on the previous 2013 list.

In the previous plan, in the highest priority category 'Ready to Proceed', the weighted average benefit-cost ratio of more than \$16 billion worth of projects is less than 1.5, so low that one cannot be confident that it is even positive. The next highest category of 'Threshold' projects was little better: \$15.5 billion worth had a benefit-cost of less than two.

The 2016 list includes the following projects with the cost and benefit-cost ratio as estimated in the 2013 list (although the projects may not be exactly the same).

| Project (2016 list) | Cost (2013 list) | Benefit-cost ratio (2013 list) |
|---------------------------------------|------------------|--------------------------------|
| Melbourne Metro rail tunnels | \$9-11 billion | 1.2 |
| Melbourne M80 Ring Road upgrade | \$1 billion | 2.2 |
| Brisbane's Cross River Rail | \$4.45 billion | 1.34 |
| NSW Pacific Highway corridor upgrades | \$6.4 billion | 1.5 |

The International Monetary Fund has estimated²⁵ that every dollar invested in 'infrastructure' boosts economic activity by *up to* \$1.80 – the fiscal multiplier of government action. This figure matches Australian data and is probably internationally robust. Compared with the returns for

²¹ Business Council of Australia, [Cost-benefit Analysis: Policy Essentials](#). Melbourne, September 2012..

²² Infrastructure Australia, [Assessment Framework](#) January 2016.

²³ Taylor L '[Tony Abbott's grand infrastructure plan may be an expensive road to nowhere](#)', *The Guardian*, 9.3.14.

²⁴ Terrill M, Emslie O, and Coates B, Roads to riches: better transport investment, Grattan Institute, April 2016.

²⁵ Mrdak M, 'The Infrastructure Challenge', *Public Administration Today*. Jul.-Sep. 2010, p.6-11. Source: Staff of the IMF, [Note to Group of Twenty Meeting of the Deputies](#), London, February 2009.

education, scientific research, and information management, it is pathetic. Even more pathetic is the IMF's lower bound figure of 0.5.

Two case studies

Two case studies are mentioned to show the weakness of the economic case for some of the signature road projects.

- **WestConnex (New South Wales)**

The website for the WestConnex project shows that the cost at March 2016 was \$16.8 billion, with a benefit-cost ratio of only 1.88 - including wider economic benefits such as saving commuters' time, and productivity gains for freight operators.²⁶ It is not clear how much of the funding will come from taxes and how much from tolls. The website shows less than \$5 bn from taxpayers: \$1.8 bn from New South Wales, \$1.5 bn from the Commonwealth and a concessional loan of up to \$2 bn.

The website also states:

WestConnex is being funded through an innovative financing strategy, which involves asset recycling.

'Asset recycling' is code for selling off publicly-owned assets, many of them 'public good' monopoly infrastructure and using the money to fund new projects. It would only be true 'recycling' if all the money from the sale was reinvested in comparable 'public good' infrastructure that would not be provided by normal budget procedures.

Once these funds are spent - either on projects (like new schools or hospitals) that would otherwise be funded from the contemporary capital works budget - or on building a facility that delivers cash flow to a private operator, they are respectively the equivalent of selling the family silver to fund current outgoings, or giving the family silver away to private investors.

Prof John Quiggin has lucidly explained that the public pays for toll roads, one way or the other.²⁷ There is no free lunch and the electorate knows it.

- **East West Link (Victoria)**

Melbourne's East West Link project provides a particularly bizarre example. We now know that the thorough benefit-cost analysis demonstrated a ratio of only 0.45. But the proponents were able to nudge the figure up to 1.4. While this figure became known publicly, no business case was published before the contracts were signed.

We know that East West tolls were estimated to return only about \$1.2 billion of the \$6.8 billion cost, with the remainder presumably coming from taxpayers. We also know that the former government declined to submit the business case to Infrastructure Australia, presumably because the case was too weak. Nevertheless, it obtained a funding commitment of \$3 bn from the Australian government. Contracts to commence work were signed just a few weeks before the November 2014 election. The contract was accompanied by a letter guaranteeing compensation to the consortium in the event that the project might be cancelled.²⁸

Commentator Bernard Keane wrote:

On a league table of worthwhile projects, East West Link is a wooden spooner.²⁹

²⁶ <http://www.westconnex.com.au/about/index.html>, 1 March 2016.

²⁷ Community Infrastructure forum, Royal Society of Queensland, June 2015.

²⁸ Liberal Party of Australia, '[Melbourne's East West Link to Become Reality](#)', media release. 29.4.14.

²⁹ Keane B. 'Abbott presides over a lost year on infrastructure', *Crikey*, 6.6.15.

And that is without considering the opportunity cost of the public financial contribution, which should have killed this project at birth.

The incoming Labor Government in Victoria has been accused of fostering sovereign risk. This is an invalid criticism given that the Labor Party's commitment to cancel the contracts if elected was well publicised before they were signed. In this case the Andrews Government can legitimately claim it had a mandate to cancel the project. The Government chose to pay compensation for breach of contract. The quantum reveals the grubby underbelly of public-private partnerships. It seems that \$339 million of fees were payable in the few weeks after contracts were signed prior to any serious commencement of the project.³⁰ These seem to be upfront fees collected by the financiers and brokers who under traditional contracts, let by competitive tender, would have had a minor and largely invisible role. So much for private sector efficiency.

Stung by fierce criticism from the Murdoch press over honouring its campaign promise, the Victorian Government then over-eagerly entertained a substitute market-led proposal from Transurban and financial brokers to build the Western Distributor at an estimated cost of \$5.5 billion.³¹ It has been suggested that this project will simply funnel cars into the CBD through Transurban's toll gates, so will worsen congestion.³²

Benefit-cost ratios for 'soft' and 'green' infrastructure

There are numerous case studies in benefit-cost analysis, but comparing them is fraught with risk. Analysts adopt different boundary assumptions and methods and sometimes reveal conflict of interest. Calculating benefits, especially intangibles to parties not involved in the transaction such as wider society, is risky.

Some studies consider only economics, others attempt to introduce non-quantitative parameters through proxies.³³ There are particular risks in citing overseas studies as other countries have different socio-economic and regulatory settings. Nevertheless, if benefit-cost analysis is at all legitimate, it ought to be robust enough to accommodate these risks (albeit with provisos).

It is easy to find studies demonstrating large benefit-cost ratios for investment in soft and green infrastructure. It is much more difficult to find cases in which governments have taken advantage of these studies at budget time.³⁴

A single comparative study, by the Productivity Commission in 2007 is sufficient to demonstrate that investment in scientific research and development eclipses large civil construction projects by as much as an order of magnitude.³⁵ Some 75 case studies demonstrated an average benefit-cost ratio of 12.4. Only 19 had a benefit-cost ratio of less than 3.0. Few of the multi-billion-dollar transport projects on the *National Priority List* of Infrastructure Australia rise as high as 2.0.³⁶

³⁰ Lucas C and Gordon J., 'Victorian government settles East West Link claim for \$339m', *The Age*, 15.4.15. The quantum is controversial. The Victorian Auditor-General in Dec. 2015 reported a figure of \$1.1 bn but this includes the value of properties that remain saleable assets.

³¹ Mayne, Stephen. 4 May 2015. 'Mates pass baton as Transurban proposes East-West alternative', *Crikey*. Mayne notes that the Western Distributor would increase the value of the privatised Port of Melbourne, increasing the sale price and presumably cornering the Victorian Government into building the Western Distributor to avoid paying compensation to the new port owners. Essay question: Discover the public interest in all of this.

³² Davidson, K, 'How Dan Andrews and Transurban are stuffing up Melbourne's inner west', *The Age*, 25.1.16.

³³ Edwards G, *Political Arithmetick: problems with GDP as an indicator of economic progress*, Encyclopaedia of Life Support Systems, UNESCO, Paris, 2004.

