



AUSTRALIAN INFRASTRUCTURE AUDIT

SUBMISSION INFORMING THE AUSTRALIAN
INFRASTRUCTURE PLAN

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SUBMISSION

AUSTRALIAN INFRASTRUCTURE AUDIT



Driving Business Success for Consulting Firms in the Built and Natural Environment

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About Consult Australia

Consult Australia is the industry association representing consulting firms operating in the built and natural environment sectors. These services include design, engineering, architecture, technology, survey, legal and management solutions for individual consumers through to major companies in the private and public sector including local, state and federal governments. We represent an industry comprising some 48,000 firms across Australia, ranging from sole practitioners through to some of Australia's top 500 firms with combined revenue exceeding \$40 billion a year.

INTRODUCTION

Consult Australia welcomes the opportunity to comment on the Australian Infrastructure Audit, and to outline the range of issues we believe should be incorporated in the forthcoming Australian Infrastructure Plan (the Plan) in response to the Audit.

We are proud of our contribution to the Audit process thus far, and indeed the Audit document reflects much of what our industry has called for. We do however believe that certain issues included in the Audit warrant further comment to specifically state our support or further elucidation as the Plan is developed.

As a general matter of policy, Consult Australia has always focused on the policy settings around infrastructure policy and decision making, rather than commenting on specific projects. Accordingly, our comments below will focus on broader policy questions rather than specific findings of the Audit, and will reference the ten reform challenges set out in the presentation of the Audit findings to industry stakeholders.

Overview

Consult Australia is of the view that the Infrastructure Audit reaches to the heart of Australia's infrastructure challenge: that a continuation of current practices will fail to achieve the outcomes needed for Australians to enjoy quality of life outcomes, and the economic benefits that our infrastructure helps achieve today. The first challenge, identified by the Audit, is to move the infrastructure debate away from specific projects to addressing a range of important policy issues that underpin decision making around infrastructure including how we pay for infrastructure, how we procure it, and how we can make better decisions around which projects to proceed with.

Many of these challenges are identified in the Audit, with a view to solutions being proposed in the forthcoming Infrastructure Plan.

This submission draws on those comments included in the Audit and elucidates them to include our perspective, while also adding some additional aspects of infrastructure policy that we feel could drive positive outcomes if also included in the forthcoming Infrastructure Plan. These issues raised can be highlighted and grouped as follows:

1. Improved planning – scenario planning, cities policy and indicators
2. Better governance – the importance of independent agencies such as IA, intergovernmental issues
3. Better decisions – more resources devoted to the front end of the project, factors to consider around project specifications
4. Delivering More for Less through procurement reform – including project briefs, addressing risk, the cost of bidding and lessons learned processes, as well as the underlying cultural challenges in government
5. Stakeholder relationships – community engagement and packaging of works
6. Funding and finance mechanisms
7. Future challenges – Climate change adaptation and resilience, as well as Building Information Modelling

Many of these issues are included in the Audit, while others are not. However, each of these are issues we feel will pose policy challenges in the future, and Infrastructure Australia must address as part of any comprehensive infrastructure policy for the future.

1. IMPROVED PLANNING

Scenario planning

A recurrent theme throughout this submission will be that greater resources need to be devoted to the planning phase of infrastructure development. An important element of the planning process is, as the Audit points out, planning not just for current needs, but future needs, which in turn means forecasting a range of possible future requirements – in other words, “scenario planning”. As this submission will argue, planning decisions need to be based on independent assessments of the available evidence, and with regard to longer term considerations. We endorse the Audit’s suggestion that planning be based upon future population scenarios, rather than simply assessing current needs and shortfalls. This requirement however presents the challenge to better understand what future scenarios will look like, and how we can best measure future infrastructure needs.

A major challenge for planners is to work towards managing population growth, particularly in our major urban centres, rather than mitigating against growth. Forward planning, through corridor preservation and other similar actions focused on the future will be significantly more effective than responding to community needs after they have already occurred.

Reform Challenges addressed: *Population*

Cities policy and indicators

More than 80 per cent of Australia’s population lives in cities that collectively generate more than 80 per cent of our economic wealth. Many of our future infrastructure challenges are unique to cities, as the places with the greatest concentration of population, and where quality of life issues caused by inadequate infrastructure will be most acutely felt in the future.

Some specific issues faced by urban populations include:

- the social and economic costs of congestion;
- the “liveability” of our cities;
- the challenges created by outward urban growth;
- unaffordable housing; and
- inadequate urban infrastructure.

While these issues fall within the wider framework of infrastructure and planning decisions, having a designated cities policy should be an important element of the policy response to the wider infrastructure challenge. By planning and delivering better cities, we can improve the quality of life for those Australians who live there.¹

In particular, we believe the Major Cities Unit, formerly located within the Department of Infrastructure, should be re-established and better resourced to undertake its important work. That Unit could also operate within Infrastructure Australia, but its role in supporting optimal decision making around urban infrastructure is vital.