³⁴ See Appendix 4 for a tabulation of a number of significant studies.

³⁵ [Public Support for Science and Innovation](#), Productivity Commission, 9.3.2007.

³⁶ To clinch this argument and to examine the value added by expenditure other than on scientific research, this and a few other studies are tabulated in Appendix 4. Some research projects demonstrated benefit-cost ratio in the hundreds. Expenditure on weed and pest animal control can easily be shown to return 100 or more times its cost.

A particularly notable and disciplined Queensland study was by Sanders who demonstrated benefit-cost ratios of 45-140 for systematic land resource assessment, which steered development away from problematic sites.³⁷ The cost of not funding land mapping far exceeds the cost of doing it. Yet this backroom work has, for year after year, been neglected at budget time.

In no wise is it argued that benefit-cost ratios should be the primary determinant of budget allocations. Indeed, governments are expected to allocate money for functions that are in the public interest which by definition is disconnected from commercial returns. Nevertheless, the table in Appendix 4 should give decision-makers cause to ponder. No infrastructure project with a benefit-cost ratio less than say 3.0 should receive funding unless there is an overwhelming case based on non-economic public interest. This criterion cannot be satisfied by any business case prepared by a proponent.

In 2001, the Business Leaders Roundtable published a landmark report arguing for investment by governments over 10 years to leverage funds from the private sector for a comprehensive program of land and water repair.³⁸ The Roundtable was comprised of the Australian Conservation Foundation, CSIRO and businesses Southcorp, ABN AMRO, Berri, Elders and Macquarie Bank. The study found that a modest approach called 'Progress with caution' requiring no new public institutions would attract private sector investment of \$5 bn over ten years in return for a government allocation of \$2.4 bn, a leverage ratio of 2.08. The 'Strong leadership' approach requiring some amendments to financial and policy structures could leverage \$12.7 bn of private money for a public investment of \$3.6 bn, a leverage ratio of 3.47. The leverage ratios are not exactly benefit-cost ratios, but are parallel indices. Few of the major transport projects on the previous Priority List reach even 2.08 benefit-cost ratio, and the amount of \$3.6 bn is small change compared with total federal funding for transport infrastructure even if brought forward to a single year. Yet this substantial report vanished without policy trace.

Scientists despair at the money being poured into multi-billion dollar transport projects while funding for land repair, scientific research and environmental protection is squeezed. And anybody, even a narrowly-trained economist, who believes that innovation is the driver of economic growth, must scratch their heads at the abolition of the Australian Learning and Teaching Council³⁹ or the 'efficiency dividend' of \$6 million demanded of the National Library in the 2016-18 budget, which threatens the search engine Trove and the web archive Pandora. The National Library 'has faced cuts for 27 years straight'.⁴⁰ Truly, this penny-pinching is not efficiency but is taking an axe to the roots of infrastructure. Trove, for example, indexes nearly 500 million Australian and online resources and delivers 20,000 searches within a typical hour.

The funds required to restore the National Library's budget to the previous year's already lean level would require the national government to pause its contribution to the WestConnex road by *a single day*. Truly, perspective has been lost in our nation's building infrastructure agenda.

³⁷ Sanders R, 'Benefit/Cost of Land Resource Assessment: The Leichhardt Downs (Burdekin) Study'. *Resource Planning Guideline E51*, Brisbane: Department of Natural Resources & Mines, 2.6.05.

³⁸ The Allen Consulting Group, *Repairing the country: Leveraging private investment*. The Business Leaders Roundtable, August 2001.

³⁹ Lane, B, 'Australian Learning and Teaching Council closure contributes to \$8.9m deficit', *The Australian*, 18.5.11.

⁴⁰ Seselja, Zed. <http://www.abc.net.au/news/2016-02-11/senators-urge-federal-government-to-fund-institutions/7160370-11.13.16>. Also see Belot, Henry. 22 Feb. 2016. <http://www.smh.com.au/national/budget-cuts-will-have-a-grave-impact-on-the-national-library-staff-told-20160222-gn0co2.html>.

THE DANGERS INHERENT IN DEPENDING ON UNSOLICITED PROPOSALS

If there is anything worse than a road mega-project that does not create or barely creates enough economic value to justify the cost, it is an unsolicited project put forward by a construction company or broker with a financial interest. Such proposals now being considered by governments in the eastern states suggest that the entire disciplines of transport planning, city design and land use planning are worthless, and several decades of endeavours by engineers and planners in strategic and infrastructure planning have been wasted.

Queensland Treasury is establishing a secretariat to receive what it euphemistically calls 'market-led proposals', being projects that a commercial company thinks can be profitable, but that the government has not previously considered. This follows similar moves by New South Wales and Victoria.

The Queensland initiative was announced by the Premier in September 2015⁴¹ and explained in a Treasury guideline *Project Assessment Framework*.⁴² The provisions appear in the *State Infrastructure Plan* launched on 13 March 2016.

New South Wales has a process for 'Unsolicited Proposals' which identifies the Department of Premier and Cabinet as the recipient of proposals rather than the relevant line agency.⁴³ Proponents are encouraged to arrange a pre-lodgement meeting before making a formal submission. Journalist Michaela Whitbourn has showed that this is a significant pro-business shift from the previous process announced in 2006 when proponents were required to obtain the support of the line agency which was responsible for examining it in depth.⁴⁴

The failures of many prominent private-public sector partnerships, meticulously documented by Elaurant & Louise⁴⁵ and Quiggin⁴⁶ should have dimmed our governments' enthusiasm for stripping away the limited safeguards that applied in those cases.

It is worth quoting the first recommendation of the Productivity Commission in the section 'Principles for good governance' in its landmark 2014 report on public infrastructure.

RECOMMENDATION 7.1

All governments should put in place best practice institutional and governance arrangements for the provision of public infrastructure. This includes:

- clearly defining the principal objective of **ensuring that decisions are undertaken in the public interest, taken to be the wellbeing of the community as a whole;**
- setting clear and transparent public infrastructure service standards;
- instituting effective processes, procedures and policy guidelines for **planning and selecting public infrastructure projects**, including rigorous and transparent use of cost-benefit analysis and evaluations, **public consultation**, and public reporting of the decision. (emphasis added).⁴⁷

⁴¹ Passmore D, 'Premier calls on private sector to pitch infrastructure projects', *Courier Mail*, 23.9.15.

⁴² Queensland Treasury, [Project Assessment Framework](#), July 2015.

⁴³ New South Wales Treasury, [Working with Government: Guidelines for Privately Financed Projects](#), December 2006.

⁴⁴ Whitbourn M. 1 'How the policies compare', *The Australian Financial Review*, Nov. 2012.

⁴⁵ Elaurant S & Louise J comprehensively review this theme in an Australian context in [Politics, Finance and Transport: Megaprojects in Australia](#), Australian Infrastructure Audit Submission by Jacobs Group (Australia), June 2015.

⁴⁶ Quiggin J, [Private infrastructure finance and secular stagnation](#), Quiggin blog.

⁴⁷ Productivity Commission, [Public Infrastructure Inquiry Report](#), No. 71, vol. 1, May 2014, p.281.

The Productivity Commission's report shares some of the weaknesses in Queensland and national infrastructure plans, including placing too much faith in the private sector, supporting user-charging and playing down the consequences for transport infrastructure of fuel security and climate change.

However, in this first principle of governance, the Commission hit the target and has lucidly expressed the fundamental principles that should underpin infrastructure planning.

Leaving the private sector to lead infrastructure planning is highly unlikely to meet these goals. If project selection leads rather than follows strategic planning, the abuses and misallocation of capital hinted at by the Productivity Commission and enumerated by Elaurant & Louise will continue undiminished. From the point of view of a scientist watching global temperatures rise, the Productivity Commission's report is too minimalist. Unsolicited proposals do not satisfy even its minimum standards.