Another practical benefit of cities policy is the range of indicators used to measure the effectiveness of infrastructure relative to the population that it serves. Measuring and reporting success, not as a score-card but to track progress, will incentivise long-term evidence-based policy development. A range of appropriate measures of the various aspects of quality of life is a useful and important tool to see whether infrastructure is meeting its ultimate aim, and to inform decisions about future projects and policies. An example of success indicators developed by the Australian Sustainable Built Environment Council is included at Appendix A.

¹ See also: [Investing in Cities: Prioritising a Cities and Urban Policy Framework for productivity, prosperity and a better standard of living](#). July 2015. Australian Sustainable Built Environment Council.

Reform Challenges addressed: *Population*

2. BETTER GOVERNANCE

An independent, expert & transparent approach

A robust, independent and transparent process and governance model for the evaluation, prioritisation and decision-making around infrastructure delivery is essential for every tier of government.

Across Australia there are a number of models now implemented supporting greater independence in the selection and prioritisation of infrastructure projects. Infrastructure Australia and Infrastructure NSW are just some of the approaches now employed, while Infrastructure Victoria is in the process of being established. However, the independent and transparent nature of these organisations is essential to their success. Consult Australia is concerned that the creation of Building Queensland may not achieve its intended aims, as the minister has the ability to give directions as to priority projects, and their decision making process is not fully transparent.

A long-term approach to the prioritisation of infrastructure is essential. While many infrastructure projects are prioritised through clear and rational assessment, in some cases decision making risks being misconstrued, and may appear to be driven by political exigency where no clear process or guidelines for assessment have been developed. When communities are competing for scarce dollars, clear processes are essential to assess, rank and prioritise projects. Decisions must be robust and stand the test of changing political and economic circumstances.

At a state, territory and federal level Consult Australia advocates the establishment and/or preservation of independent statutory authorities to provide expert and transparent advice to governments and industry supporting an interagency focus on transport, water, energy and communications infrastructure.

These agencies and their interaction should facilitate a more informed debate across industry and the community about government priorities, supported by strong evidence, research and public advice to government published independently. Delivering an integrated strategic approach to infrastructure planning and prioritisation, they will facilitate better urban and regional development through support for a long-term pipeline of coordinated infrastructure projects supporting productivity and jobs growth.

As the Audit correctly identifies, some tough decisions need to be made if we are to maintain the standard of our infrastructure, and in turn our quality of life. This will likely involve discussions around user charging and a range of other potentially controversial policy settings that represent a new way of doing things. The political risk of changing such long standing policy settings is large, and indeed the challenge presented by the Audit is that if the right response is to be realised, then decisions need to be made that could be vulnerable to short term political considerations and scare campaigns by opportunistic parties. Accordingly, the independent approach to decision making should not just extend to pipelines of work, but also to the policy settings around infrastructure funding and broader infrastructure related issues.

Considering the UK Armitt Report

The UK Independent Armitt Review² of Infrastructure provides many findings and recommendations with relevance for the Australian experience of infrastructure planning and decision making. The objectives of the review were to look at new institutional structures and how political consensus can be forged to support infrastructure decision-making.

² www.armittreview.org

The key recommendations from the Review, for a 10 Year National Infrastructure Assessment supported by an Independent Commission and developed with extensive industry and community consultation, see the Assessment provided to the Chancellor who is then obliged to table it in Parliament within six months, with any amendments, for a vote by the Parliament.

Once the Commission's recommendations have been approved by Parliament, then individual Government Departments would have a statutory duty to produce Sector Infrastructure Plans to support the National Infrastructure Assessment.

This approach goes further than those current models advanced in Australia and provides scope for more informed parliamentary debate, accountability and bipartisan support across electoral cycles.

Successive governments must serve to strengthen the independence and authority of these agencies. Any moves that compromise their independence or advice will be to the detriment of the community and industry where certainty in a long-term pipeline, across electoral cycles, is critical to strategic planning and investment decisions.

Broader, Stronger Cost Benefit Analysis

Critical in assessing the merits of public investment in infrastructure is the application of broad cost-benefit analysis. Increasingly infrastructure projects are assessed individually, over relatively short time-frames and viewed as 'ready to proceed' only where utilisation is close to capacity. The benefits of a longer-term view of infrastructure investment, and governments' vital role in facilitating those longer-term benefits as part of a vision for our cities and regions, needs to be re-established.

Governments need to consider less easily quantified benefits that come with some forms of infrastructure investment. The transformation achieved in Bilbao through the construction of the Guggenheim Museum is often quoted and in some cases poorly emulated. Similarly, the Sydney Opera House demanded unforeseen investment by the governments of the time. But there is no doubt that this is a similarly 'transformational investment' that has been recouped both economically and culturally in the decades that have followed—though this would not likely have been reflected in any cost-benefit analysis.

The criteria governing cost benefit analysis are generally not well understood by the public and are also subject to change and influence. Good governance is critical to resolving this issue, as outlined above. Equally, as already noted, where appropriate, cost benefit analysis should be conducted across multiple projects, and have regard to wider economic benefits that come through agglomeration, jobs growth, and the delivery of more sustainable and liveable communities. It is this approach that has been successfully applied overseas, for example in London through the delivery of the Crossrail project, and which has resulted in significant new private sector investment.

Reform Challenges addressed: Governance

Intergovernmental Issues: Roles and Responsibilities

For infrastructure delivery to occur as effectively and efficiently as possible, without being mired in "buck passing", it is essential that the roles and responsibilities of each tier of government are clearly set out, together with the role of the private sector.

As has been acknowledged through successive inquiries into the nature of Australia's federation, there is a disconnect between the different tiers of government, that is only encouraged when one tier is responsible for delivering and maintaining infrastructure, while another is required to pay the bill. The nature of decision making between these tiers only further muddies the waters.

Some suggested roles might include:

Federal Government

The Australian Government is uniquely positioned to provide national leadership, intergovernmental coordination and support best practice and evidence based research, benchmarking and policy development, through Infrastructure Australia and other agencies. For example, Consult Australia has long argued for the establishment of a Procurement Centre for Excellence, and this function would best perform its objective from within a Commonwealth agency.

The national Government also is uniquely positioned to leverage its balance sheet and use tied grants to deliver specific objectives in relation to infrastructure delivery, land-use and urban planning.

Alongside this the Australian Government has an important role in determining nationally significant environmental and heritage concerns relating to land-use and planning.

State and Territory Governments

The state and territory governments have primary responsibility for service and project delivery, as well as land-use planning. Their role also includes aspects of development assessment, environmental and heritage protection, infrastructure planning and delivery and housing. State and Territory governments establish and oversee relevant planning authorities, and local government administration of each jurisdiction's planning system.

The challenge of the Commonwealth having the means to fund projects while the states and territories deliver them also represents an opportunity for positive reform. Many of the policy settings around infrastructure, such as road user charging, rely on a harmonised approach from the states. However, such outcomes are difficult to achieve at the best of times, and often the Commonwealth has limited scope to push for harmonisation. The example of the Commonwealth with-holding specific purpose payments to states delaying the implementation of important reforms, or in some cases circumventing state based regulation (such as with heavy vehicle regulation) is an important avenue to push the states to implement important reforms. Otherwise, the nature of our federation and political considerations mean that important reforms may simply not be realised.

Local Government

Local Government retains the major responsibility for detailed land-use planning and community engagement around specific developments, while interacting with state and territory governments. This gives them an important role to play with regard to demonstrating the positive impact that specific projects can bring to the amenity of particular communities, to ensure that projects are built to appropriate standards and designs, and to undertake business case development for projects.

Any discussion of local government must, however, address the challenges posed by local government, including their rationalisation. More often than not, local government is a major source of red tape in the approvals process, owing in part to their not having the same resources or expertise as the state and federal governments. Conversely, smaller councils are also in less of a position to undertake projects on behalf of their constituencies, owing to smaller capital works budgets.

Accordingly, Consult Australia is strongly of the view that larger and better resourced councils are better able to plan and deliver the infrastructure that the community needs. We do however acknowledge the need for smaller councils in rural and regional areas, where citizens might otherwise be more removed from centres of decision making. The example of fewer and larger councils in Brisbane and the Gold Coast has already brought their communities the benefits of a local government meeting their community's needs. Indeed, these examples demonstrate the benefits that the community would enjoy from larger and better resourced councils in other parts of the country.

Industry

There is a critical role for industry, which possesses its own unique expertise to offer in regard to projects, policy settings, and decision making processes around infrastructure generally. This expertise can be delivered through individual businesses alongside their industry and professional associations to support best practice and continuous improvement across the wide range of roles in infrastructure development.

Reform Challenges addressed: *Governance*

3. BETTER DECISIONS

Laying the foundations: Investing more in the front end of infrastructure

One argument common to a wide range of reports concerning the better delivery of infrastructure is that a greater share of resources need to be allocated to the front end of the project, leading to better decisions, better relationships between the stakeholders, and better designs for the project, which in turn may reduce the overall cost of the project as well as drive more successful project outcomes. It is a view that Consult Australia strongly supports, and one that we feel warrants further exploration.

The notion of greater investment in the early stages of project development begins in the planning and decision phase. It is essential that resources are devoted to developing a pipeline of projects to take place over future years, based on feasibility studies and the needs of the population. Investment at this stage ensure projects are 'investment-ready', a critical step to attract finance and a necessary step before a project can be declared 'shovel-ready'. This type of forward-planning ensures that the right projects are built at the right time, and offer the returns to the taxpayer that are expected – whether through enhanced economic productivity or quality of life improvements. This issue is already dealt with elsewhere in this submission, but is important to note here, as this is an essential element of allocating more resources to the front end of infrastructure development.