Bypassing strategic planning

A private-sector model of governance turns on its head the traditional way that hard infrastructure has been selected, endorsed and funded.

Traditionally, the public service would conduct a thorough investigation before compiiing a regional, infrastructure, or local government planning scheme. These plans would normally be exposed to public consultation before being submitted for Cabinet approval. Project proposals would then be generated from it. There would be inter-departmental consultations during which priorities would be evaluated, benefits compared, negative side-effects anticipated and feedback sought from experts or consultants. In due course, Cabinet would be presented with a 'merits' submission. In the case of big projects, there might be several successive submissions.

Before the annual budget, departments would submit funding bids through Treasury to the Cabinet Budget Review Committee. So Cabinet decisions on the strategic plan or the merits of the project would precede and be separated from the funding decision. At that point, the Government would decide on its funding priorities.

But the construction industry appears to have been reluctant to take its place in the queue. The common pattern these days is for projects to bypass all of the strategic assessment processes and be granted a direct champion embedded inside Treasury (Queensland) or Departments of Premier and Cabinet (New South Wales and Victoria).⁴⁸

Arguably worse than a conduit that bypasses strategic planning is a process that doesn't envisage comprehensive land-use-based planning at all. The new Assessment Framework adopted by Infrastructure Australia envisages a five stage process commencing with the nomination of a project by a sponsor.⁴⁹

A process that encourages private companies to take the initiative, run their own benefit-cost analyses, conduct their own option studies and then gain the imprimatur of a business-focused board is destined to end in trouble, if not scandal, but only after large sums of private and public investment capital are wasted and the shape of our cities is changed forever.

No amount of project-specific impact assessment *after* an application has gained momentum can substitute for careful strategic land use and transport planning on a broader canvas, and in the early stages. No road or railway or pipeline can be built without ripple consequences for the cities and the operation of other utilities, and the unsolicited process limits the opportunities for airing alternative solutions for the problem that the project is supposed to remedy.

⁴⁸ Having said that, the institutional arrangements in the three states are different and the degree of independence from the private construction sector and from government also varies between the states.

⁴⁹ Infrastructure Australia, [Assessment Framework: Overview](#). Australian Government, January 2016.

The challenge for planners

Australia faces a challenge of daunting proportions to accommodate its population growth.⁵⁰ If the economists in Treasury believe that they can meet this challenge by turning city planning over to construction firms, they have not been reading five decades' worth of planning reports, which make clear that a city cannot build its way out of congestion by constructing roads.

Queensland embraced regional planning later than New South Wales and Victoria, but even in Queensland, we have experienced twenty-five years of regional land-use plans, since the reforms of the Goss Labor government launched regional plan *SEQ 2001* in 1990.

It is fashionable to ridicule town planning procedures as 'green tape' – a barnacle upon progress. But in all states the local and regional planning regime has been built painstakingly over decades for a purpose - in order to:

- secure private property rights
- safeguard the public interest
- guide prudent decisions about what ought to be built and where
- ground civil construction projects in strategic land use considerations, and
- steer governments and business away from foreseeable mistakes.

Unsolicited proposals threaten all of those protections.

⁵⁰ Colebatch T, '[Australia's urban boom: the latest evidence](#)', *Inside Story*, 5.4.16.

CASE STUDY: REGIONAL LANDSCAPE PLANNING

The fate of one element of *SEQ 2001*, regional landscape planning, offers a case study in how easy it is to destroy human capital and green infrastructure while chasing signature construction projects, to the eventual detriment of all forms of infrastructure.

In 1993 a regional open space system in South East Queensland was promoted in the discussion papers behind the *SEQ 2001* regional plan. This idea was based partly on grounds of environmental protection and amenity/liveability. But there were two significant economic justifications. One major justification was the economic enterprise (notably in eco-tourism) that could be generated by providing public parkland with appropriate investment in land improvements, facilities development, and maintenance.

Another major justification was that the property and infrastructure development industries would be well served by broad-scale landscape planning that identified the main areas of the region that should be left green (the ridge lines and river valleys in particular). These are pivotal for identifying the best routes for infrastructure corridors. Landscape planning also identifies 'no-go' areas such as flood plains, deposits of acid sulphate soils, patches of high-value biodiversity and other unsuitable areas. Comprehensive land use planning offers the development industry the certainty for which it so often pleads.

From 1994 the newly established group within the Queensland public service responsible for open space planning was subjected to repeated organisation restructures and budget cuts. In 2012 this Regional Landscape Unit's attempts to achieve a credible regional open space system succumbed to the Newman Government's re-definition of land-use planning as economic development. Redundancy advice consisted of staff being presented with cab vouchers to expedite an immediate exit, some staff having served governments of both major persuasions faithfully for 15 years.⁵¹

The lack of competence in linking a regional open space network to transport planning, natural resource management planning, outdoor recreation planning, planning of productive agricultural lands and peri-urban planning generally was evident to any one of the stakeholders of the unit's Regional Landscape and Open Space Advisory Committee. But members of the committee, some of whom had worked on the regional open space agenda for almost 20 years were sidelined ... no-one bothered even to face them with the news that their decade-long struggle was coming to an end.

Twenty years after establishment of the original iteration of an open space system, Queensland still lacks a functioning network of corridor-defining regional open space and the public service now lacks the professional staff capable of advising even whether such a system is desirable.

Distorting public budgets

Projects in regional and remote areas are likely to be under-provided by market-led proposals. They are rarely commercially attractive. Small local projects will be under-provided unless they can attract the attention of a private sector sponsor. Local contractors generally lack the experience necessary to draft unsolicited proposals and shepherd them through the bureaucratic hurdles. The new arrangements will favour large national construction companies and financiers.

Market-led procedures will distort public funding decisions: they are likely to lead to over-emphasis on construction projects that can deliver cash flow to private operators. Toll roads qualify. This is admitted for example in the Queensland Government's 'Better Planning for Queensland' Directions Paper which explains that the government wants to investigate the merits of 'funding mechanisms that better align infrastructure funding with revenue from its beneficiaries (e.g. value-capture measures, user charging)'.⁵²

⁵¹ See 'The purge of the public servants (2012)' in Scott A (ed), [The Newman Years: rise, decline and fall](#), TJRyan Foundation, February 2016.

⁵² Queensland Government, [Better Planning for Queensland](#), May 2015.

'Value capture' is a classic example of the language George Orwell⁵³ deplored in his essay on politics and the English language deplored. It is a euphemism giving development rights over adjoining land to construction companies so they can profit from windfall rezonings or otherwise non-conforming development approvals. If an unsolicited proposal falls comfortably within current planning guidelines, then there may be a modest windfall associated with the improvement to land values on account of the project. Government captures a percentage of this increase in value through land tax and municipal rates. The big windfalls however arise when a proposal requires rezoning or relaxation of current development controls. The increase in property values is captured by the proponent but really belongs to the community which has created value through the rezoning or project approval process.

'User charging' is another fudge term which implies dispensing with the checks and balances inherent in public collection of tolls and granting construction companies and their financiers a guaranteed source of cash flow imposed directly upon motorists. 'Outsourcing of taxation' might be a more accurate description.

Deriving from proposals by proponents, the model of unsolicited proposals is a project-by-project one. Published guidelines in Queensland and elsewhere claim that projects will undergo rigorous benefit-cost assessment. Benefit-cost analysis is a project assessment tool not a strategic planning tool. The model obliges the recipient government to consider the analysis in absolute not comparative terms, as the proponent is not responsible for the wide range of alternative projects that might be competitors for the capital required. Comparisons with expenditure on libraries, scientific research, public hospitals, preventative policing and so on during budget deliberations are neglected. Opportunity cost is not factored in.