Improving the procurement process is another area that would clearly benefit from greater resources in the initial stages of a project. Many projects are released to the market before they have been fully conceived, and in turn the background documentation is inadequate to achieve the optimal outcome. When a client asks for the wrong thing, they will invariably receive non-conforming bids. In other cases, the broader range of "outside the square" possibilities haven't been considered, meaning possible efficiencies are lost. For example, different works on the one site at the same time will save time and money, but are often not considered in putting together the scope of works.

One solution that is often put forward, and is sometimes considered, is the early engagement of consultants, whether through workshops or engaging a consultant to reverse engineer the brief. This allows the full scope of works to be more fully developed, and in turn may lead to greater clarity in the mind of the client. It serves to highlight to clients possible project risks, and what resources are available from industry in terms of personnel. From industry's perspective, it helps clarify exactly what it is that the client wants. In this context, something particularly worth considering is opening projects up to contestability, whereby the consultant can challenge assumptions or indeed what is being asked for as the best solution to a stated challenge.

Reform Challenges addressed: *Productivity, Governance*

Encouraging better decisions through project specifications

This submission has already discussed the question of governance, and the need for transparent, independent advice about key infrastructure decisions. That advice however will only be as good as the terms of reference used to seek the advice. There are aspects of decision making that must be acknowledged and addressed in any policy framework applying to Infrastructure Australia and its state based equivalents, which ultimately relate not just to project selection, but also the specifications for each of those individual projects.

Whole of life considerations

First and foremost amongst these is the issue of whether decisions about projects and infrastructure networks factor in "whole of life" considerations. Budgetary constraints, the opportunity cost of "future proofing" a piece of infrastructure, and the over-arching (and often contradictory) political imperative to build

more projects for less money all may lead to a project being constructed to a lower specification than would otherwise ensure its “future proofing”. The fact of a project’s construction clearly takes precedence in political debate over the specifications of that project, which may ultimately be more important in determining its success.

For example, the M5 East tunnel in Sydney was built between 1998 and 2001 as a two lane tunnel, with the option for ventilation shafts refused, as that was the cheapest option at the time. However, less than 20 years later, the tunnel has reached capacity, and projects to duplicate it are being considered while the ventilation is being upgraded. The combined costs of both projects will be significantly more than if the tunnel had been built to a greater capacity in the first place. By way of contrast, when the Sydney Harbour Bridge was opened in 1932, it had the capacity to allow every car in NSW to drive it, and took many years to approach its capacity.

This example illustrates how decisions are often made based on the funds available rather than the requirement over the whole of the project’s life. For the reasons cited above, sometimes a decision will be made to undertake multiple projects to reduced specifications, to ensure that different communities are being served, while in other instances the larger specification required for a project means that project costs may pass the point at which their construction is no longer a desirable decision for government.

These competing considerations represent a significant challenge for government in their attempts to stretch infrastructure spending further, by constructing more projects and to greater specifications. However, when government makes the decision to undertake a project, it is important that they at least consider how that infrastructure will be used in the future, and what the costs of future upgrades might be. In particular, the specifications of a project, with reference to current and future use, should be an important part of the decision making process.

Innovation and Gold Plating

It is said in some quarters of our industry that one person’s innovative solution to an infrastructure challenge is another’s gold plated asset. While innovation may deliver a better performing solution or a cheaper solution to the same issue, “gold plating” refers to infrastructure designed to greater specification than is necessary.

However, the charge of gold plating our infrastructure is more complicated than its proponents might suggest. Designing a project to a specification that allows for “future proofing” may in some circumstances be regarded as gold plating an asset, and in other situations as a prudent move to save money over the whole life of that item of infrastructure. In other cases still, projects are designed to a specification that meets peak capacity (for example, in debate about electricity generation) rather than a lower specification that would be acceptable for a majority of the time. These aspects of project decisions need to be considered, and indeed need to be a part of the public debate around infrastructure policy.

Innovation is also an important aspect of this debate. In announcing a project, ministers often talk about innovation being involved in the final design, but the officials responsible for delivering that project are more likely to be concerned with overcoming risk related issues, reflecting a disconnect between the political decision makers and those on the ground delivering the project. This suggests that the whole concept of gold plating may be problematic. Without question, when external funding is being used to pay for a project, a moral hazard exists whereby there are a series of perverse incentives for proponents to over-specify the project’s scope. However, agencies with an engineering background may be conservative regarding any innovative solutions, and discount the greater benefits realized from more expensive options. Conversely, it needs to be recognised that the treatment of risk in procurement processes, including especially contracts and delivery models, will be a major driver for a consultant to develop an innovative solution to a brief.

These issues need to be considered as part of Infrastructure Australia’s advice to government. It will allow for a decision to be made as to whether the additional value of an innovative solution, or a future proofed

project design, is worth the additional cost, and if so, ensuring that the procurement process used encourages such a solution.

Infrastructure Australia should also be able to provide advice as to whether innovation or future proofing is appropriate for the project at hand, taking into account the opportunity cost of spending those additional resources on a particular project, and whether it would be more desirable to potentially be required to spend a greater sum of money on rectification or expansion down the track.

This advice in both instances will lead to better decision making, and will draw out the public's view on the proper specification for projects, with regard to future proofing, innovation and the risk of gold plating.

Cost Vs. value

Consult Australia has long argued the importance of prioritising value over cost as the major factor in determining which bidder wins work on a project. Achieving value incorporates both cost and non-cost element, such as the quality of the work and many of the considerations detailed in this section, such as whole of life factors and innovation.

A number of governments around Australia have already formally committed to value taking precedence over cost in their decision making. However, there are a small number of challenges that must be overcome to ensure this principle is consistently applied.

The first is that in some instances, only the cost of construction is considered, while operational or maintenance costs are ignored. These costs have the potential to shift the balance of a project's value.

The second challenge is that cheaper bids may have failed to take into account particular project risks. Where this is the case, it is likely that costly variations will arise. The lesson learned from these situations is that a client deciding on which tender to proceed with should be able to recognise those bids that have not fully taken into account all project factors. This issue is an extension of the same issue that applies where "whole of life" factors are not properly considered.

Finally, and perhaps the most fundamental challenge, are those situations where understanding the technical merit of a particular tender is not particularly straightforward. Assessing the merits of a design solution may not be easy in these cases, as comparisons are fraught. However, comparing the cost between different bids is easier as comparisons are using the same metric. In these cases, there is a strong temptation for project officers to prioritise cost over value, simply for the reason that it's the easier aspect of a project to assess.

Deadlines and budgets

Finishing a project "on time and on budget" is often considered the benchmark for success by politicians and the taxpaying public. These imperatives, while important, also however risk serving as drivers for those undertaking a project to construct it to a lesser specification than desired or included as part of a priority list simply so they can meet these indicators to claim success. It is important that the planning work done on projects is sufficient to deter this behaviour, and that constructing an item of infrastructure to the appropriate specification remains to the main indicator of project success.

Reform Challenges addressed: *Productivity, Governance, Best Practice*

4. DELIVERING MORE FOR LESS: PROCUREMENT REFORM

Economic benefits of better procurement

A recent study, commissioned by Consult Australia and undertaken by Deloitte Access Economics (DAE), found that public sector agencies could save 5.4% on the cost of professional services through better procurement. It is likely that the overall figure is even larger, as inefficiencies are then transferred through the construction phase of projects.

The study highlights a range of issues in procurement where there is scope for better practices, leading to improved outcomes for all parties. These issues include the following:

Quality of project brief and scoping

The quality of project documentation was highlighted in the DAE report as a major driver of higher costs. The two main aspects of project documentation that are problematic are either the lack of clarity with regard to project objectives, or the failure of clients to verify background information. The report found both of these issues drove up prices, and indeed could be better addressed through a greater investment of effort at the front end of a project.

This aspect of our report is consistent with previous studies, such as the *Scope for Improvement* series of reports³, which found that the quality of documentation was inadequate and a major pressure point in the Australian construction industry.

Risk

The other main issue addressed in our report is that of project risk, including its allocation through the contract terms and conditions or through the selection of project delivery model. While this submission will deal with the issue of risk in greater detail in the next section, it is important that clients understand the impact of certain risk transfer and contractual issues on the project. Furthermore, often risk is inadequately addressed due to cultural issues within an agency, including that a particular approach is how things might have always been done previously, with new approaches to the benefit of the client resisted within that organisation. The treatment of risk by public sector clients is a major area where improvement is needed, and has the ability to yield significant benefits to all stakeholders.

Cost of tendering

The DAE report found that the cost of bidding by consultants is between 0.6% and 2.9% of project value, while previous reports have found this to be as high as 5% (although including other industries within the construction sector in their work). In general, our industry recognises that this is the cost of doing business. We do however ask in return that clients recognise this cost, and not ask firms to bid for work when they do not have a realistic prospect of winning the work, or needlessly keep them alive in a bid process. Indeed, our industry would overwhelmingly prefer to be told “no” early than at a later stage.