This will apply, even if the proposal is a full private-public partnership with no direct outlays from the public budget. The opportunity cost of investing our society's design capacity, engineering capacity, financing capacity, land, cement and petroleum into sub-optimal projects is substantially more significant than the direct fiscal cost.

So projects that suit the interest only of the facilitators, consultants or construction companies and not the public interest can bypass good governance. This is a taking a wrecking ball to the general economy.

Benefit-cost analysis addresses primarily the economic value of a project which is only one of the parameters that need to be satisfied, but the full range of parameters cannot be assessed by a proponent because they require much more comprehensive *public* policy analysis, which can be conducted only by government as only government can grant legitimacy to strategic plans.

Market theory inadequate again

It is conventional wisdom that markets impose tough discipline on corporations because shareholders' money is at stake. But a modern private sector partner is not a single company using its own funds, as envisaged by early economists. Modern corporate structures separate risk from reward. Most of the brokers and contractors involved in big construction projects take their money and go before the eventual financial success of the project is revealed. The infrastructure industry is disaggregated into assemblers, facilitators, financiers, consultants, super funds, head contractors, subcontractors, international investors and other players, all with distinctive roles which allow them to insulate their source of profit from risk. Remember the traffic forecasts for Airport Link Brisbane and the upfront fees sucked out of the East West Link project as soon as the ink was dry on the contracts. There appear to be few brakes on gold-plating (designing costly and unnecessary features or refinements into a product or structure) of projects when there are remote investors with a broad appetite for infrastructure projects.

By contrast, proposals that rely upon 100 percent public funding are automatically subjected to the fiscal discipline that governments apply to themselves under the threat of ridicule from the financial press (or the electorate). This turns the conventional wisdom on its head.

⁵³ See George Orwell's essay, '[Politics and the English Language](#)', 1946. Orwell believed that often political language used was necessarily vague or meaningless because it was intended to hide the truth rather than express it. This unclear prose was a 'contagion' which had spread to those who did not intend to hide the truth, and it concealed a writer's thoughts from himself and others. (See also [Wikipedia](#))

Under the prevailing neo-liberal (economic rationalist) orthodoxy, the destination of private capital is notionally left to the private sector. The differentiation is false. Governments are capable of treating private capital with disdain. Anna Bligh's Treasurer, Andrew Fraser, called Brisbane's Airport Link tunnel a 'zinger' of a deal for taxpayers although it lost more than \$3 billion of private capital.⁵⁴ The Queensland community is the loser if it allows its investment capital to be applied to inefficient and potentially stranded projects. Efficient allocation of capital requires prudent oversight and analysis by both private and public sectors.

By approving of a project, the government is endorsing development at that site, is potentially diverting investment capital from rival products or sites, is committing itself to a program of ancillary infrastructure to support it and is investing the human capital of its public service to implement the commitment made.

Traditionally, private sector partners were confined to earning their profits on the basis of their own investment of capital, labour and materials – 'return on investment' pricing. Nowadays, public-private partnerships open up the prospect of windfall profits beyond return on investment. These profits come at the expense of others: taxpayers, bank depositors, shareholders of victim companies and so on.

⁵⁴ 'Airport Link Tunnel a 'zinger of a deal' for taxpayers, says former treasurer Andrew Fraser' *Courier Mail* 25.2.13. This must have been the Treasury line. Campbell Newman made the same statement in Parliament.

UNDERPLAYING CLIMATE CHANGE AND THE PRODUCTION LIMITS OF OIL

Two significant future environmental threats not sufficiently considered in the national report (and in the Queensland equivalent) are climate change and 'peak' oil.

Climate change

There is a wealth of evidence that demonstrates the reality of climate change. Global climate indicators are now deteriorating more rapidly than under the worst scenario of the cautious Intergovernmental Panel on Climate Change. Temperature records are being broken repeatedly and with news that methane-saturated bogs in Siberia are now boiling it is quite plausible that the planet has already passed the tipping point at which change is accelerating beyond remedial control. Climate change requires a crisis-level response. Given the contemporary lack of sufficiently potent policy settings, there is an increasing need for 'independent' advisers to argue the case for urgent action in their reports, as a service to governments and the construction sector.

What happens when Australians can no longer afford the oil?

'Peak oil' – the date at which it is not possible to increase the supply of fuel any further to meet growing demand – is an intertwined problem of economics and geology. Economics can slow or hasten the rate of extraction of a non-renewable resource up to a point; but it cannot hasten the rate beyond that permitted by the geological formations.

Economists have tended to dismiss the notion of peak oil, arguing that as a resource becomes scarce, the price will rise. This will automatically ration the oil and stimulate the discovery of substitutes. The notable slump in global price in 2015-16 seems to have contradicted those who predicted inexorably rising prices presaging the terminal decline in production.⁵⁵ However the trajectory of prices, from above \$US110 to below \$US40, invalidates the economic proposition that prices will reflect scarcity. Clearly there is a more-or-less complete disconnect of the international market from the underlying geological resource.

It is likely that price signals did indeed constrain demand in the aftermath of the global financial crisis and were a factor in the financial collapse of road tunnels in Brisbane and Sydney. The problem is the forward lag time. Price signals will kick in at or after peak, because until then, by definition, supply can be increased to meet demand. The peak will be recognised when it is too late to unwind physical infrastructure built on the assumption that there will be no shortage of supply. Engineering for a world in which petrol and diesel are expensive should have started three decades before the oil peak, because of the lifetime of physical assets that anticipate volumes of traffic.

It is difficult to pin down when oil supplies will peak. Data from the Middle Eastern OPEC countries are unreliable, and definitions vary between observers. Wight and many others have claimed that global production of conventional oil (excluding variants such as condensates from gas plants) peaked in 2006.⁵⁶

The shale oil program in the United States and production from Iraq and Iran have probably flattened the peak and may have pushed these dates forward by a few years. However, the resource is not renewable. It is quite clearly depleting. Even the most optimistic economists have conceded that production will have peaked by 2035. For example, the Australian Government's rose-coloured 2012 *Energy White Paper* predicts that 'physical production limits (so-called 'peak oil') are unlikely to be reached before 2035'.⁵⁷

⁵⁵ Edwards G, 'Political Arithmetick: Problems With GDP as an Indicator of Economic Progress', *Encyclopaedia of Life Support Systems*, UNESCO, Paris, c.2004.

⁵⁶ Wight W, 'Peak Oil or Peak Investment: What does it mean for energy security', [Royal Society of Queensland](#). June 2015.

⁵⁷ Australian Government [Energy White Paper 2012](#).

Sceptics believe that large resources of unconventional oil such as tar sands in Canada, and oil shale near Gladstone and elsewhere, can be used to supply petroleum fuels. These (admittedly large) resources will not become available quickly enough to affect the timing of peak. This is partly because they will fall foul of global carbon initiatives; and partly because the energy return on investment is too small. The opportunity cost of burning natural gas and diesel fuel to extract oil with an 'energy profit' of only two or three to one is too great. Transport planners will have to seek better solutions.

Blame for the lack of official awareness of the problem of oil peaking can partly be laid at the feet of the International Energy Agency (IEA) which, until about 2010, modelled consumption to grow steadily. Under heavy criticism from petroleum geologists for ignoring the evidence IEA's Chief Economist Faith Birol⁵⁸ conceded that conventional oil probably peaked in 2006.⁵⁹

What does the threat of oil peaking mean for infrastructure planning?

Much of the hard, concrete construction identified in Infrastructure Australia's national plans is permanent and will shape what our capital cities will look like and feel like forever. Even if motorists do not receive price signals until 2035, it is already well past time to plan infrastructure accordingly. Given the government's neglect of a phenomenon that will have profound consequences for transport infrastructure, if Infrastructure Australia is truly independent, it should be able to provide frank warnings about this challenge.