Reform Challenges addressed: *Productivity, Competition*

Dealing with Risk

One particular aspect of procurement that was touched upon in the previous section, but merits further discussion is the challenge of better addressing project risk. Improper risk allocation is a major driver of increased costs and less desirable project outcomes in the provision of public infrastructure. It is common

³ http://www.ashurst.com/expertise-detail.aspx?id_Content=6580&pageNo=1

practice for public sector agencies to offer contracts where all risk is transferred to other parties irrespective of who is best able to manage that risk. Because these contracts are offered on a “take it or leave it” basis, there is seldom opportunity for service providers to negotiate appropriate risk allocation. While at face value that might seem a prudent move on behalf of taxpayers, it actually leads to greater risk and increases the cost of work for a number of reasons:

Potentially invalidates insurance cover

The recovery of losses suffered by a claimant is best achieved when there is a valid professional indemnity (PI) insurance policy in place to enable the payment of damages. PI insurance providers will not cover a consultant where their liability under the contract goes beyond their common law liability, including the contractual taking of responsibility for another party’s risks. Should the client wish to recover monies from the consultant for any damages, the consultant will need to directly cover the damages without the use of insurance. Given that the consulting industry in the built environment sector is generally asset-poor, this might mean drawing on the personal assets of business owners. In some situations where the consultant does not have cover, they could go bankrupt and the client has no recourse to recover monies owed. In this situation both parties are considerably worse off.

Consult Australia’s experience is that a significantly large proportion of public sector agencies are not aware of the insurance implications of these risk transfer practices, while in other cases, external legal advisers without a stake in the project’s success will work to shield their client from any liability without reference to commercial or insurance outcomes.

Risk transfer drives higher prices

Professionals tendering for work where there is increased risk placed on them will generally factor that risk into their bid price. In other situations, firms will take the decision that they don’t have the requisite risk appetite to work on a particular project with regard to the contractual risk allocation, and in turn will decide not to bid for work. The reduction in competitive tension at the bid phase ultimately will also increase the price of the services being procured. Accordingly, the transfer of risk is illusory and actually results in the client paying more for the project. The Deloitte Access Economics report, commissioned by Consult Australia, *The Economic Benefits of Better Procurement*⁴ explores this issue in greater depth, and found that public sector agencies pay a premium price of 5.4%.

Reduced incentive for parties to work together to address risk

Contractual allocation of risk to other parties may lead to a client believing that they have properly addressed project risk by allocating it to others. The experience of a number of our members working under contracts where the entire risk was placed on one party was that the other party was easily able to “pass the buck” when they could have managed a risk. When risks were properly evaluated, allocated between the parties and better managed, a more collaborative approach was taken as each party had an interest in seeing the risks properly dealt with. This in turn led to better project outcomes, including better and more efficient delivery of the deliverables, including reduced cost, time and disputation.

Each of these symptoms of onerous risk allocation are significant steps away from realising optimal project outcomes, and best practice procurement. Government agencies must learn to address risk better, and in turn, better outcomes await. However, to do so clearly requires greater investment in the skills training of procurement officers and overcoming cultural challenges within the public service.

Risk transfer deters innovation

By transferring risk to other parties, innovation may be deterred. Indeed, solutions to design challenges are often over-engineered, as consultants seek to take additional action beyond normal risk management to ensure a risk they’re not insured for doesn’t eventuate. This outcome refers not to assets built to proper

⁴ Deloitte Access Economics (2015), [The Economic Benefits of Better Procurement](#).

specifications, but to specifications significantly over and above what's needed to meet their ultimate purpose.

Reform Challenges addressed: *Best Practice, Productivity, Competition*

Cultural challenges in government

In the course of studying procurement policy and practice, our attention has been turned to the underlying drivers of less desirable practices from within the public service. In doing so, significant systemic and cultural factors have come to light as the underlying challenges to overcome.

A major finding was that there is within the public service a culture that rewards officers for not making mistakes rather than for doing things well. The public service is highly risk averse, meaning that if something is perceived to have always worked well in the past, then it should continue to be done the same way in the future. However, that perception of success isn't always accurate (for example, there's little awareness that an alternative approach might be cheaper if it has never been attempted), and this approach ignores the possibility that things could be done better in the future.

In our experience, ministers and the leadership of agencies have provided us with positive responses to our proposals for procurement reform, but that response is seldom reflected amongst the individual officers responsible for specific projects.

Coupled with the cultural challenge is that posed by the political and media system that governs the public service. Public discourse tends to focus on apportioning blame for mistakes made, with "gotcha" journalism a central focus. This means that the media are less interested in discussing success, and more interested in targeting public service failure, whether real or perceived. This in turn means that government's focus is spent more on responding to problems rather than innovating, and it also means that agency officials will act to protect themselves against any charge of leaving taxpayers exposed to risk.

The problem with these cultural and systemic factors is that they drive inertia, and reduce any incentive for agencies to look at doing things better. Ultimately, they mean that public sector procurement and risk management are less than optimal, which in turn drive up the cost of public sector infrastructure projects.

There are however some solutions that Consult Australia proposes:

Firstly, by making agency heads accountable for the procurement outcomes of their agency, government could create a significant incentive to provide a level of political cover for the individual contract managers to innovate in their procurement practices. It would also ensure that the leadership of agencies buy in to vital procurement decisions being made.

Secondly, government should commit to being a "model client", in line with its existing commitment to be a model litigant when engaged in actions before the courts. While largely symbolic, this move could assist in changing the public sector culture, and ensure that the platitudes currently issued are actually followed through on.

Thirdly, public sector agencies should be encouraged to explain to their service providers why particular practices are followed, or terms included in a contract. This forces the agency to consider whether certain practices are actually necessary for the project at hand, given that they will likely be paying a premium price for those practices or contract terms. It also increased the level of empathy between the parties as service providers gain in insight for what the agency is trying to achieve.

Reform Challenges addressed: *Best Practice, Productivity (and we submit that public sector culture is a reform challenge in its own right)*

Lessons learned

As the Infrastructure Audit makes clear, the opportunity to evaluate a project's success and learn from any mistakes is an important step in improving the standard of infrastructure development in Australia. Our industry relishes the opportunity to participate in "lessons learned" workshops. However, these workshops, are not always held, or might not be as beneficial as they could be.

In our experience, a major reason that public sector agencies are often reluctant to participate in lessons learned workshops, is that a "what went wrong" document is created that admits mistakes, and is then made public through Freedom of Information laws. We acknowledge that the creation of such a document could be embarrassing to the political and public service levels of government, and could be misconstrued in the media to suggest a project was a failure, when in actual fact the documentation was only created to strive for even better outcomes in the future.

Our experience has also found that when such workshops do occur, they only achieve the right outcomes when a "no blame" culture prevails. When reviews do occur, they are often conducted individually, rather than jointly involving all stakeholders

Nevertheless, the ability to review a project and learn the lessons from its mistakes is a vital one, and a part of the process that our industry strongly supports becoming a standard feature of projects. Public sector project officers need to be able to discuss the opportunities for improvement in a frank and fearless manner, and clearly cannot do so when political considerations overshadow their ability to discuss these. This needs to be balanced with vital public scrutiny, to ensure that the taxpayers' money is being well spent. This represents a significant challenge for government, which will likely require creative thinking to resolve.

Reform Challenges addressed: *Productivity, Governance*

5. STAKEHOLDER RELATIONSHIPS

Community engagement

The standard and nature of community engagement around infrastructure projects has the ability to determine the project's success in terms of its acceptance and use by the public. Indeed, 'community engagement' is often identified by policy makers as an important component of good policy and program development and project delivery. However, too often, particularly when it comes to infrastructure, we see this mentioned as an important 'box to tick', but with no real idea of (and sometimes no real interest in) how to meaningfully engage communities and other stakeholders effectively.

Ultimately engagement is the process by which organisations, communities and individuals connect in the development and implementation of decisions that affect them around project development. Engagement is a tool to achieve outcomes, develop understanding, educate and/or agree on issues of concern. The process of seeking community feedback on a project is often challenging and frequently undervalued, but our understanding of how we can undertake better engagement and in turn achieving greater social licence is worthy of more attention.

In a more democratised modern society, it is more critical than ever before that the community consultation process is done right to ensure projects are not unduly delayed. To this end, we recommend that Infrastructure Australia develop and apply guidelines to ensure that best practice community engagement occurs. Consult Australia recently launched our *Guide to Procuring Engagement Services* as the first part of our *Valuing Better Engagement* project, and we recommend this Guide as useful template for IA when developing its own guidelines⁵.

Reform Challenges addressed: *Connectivity*

Packaging of works

The Infrastructure Audit is the latest of many official documents acknowledging the important of developing a pipeline of work, setting out stated priorities for government and allowing industry to plan for the future. Doing so increases the efficiency of infrastructure development, by moving away from the "boom/ bust" cycle.

As much larger projects reach the market, the risk of cyclical inefficiencies occurring is much greater. These projects, and mandated limits on the number of participants, risk constraining funds available for smaller projects, and often limit funds entering the market to a smaller number of successful bidders. Additional challenges for industry arise from the large bid costs required to tender for these projects, and the need to import skills to meet larger project demands.

This can result in a 'win or die trying' culture across firms bidding for work. These firms either win the bid and remain commercial, or fail both in the bid and risk their commercial success. Where there is not an even spread of projects available to industry, firms that are not successful on these mega projects risk being permanently locked out of work in the longer term. When larger projects come to the market again in the future, unsuccessful firms will not have the ability to demonstrate currency, knowledge and relationships—hence their long-term viability is threatened. Industry convergence is a consequence with fewer, larger consulting entities reducing overall competition in the market. This will be to the detriment of future projects of all sizes.

In this context, and with a constrained market for infrastructure investment more broadly, there is a case for governments to carefully consider opportunities to break-up major projects or package works with a view to distributing work more evenly. Governments should be cautious of succumbing to the temptation to deal with

⁵ The Guide can be downloaded from our website: www.consultaustralia.com.au

a single winning party, and should not assume that economies of scale will always be realised through project aggregation. Not all the best ideas reside with a single firm, and a mega project can benefit significantly from the involvement and contributions of multiple consultants.