Furthermore, investors should take note. Toll roads (like car-dependent shopping malls) are likely to be the 'stranded assets' of the 2020s. Profitability of high-cost toll roads depends on continuous, exponential expansion in the volume of traffic numbers. Even now, without a carbon price on petrol, it isn't happening.

⁵⁸ [Dr Fatih Birol](#), ABC *Catalyst*, 2011.

⁵⁹ Herbert, B, [Age of cheap fuel is over: IEA](#), 28.4.16. See also Newby, J, 'Oil Crunch', *Catalyst*, 28.4.11.

CONCLUSIONS

Along with the Commonwealth and other States, the Queensland Government is being squeezed by business and commentators both to increase its spending on public infrastructure (in order to improve productivity) and to reduce its spending (in order to minimise budget deficits). As governments attempt to navigate between these two contradictory pressures, the appeal of grand transport projects is very strong. These projects generate countable cranes on the horizon and create countable numbers of construction jobs. They have powerful and vocal advocates within the business sector.

However, budgetary provision for glamorous construction projects comes at the expense of every other service that governments deliver: there is an opportunity cost for every budgetary allocation. Unfortunately the benefits of the public goods that governments fund such as scientific research, education and land repair are diffused through the economy and are difficult to quantify. Further, advocates for public expenditure on public goods are commonly employed within the public sector and are therefore unable to publicly pressure the government on behalf of these services.

In terms of economic value created, grand transport projects perform very poorly. Typically, benefit-cost ratios hover around 1.5 or less, in sharp contrast with the value created by investment in scientific research, education or environmental repair (ratios of 10 or more are commonly demonstrable, in addition to wider diffuse benefits). Worse, transport projects, especially roads, entrench Australia's dependence upon imports of petroleum fuel and its intensity of carbon emissions. Modern large-scale road projects, unlike the basic road network, are a form of terminal consumption, not productive infrastructure. The roots of economic activity now lie in protecting the green infrastructure – ensuring that the environment can deliver raw materials and ecosystem services; and nourishing the human infrastructure – the knowledge and skills that allow a society to take advantage of economic opportunities.

To enable it to hasten announcement of a program of major projects, governments have brought industry representatives into the heart of their policy-making apparatus; are bypassing long-established strategic city planning in favour of ad hoc project-by-project assessment; and are neglecting the potential of the multi-disciplinary, partisan-independent public service to deliver liveable cities in particular and economic prosperity in general.

In bypassing traditional methods of infrastructure planning via the multi-portfolio public service in favour of privileging access to business, the Queensland and Commonwealth governments are neglecting the public interest in favour of the commercial interest of the advocates of major projects. This is not in the public interest.

APPENDIX 1: THE AUSTRALIAN INFRASTRUCTURE PLAN: A CRITIQUE

The *Australian Infrastructure Plan*⁶⁰ is a shallow document full of platitudes, repetition, and internal inconsistencies, all presented within a narrow economic rationalist approach. There is little evidence that the authors are aware of the large body of non-economics literature available to them. There is no overview of previous metropolitan or national planning or infrastructure initiatives and their shortcomings. There is no explanation of the infrastructure design that caused Australia's capital cities to routinely appear in the top 10 most liveable cities in the world. A thorough understanding of the past is necessary to prepare for the future. The weakness of its conceptual framework is apparent from the fact that it ignores the range of thoughtful public submissions made to the source report: the May 2015 *Australia Infrastructure Audit*.⁶¹

Some examples of muddled and contradictory thinking are outlined below.

Road-user charging

The chapter on funding and road user charging (p.84ff) is couched in terms of fairness – taxpayers are subsidising motorists – and correctly notes that charging for road use could significantly reduce congestion, such as by flattening peaks. User charging is a tried and true method of managing demand downwards and if the instrument were to be designed with that purpose in mind, with the fees remitted to the consolidated revenue, it could have benefits to the community. However, user charging can be a means of providing a cash flow directly to private toll operators or IT firms: surrendering powers of taxation to a private corporation.

There are several hints in the text that this might be an eventual outcome, whether or not expressly intended. The report dismisses fuel excise as the instrument for user charging (p.84) on the grounds that it will decline as a source of revenue as vehicles become more fuel-efficient. Given that Australia is now importing \$12 billion worth of petroleum fuels each year⁶², and that any instrument that reduces fuel consumption has the benefit of reducing fuel vulnerability as well as congestion, this should be the first option considered. Fuel excise would be vanishingly simple to apply as an instrument (simply increase the rate) in contrast with high tech fixes via tolls and transponders. In any case, fuel excise is only a proportion of the cost of petrol and diesel fuel and is partly hidden; direct road user charging would be at least as likely to dampen demand; so this argument is internally contradictory.

Second is the reference on page 85 that all charging revenue be hypothecated to investment in the road network, rather than enter consolidated revenue and then be allocated to various spending priorities which is largely the current regime. Third is the report's parroting of the submission made by urban transport provider Transurban, even to the point of using its three headings *unfair*, *inefficient* and *unsustainable* (p.84) as well as favourably noting Transurban's trial of road pricing options (p.87). Road user charging implemented by private companies and then leveraged through the capital markets into a program of constructing new tollways would lay waste to Australia's cities as we now know them.

On page 136, the report acknowledges that Australia's economy is highly dependent on imports of petroleum but airily dismisses our nation's vulnerability by noting that 'Liquid fuel supplies are managed on a daily basis by the Australian fuel industry'. Pardon? The Australian fuel industry is unable to control the geological availability of petroleum, the geopolitical attitude of Muslim producer states towards Australia's foreign policy, the choke-points in the sea lanes vulnerable to piracy or the level of demand in states like China or India who might take priority for rationed supplies. Infrastructure Australia should at least have plucked some analysis out of the Senate enquiry of 2015, which recommended that the government publish a comprehensive risk assessment of Australia's fuel supply, availability and vulnerability.⁶³

⁶⁰ The [Australian Infrastructure Plan](#), February 2016.

⁶¹ [Australia Infrastructure Audit](#) 2015.

⁶² See ASPO-Australia's submission.

⁶³ Australian Senate, Rural and Regional Affairs and Transport References Committee, [Australia's transport energy resilience and sustainability](#), June 2015.

Muddled definition of productivity

One further example of foggy writing undermines the overall argument of the report, which is approximately that greater investment and more innovative forms of investment in hard infrastructure are required to boost productivity and therefore economic growth. The report can't even give a coherent definition of productivity!

On page 14, in the second paragraph, the report gives a simple but sensible definition: 'the rate at which an economy transforms inputs – including its people and natural resources – into outputs that can be sold to domestic users or exported ...'. Yet on the very next page, it elides into a very different definition of productivity – 'multi-factor productivity, the rate at which the economy turns labour and capital inputs into outputs ...'. Multi-factor productivity, in which natural resources including energy are invisible, is nowadays the mainstream conception⁶⁴ but the report does not notice the difference.

In classical economics, the three inputs to production were considered to be land, labour and capital. When US economist Robert Solow in the late 1950s formulated neoclassical equations to explain economic growth, he ignored land and modelled just capital and labour. These equations were unable to explain observed growth, so in an influential paper he inserted a factor to make the equations fit, although he cautioned that this 'residual' – some 70% or more of observed growth (!) – was an empirical observation without theoretical justification.⁶⁵

A large literature arose ascribing to 'technological innovation' the unexplained gap between observed growth and growth generated by just capital and labour. Innovation came to be regarded as the primary driver of growth. Even on first principles, this sounds unconvincing, as innovation is intangible, not easily expressed quantitatively, unlike capital and labour. The production function is widely modelled in economics as a mathematical recipe, which innovation cannot satisfy. In any case, the residual has been critiqued as tautological⁶⁶ and does not even capture proxies for innovation reliably⁶⁷.

Replicated studies have shown that the size of the Solow residual correlates nicely with observed rates of consumption of energy⁶⁸. This is hardly surprising, as energy is the means of wresting more productivity out of raw materials and labour.

This analytical blind spot in the report is not just a semantic point, given the centrality of energy to any model of the economy that is dependent on transport infrastructure for its growth. Indeed, s.5B of the legislation requires Infrastructure Australia to specify the productivity gains that may be anticipated from each proposal. It could plausibly be argued that this single passage of waffle invalidates the entire report.

⁶⁴ Productivity Commission, [Public Support for Science and Innovation](#). Research Report, Canberra. P.605ff, March 2007

⁶⁵ Solow, R. (1957) 'Technical change and the aggregate production function' *The Review of Economics and Statistics*, Vol. 39, No. 3, 1957, pp.312-320.

⁶⁶ McCombie, J S L, 'The Solow residual, technical change, and aggregate production functions' *Journal of Post Keynesian Economics* Vol. 23, No. 2, Winter 2000/2001, pp.267-297.

⁶⁷ Hartley, J, 'Does the Solow Residual actually measure changes in technology?', *Review of Political Economy* 12(1) 2000, pp.27-44.

⁶⁸ Beaudreau, B.C. 2005. 'Engineering and economic growth', *Structural Change and Economic Dynamics* 16, 2005, pp.211-220.

Dismissal of previous *National Infrastructure Plan*

The Chairman in his introduction to the 2016 plan made the curious claim that:

... we therefore need a long-term focus and a shared strategy. The *Australian Infrastructure Plan* is the first building block of that approach.

It may be the first milestone publication of the new Infrastructure Australia board, but the claim hardly showers praise upon the 2013 plan by Infrastructure Australia or several generations of regional land-use plans, transport plans and infrastructure strategies by a range of agencies.

The text hints at a collective amnesia and lack of corporate memory that elevates the opinions of the current crop of participants and dismisses the insights of every body of thinkers and practitioners who have gone before. Without a knowledge of the collective learnings of previous experts, of which in policy matters the public service has traditionally been the pre-eminent custodian, a society is condemned to follow the wishes of those with contemporary influence.

Not that the 2013 effort by the predecessor body was praiseworthy. Its June 2013 priority list itemised \$76 billion of new costed projects. Of this, about 96% were for roadworks, railways and ports. How narrow was its focus! Although digital infrastructure, water, energy and Indigenous infrastructure featured in its definitions of infrastructure, only about 1% of funding was directed to those categories combined.⁶⁹

‘Pipeline of projects’ logic applies not only to projects

The President of the Queensland Division of Engineers Australia, Chris Warnock, has pointed out that industry requires a predictable pipeline of projects if it is to invest in the people needed to bring them about. Engineers’ accreditation must be refreshed periodically and they cannot simply go and do something else waiting for an upturn. The boom-bust cycle corrodes the capacity of the profession to serve industry and the community.⁷⁰

Recent national under-investment in construction projects means that large numbers of graduates are now without jobs. It takes some 11 years or more to educate and train an experienced engineer, so long-term planning is required to avoid this waste. Effective strategic planning by government should ensure that the construction industry looks forward to a predictable pipeline of projects so that it can maintain its own networks of competent suppliers, sub-contractors, consultants, and tradesmen.

This eminently sensible logic applies not just to the engineers but to the specialists who prepare the way for them inside and outside the public service. Unless planners, designers, scientists and all the other professionals and trades who enable a liveable community to arise from vacant paddocks also enjoy some level of security of tenure and career pathways, our society cannot expect to get prudent leadership in these areas of expertise.

National Infrastructure Priority List⁷¹

Accompanying the *Australian Infrastructure Plan* is a list of (a) ‘priority projects’, assessed and endorsed for implementation, and (b) ‘initiatives’, requiring further business case development but confirmed as addressing a national need.

The introduction to the document indulges in the hyperbole all too familiar with modern government-style publications: that Infrastructure Australia has undertaken ‘robust, independent assessments’, that the list will ‘underpin Australia’s continued prosperity’, that all inclusions have

⁶⁹ For a detailed critique see Edwards G, ‘New body not in public interest’ *Today*, Institute of Public Administration Australia, April-June 2014.

⁷⁰ Chris Warnock, opening address to 2015 forum on Community Infrastructure. The 2016 State Infrastructure Plan was [welcomed by Engineers Australia](#), who responded that the State had listened to them.

⁷¹ Infrastructure Australia. Feb. 2016. [Australian Infrastructure Plan: The Infrastructure Priority List Project and Initiative Summaries](#). Sydney.

been assessed by the Board through a 'transparent Assessment Framework'. A few features of this list are worth noting.

- **Prejudging evaluations**

First, it pre-judges evaluations still in *progress*. Unlike the references in the previous *National Infrastructure Plan*⁷², benefit-cost ratios are not included except for the two 'High Priority Projects' deemed ready for implementation. Of the 91 not-yet-ready High Priority Initiatives and Priority Initiatives, business cases have been submitted for 10 and are still being developed for 38; another 42 are still at the earlier stages of Options Assessment or Initiative Development and one is at Various Stages. So 10 major projects are advanced as priorities for construction but without any confirmation that their business cases have survived critical scrutiny, either internally by Infrastructure Australia or by the public; and 80 lack even a business case. What can the outcome of this process mean except that projects will gain momentum while leap-frogging traditional methods of sieving and refinement.

- **Not transparent enough**

Second, it is not transparent. The summaries presented appear to be selling the benefits of the project, without any contemplation of alternatives. Typical is the following:

The Australian Infrastructure Audit (April 2015)...noted a number of corridors in Sydney's inner west are severely congested now, and that this will get worse in the future... WestConnex Stage 3 complements Stages 1 and 2 (currently being delivered) and is important in realising the benefits of the WestConnex project as a whole. Modelling conducted as part of the Audit indicates that in the absence of improvements in the corridor, the delay cost of the Parramatta Rd (A31) City West Link Corridor Sydney – Ashfield, Gore Hill/Warringah Freeway/SHB/Eastern Distributor, and Airport to CBD corridors would increase from \$141 million in 2011 to \$665 million in 2031.

Such estimates of cost of not proceeding are akin to counts of angels on the head of a pin. They assume endless growth which isn't going to happen.

- **Lack of independence**

Third, it is not independent enough. Proponents' assumptions of endless growth infuse the list. On page 33, we read – in support of a road project that will funnel traffic onto the WestConnex tollroad – that freight moving through Port Botany will expand from two million units in 2011 to seven million in 2031.

Really? Seven percent per annum for twenty years? Despite climate change and a potential carbon tax? The estimated rate of 4.2% per year growth in international air traffic, supplied by the privatised Sydney Airport, also seems unwarranted.

The report indicates that the benefit-cost ratios for the two High Priority Projects (2.4 and 2.5) have been furnished *by the proponent*. If Infrastructure Australia has not independently validated them, its publication is not independent.

- **Significant changes since 2013 are not explained**

Fourth, there have been significant changes since the 2013 document but these are unexplained in the report. This may be a good sign, that the previous shortcomings have been recognised and remedied.

However, the casual reader might expect that if the 2013 list were well grounded, the 2016 list would have a broadly similar table with traceable updates listing project completions or new additions. It must be of concern if a list of infrastructure priority projects of city-shaping permanence changes rapidly. If the previous list has been abandoned, is the current list is also sitting on quicksand? It leads the reader to wonder if the changes are the result of undue political influence? About 36 projects out of 92 in the 2016 plan are for rail possibly reflecting the preferences of Prime Minister, Malcolm Turnbull compared to those of his predecessor.

⁷² pp.100-101.

- **Examples**

It is worth mentioning a couple of cases relevant to the emerging conclusions of this Research Paper.

1 **Oakajee Port, Western Australia**

In 2013 Oakajee Port was deemed to be in the 'Threshold' category (strong strategic and economic merit): estimated to cost \$5.4 billion with a benefit-cost ratio of only 1.2. Oakajee does not appear on the 2016 list. If this is because it is now considered to be primarily of private benefit to the mining industry, it should not have appeared in 2013. If it is because of the slowdown in demand for iron ore, it should not have appeared in 2013 as such a slowdown was entirely predictable. If it is because Infrastructure Australia has realised that a benefit-cost ratio of 1.2 lies so fully within the margin of error that the project might actually be destroying economic value, then that threshold should be publicly acknowledged and applied to all projects.

2 **WestConnex road project, Sydney**

The WestConnex road project in Sydney estimated to cost \$10-13 billion was in 2013 deemed to be at an 'Early Stage' of planning. In 2016 we find that Stages I and II are already under construction⁷³ with large financial contributions from the Commonwealth. Of what use are infrastructure plans if the road-building agenda proceeds apace regardless?

Leighton Holdings (now the CIMIC Group)⁷⁴

In 2012 the construction company Leighton Holdings published a manifesto identifying 12 major projects to improve Australia's lagging productivity.⁷⁵ Their table (at Appendix 3) should be interpreted generically rather than precisely, as current projects are not necessarily exactly comparable with those proposed several years ago. However, a pattern is visible. Of 12 projects proposed, nine are either under construction or have been included in the Infrastructure Priority List.

In some ways Leighton's report has a more coherent logical framework than the Australia Infrastructure Plan itself as it observes, laudably, that a project by project approach is not the most efficient delivery strategy. Leighton puts forward several themes to aid planning, a significant advance on Infrastructure Australia's approach.

The problem is one of transparency. It appears that comparable success rates are not enjoyed by other bodies seeking official support for new infrastructure, especially soft and green forms. For example, research scientists bidding for public money to build the foundations of future knowledge industries could only dream of a success rate of 75 percent. Individual research teams would in most cases be over the moon with the grant of one percent of the size of any one of these big transport projects.

The Australian Research Council has published the success rates of its flagship Discovery Projects program⁷⁶ for projects commencing in 2016. Of 3,584 proposals received, only 17.7 percent were successful. Even 'success' was qualified as, on average, applicants received only 65 percent of the requested allocation. Imagine what a fillip innovation in Australia would receive if 100 percent of the proposals were approved (not an irresponsible move given that proposers run through extensive peer review and collaboration before the application forms are even lodged).

The total cost would be only \$1.9 billion, a fraction of the cost of the fossil-fuel-intensive infrastructure being constructed every year.

⁷³ ['Go ahead for first WestConnex Tunnel'](#) media release, 12.2.16.

⁷⁴ See [CIMIC website](#)

⁷⁵ ['Australia's Top 12 Infrastructure Priorities Position Paper'](#), February 2012. See summary at Appendix 3 at the end of this paper.

⁷⁶ [Australian Research Council Discovery Projects 2016](#)

APPENDIX 2: QUEENSLAND'S STATE INFRASTRUCTURE PLAN: A CRITIQUE

When the *State Infrastructure Plan*⁷⁷ was released on 13 March 2016, Steve Wardill commented in the Brisbane *Sunday Mail*:

Ditching Queensland's annual infrastructure plan was one of the great foibles of the former Newman government. It left the struggling construction sector clueless about what projects were in the pipeline.⁷⁸

The 2016 Queensland *State Infrastructure Plan* is a very different report from the national one. It has two parts:

Part A: Strategy – 'sets a clear vision for the future with a new approach to infrastructure planning and prioritisation that articulates how we will respond to key opportunities and challenges facing Queensland.'

Part B: Program – 'provides certainty through program of investment over the next four years, and outlines future opportunities without specifying solutions, in order to encourage innovation and ideas from industry.'

Infrastructure Strategy

The *Strategy* has the usual wad of verbal and pictorial padding, but by and large it is a thoughtful document which reveals the Queensland Government's multi-layered understanding of the craft of government.

The report demonstrates a more thorough approach than the national plan: by its scan of Queensland's current circumstances and emerging pressures, by linking land use planning with infrastructure construction, by noting the merits of low-cost solutions, and by its unconfined definition of infrastructure,

Queensland's 2016 plan recognises the economic cost of ignoring climate change; notes that private-sector finance operates on commercial terms; spells out the significant roles of various line agencies; anticipates that technology will transform the electricity sector over the next 20 years; and in a single sentence (p.20) presents a more nuanced perspective on fuel security than the national government's treatment.

The report is not without blind spots. It notes that 'Climate change requires significant, immediate and long-term action with smarter infrastructure solutions' (p.20), but it also claims two pages later that 'Unlocking untapped coal reserves in the Galilee Basin will have significant economic benefits' for regional cities, without facing the fact that fossil fuels contribute to climate change, and that the fossil fuel industry is in decline.

While the report correctly records that energy consumption is flatlining, it anticipates growth in many other civic services and utilities without acknowledging that perhaps predictions of endless growth might be as wrong about water, road transport, and airports as they were about electricity. The inherent inconsistencies in 'sustaining growth' are not recognised.

Finally, and most egregiously, the report fails to recognise that entertaining market-led proposals can potentially undermine all of the forward planning and integration with other public policy objectives that the assessment framework aims to achieve.

Infrastructure Program

Part B of the *State Infrastructure Plan* outlines a program of infrastructure projects with a four-year horizon. The program addresses challenges aligned with each of ten 'asset classes':

1. Cross-government

⁷⁷ Queensland [State Infrastructure Plan](#), March 2016.

⁷⁸ Wardill, S, *The Sunday Mail*, 13.3.16.

2. Transport
3. Energy
4. Water
5. Health
6. Education and training
7. Digital
8. Justice and public safety
9. Arts, culture and recreation
10. Social housing

It is described as a rolling program anticipating annual updates following the state budget, a gesture towards predictability that has escaped its Commonwealth equivalent.

Early in the document it seems clear that the government is impressed by big transport projects. Six of the initial priority projects to be funded through a fast-track State Infrastructure Fund are for roads and one is for rail. An amount of \$20 million is allocated for fast-tracking strategic assessments.⁷⁹

Refreshingly, it promises that 'State government business cases will include an assessment of who ultimately pays for and benefits from infrastructure project investments over the long-term'.⁸⁰

The report then provides a table of approved and favoured projects. This makes it possible to identify some weak links in the strategic assessment framework outlined in Part A.

Planning 'time bombs'

There are 26 'Priority Development Areas', identified for 'accelerated development'. Only an insider would know why all these were declared, but some stand out as potential time bombs that make many of the worthy planning statements in Part A appear hypocritical. Some - such as Caloundra South (Stockland) and Yarrabilba (Lendlease) - have been given exemptions from the standard planning procedures at the request of property developers.

For example, highly contentious projects like Toondah Harbour (Walker) would reclaim wetlands and annexe public parkland, and the seabed, into private ownership. If the town planning system is too clumsy to deal expeditiously and transparently with big innovative but non-conforming projects, then it urgently needs to be streamlined.

The rest appear to be a compilation of all departmental capital works programs. This is not, by itself, invalid but it does raise questions about the relevance of the 'Planning and Prioritisation Framework' outlined in Part A. Only a departmental insider would know the extent to which each capital works project has been subjected to prudent forward planning through normal interdepartmental procedures. It is possible that all have been, but the matter appears worthy of further research.

There is almost nothing for green infrastructure apart from small allocations for capital works and maintenance on national parks, the Great Barrier Reef and some waterway restoration in the Rockhampton region. There is no apparent concession to climate change or plateau oil. No feasible path is traceable between the high-minded ideals of sustainability in Part A and the list of business-as-usual projects in Part B.

⁷⁹ If land resource mapping, environmental research and regional planning had not been starved by previous governments, a special allocation would not now be necessary.

⁸⁰ [Queensland Infrastructure Plan](#), p.20.

APPENDIX 3: LEIGHTON'S INFRASTRUCTURE PRIORITIES

Leighton Holdings in February 2012 produced a submission: *Australia's Top 12 Infrastructure Priorities Position Paper* advocating construction of 12 major projects, in column 2. Its success in having this list accepted by Infrastructure Australia as indicated in column 3, is remarkable.

| Project | Leighton Holdings | 2016 |
|----------------|---|--|
| Sydney | M5 East Duplication, \$5.2bn | Part of West Connex Stage 2, under way; |
| Melbourne | East West Link, \$5bn | High Priority Initiative in IPL |
| Sydney | Second airport | High Priority Initiative in IPL |
| Westernport | Port of Hastings, \$15 bn | Does not appear |
| Sydney | F3-M2 missing link, \$4 bn | North Connex, underway |
| Melbourne | Metro stage I, \$4.9 bn | High Priority Initiative in IPL |
| Sydney | North West Rail Link, \$8 billion | Now Sydney Metro Northwest, under construction |
| Perth | Airport and freight access, \$600 m | High Priority Project in IPL as Perth Freight Link |
| Adelaide | Northern Connector, \$1.2 bn | Under way |
| Melbourne | Third airport | Does not appear, but third runway at Tullamarine is a Priority Initiative in IPL |
| Queensland | Bruce Highway duplication | Priority Initiative in IPL |
| Queensland | Townsville to Cloncurry high-voltage transmission line, \$1.5 billion | Does not appear. Proposal by Leighton in abeyance as mining demand eased |

APPENDIX 4: SOME BENEFIT COST RATIOS OF ‘SOFT’ AND ‘GREEN’ INFRASTRUCTURE

To the best of this author’s knowledge, the analyses reported here have all been conducted within the framework of mainstream economics.

| Commissioned by | Subject | benefit-cost ratio | Reference |
|---|---|---|--|
| Australian Centre for International Agricultural Research | International agricultural research centres | 2.7 restrictive assumptions 3.9 relaxed assumptions, both figures conservative | McClintock, Anthea and Garry Griffith. 2010. <i>Benefit–cost meta-analysis of investment in the International Agricultural Research Centres</i> . Canberra: ACIRA |
| W.A. Dept. of Agriculture | Research & extension into soil acidity W.A. | 5.8 over 20 years 8.7 over 30 years | O’Connell, Michael and Chris Gazey. Oct. 2003. <i>Benefit-Cost Analysis of Soil Acidity Research Development and Extension in Western Australia, 1992-93 to 2001-02</i> . State of W.A. |
| Australian Library and Information Association | Health libraries | 9 conservative | 2013. <i>Worth Every Cent and More</i> . Canberra: AILA. Survey by SGS Economics and Planning. |
| Dusseldorp Skills Forum | Year 12 equiv. education | 3.2 @ 5% discount rate 2.3 @ 7% discount rate | Applied Economics P/L Nov. 2002. <i>Realising Australia’s Commitment to Young People: Scope, Benefits, Cost, Evaluation and Implementation</i> . |
| Feral Arts | Small to medium arts companies | 8 | Eltham, Ben. 15 June 2015. ‘Billions at stake as Brandis smashes the arts sector’. <i>Crikey</i> . |
| CSIRO, Forest Research Institute of Malaysia, ACInfrastructure AustraliaR | Hybrid wattle (<i>A. mangium</i> and <i>A. auriculiformis</i>) | 145 | Anon. 2013. ‘Acacia panels’. <i>Australian Woodsmith</i> . Vol. 99: 14. |
| Wyatt Trust | Financial counselling services | 5 plus intangibles | Parvin Mahmoudi, Ann---Louise Hordacre and John Spoehr. 2014. <i>Paying it forward: Cost benefit analysis of The Wyatt Trust funded financial counselling services</i> . Adelaide: Australian Workplace Innovation and Social Research Centre, University of Adelaide. |
| Department of Sustainability and Environment | Pest control | 100 prevention 25 eradication 5-10 reduction 1-5 containment | Port Philip and Westernport Catchment Management Authority. June 2007. <i>What might a true steward of our land and biodiversity do right now?</i> Victoria. |
| Australian Wool Innovation | Collaborative control of wild dogs | 8.6 | BDA Group. Aug. 2012. <i>Benefit Cost Analysis of AWI’s Wild Dog Investment</i> . Melbourne and Canberra. |
| Cotton Research and Development Corporation | Transgenic cotton research Management of on-farm water 4 years of CRDC projects | 87 whole supply chain 201 levy payers 488 federal gov’t funds 22 whole supply chain 131 levy payers 184 federal gov’t funds 12 industry 13 levy payers 30 Australia | BDA Group. Sep. 2007. <i>Cost Benefit Analyses of Research Funded by the Cotton Research and Development Corporation</i> . Melbourne and Canberra. |
| TAFE Directors Aust. | Increased funding for VET | 2.9 deducting forgone earnings by students 8.9 disregarding forgone earnings | Independent Economics. Aug. 2013. <i>Cost-benefit analysis and returns from additional investment in Vocational Education and Training</i> . ACT. |

| | | | |
|--|---|--|---|
| OECD | Tertiary education | 9.2 male (6 return to public + 3.20 private) 6.9 female (4.4 return to public +2.5 private) | Ting, Inga. 28 Sep. 2014. 'OECD figures show public benefits more than individuals from tertiary education'. <i>The Sydney Morning Herald</i> . |
| | Public investment in broadacre agricultural R&D 1952-2007 | IRR to domestic public expenditure 28.4% p.a. | Zhang, Dandan, Chunlai Chen and Yu Sheng. 2015. 'Public investment in agricultural R&D and extension: An analysis of the effect on Australian broad acre farming productivity'. <i>China Agricultural Economic Review</i> . 7(1): 86-101. |
| | Public investment in broadacre agricultural extension 1952-2007 | IRR 47.5% p.a. (Consistent with median rates in the international literature) | |
| CRC for Spatial Information and ANZLIC | Public investment in coordination, capture and management of spatial data | 9 Western Australian Land Information System 2-9 NSW digital mapping database 5.9 Western Australian integration of land and geographic data 5.5 use of land and geographic data within Victorian Government 2.7 naval hydrography, Great Barrier Reef, fuel savings alone | ACIL Tasman. Mar. 2008. <i>The Value of Spatial Information</i> . Canberra. |
| Productivity Commission | Publicly funded research | 12.4 weighted average of 75 case studies Some case studies cited: 716 blowfly control 160 skeleton weed control 136 one-pass sowing 197 vulpia 464 cropping acidic and compacted soils 145 barley selection 88 unweighted average of 14 studies in grains research | Productivity Commission. 2007. <i>Public Support for Science and Innovation, Research Report</i> . Canberra: Productivity Commission. |
| Dept of Natural Resources and Mines | Coordinated land mapping | 45-140, consistent with interstate and international comparisons | Sanders, Richard. 2 June 2005. 'Benefit/Cost of Land Resource Assessment: The Leichhardt Downs (Burdekin) Study'. <i>Resource Planning Guideline E51</i> . Brisbane: Department of Natural Resources & Mines. |
| | Using wetlands on floodplains for flood mitigation compared to dams | 10 | Kusler, J. and L. Larson. 1993. 'Beyond the Ark: A new approach to US floodplain management'. <i>Environment</i> 35(5). Cited in: Regional Landscape Strategy Advisory Committee. April 2002. <i>Economic Benefits of Open Space in South East Queensland</i> . |