A considered and case-by-case approach to opportunities to de-aggregate projects may encourage more innovative solutions, timely delivery and increase efficiencies. Packaging major projects can encourage shared learnings across project interfaces, help mitigate risks, and encourage collaboration, diverse perspectives and solutions. Ongoing assessment of local industry participation through the packaging of works, monitoring the use of smaller firms, will support industry breadth. In addition, this approach could help sustain a more competitive industry, better able to respond to projects of all sizes in the longer-term.

In this context, we recommend that Infrastructure Australia consider developing a framework for packaging works, including guidance for when it's appropriate to do so, and the issues that will need to be overcome as part of the process. Ultimately, packaging will not be appropriate in every case, and the move must achieve value for money, whilst simultaneously ensuring greater competition.

Reform Challenges addressed: *Competition*

6. FUNDING AND FINANCING

A key challenge highlighted in the Audit is the need to find new sources of funding for infrastructure, as state and federal budgets are increasingly constrained in their ability to fund projects. While government spending will remain an important part of the mix, user charges and other funding sources need to be considered to ensure that Australians continue to enjoy world class infrastructure. More diverse funding sources will also serve to ensure a smoother pipeline of works, overcoming the boom/bust cycle that has characterised infrastructure investment in years past. In the longer-term this will lower construction costs for future investment when an upswing in demand will require skills lost in the downturn.

An integrated approach to funding & financing

Consult Australia's 2010 Report *Transporting Australia's Future* canvasses a range of infrastructure funding and financing mechanisms emerging around the world that can provide sound and proven revenue streams to support infrastructure delivery.

As was noted in the Infrastructure Audit, though not always well articulated in broader public debate, infrastructure will either be funded through public finance (taxes/debt), or user charges. This might be supported by asset sales, or asset sweating, but ultimately it is the tax-payer that foots the bill in either scenario. Alongside effective funding streams, innovative financing mechanisms should be structured to support infrastructure projects and to deliver more equitable, value-for-money outcomes for governments. Public Private Partnerships, including for example value capture and bond banks, provide new opportunities to leverage greater private sector investment across a range of projects. Consult Australia does not consider any single financing or funding policy will by itself provide a stand-alone solution to the substantial challenge for governments, however all options present opportunities for reform. To that end, some key issues for further consideration are outlined below:

Leveraging government balance sheets to drive productivity

Increasingly challenging for governments of all stripes, where budget bottom-lines have become more politicised, is the identification of projects worthy of public financing. In this context governments must reconsider the extent to which surplus-driven budgets and unquestioning dedication to AAA credit ratings limit opportunities to invest in long-term productivity-enhancing infrastructure, particularly at times when interest rates are low such as at present. The 'fiscal populism' that now characterises governments' approach to debt is at the expense of much-needed infrastructure investment.

Nicholas Gruen of Lateral Economics characterises much of the opposition to government debt as a 'faux economic rationalism': 'Australian governments have embraced the notion that all debt is bad, but most of the time debt is only bad if it's used to fund recurrent expenditure. [...] there is a particular perversity in arbitrarily constraining the borrowing of the entity that enjoys the lowest borrowing cost — the government — especially at a time when our largest cities groan under the weight of a widely recognised infrastructure crisis.'⁶

The connection between decision making supporting infrastructure investment and the willingness for governments to leverage their credit rating should not be underestimated. Ultimately a bi-partisan approach to public infrastructure investment, supported by transparent, independent, expert advice, is essential to support a more sophisticated debate about budget policy. This approach will deepen the public's understanding of the benefits of government debt in funding public infrastructure, and apply a high level of rigour, accountability and transparency to the decision making process.

⁶ Gruen, Nicholas. 23 November 2010. *Paying for Australia's infrastructure deficit*. www.inside.org.au

Overcoming institutional resistance: Value capture

Overcoming institutional resistance to more innovative policy solutions will be critical to delivering new financing mechanisms. It is important to realise that not every tool available to governments will be appropriate for every project. Nonetheless steps should be taken to ensure all options are available so they can be used where appropriate.

In the case of Value Capture, institutional resistance, and/or a lack of awareness of potential benefits may be one of the major barriers to implementation. Consult Australia has identified numerous opportunities and lessons that can be learned from overseas experience in successfully implementing value capture mechanisms. Two editions of our report on value capture, published jointly with SKM (now Jacobs) in October 2013 and AECOM in June 2015, set out success factors and a roadmap for value capture in Australia, establishing important reference points for a whole of government approach.⁷

Recycling capital and supporting hypothecation: Asset sales

Consult Australia has long argued for asset sales to release government funds for new infrastructure investment. Earlier announcements by the Commonwealth Government providing tax incentives supporting assets sales by state governments are a positive step. The creation of Restart NSW from funds hypothecated from the lease of Port Botany and Port Kembla is an important model that can be replicated across jurisdictions. While it was encouraging to see Victorian Labor adopt this model in their Project 10,000 transport infrastructure plan, it was disappointing to see the Queensland Government retreat from asset sales with a consequent erosion in business confidence in the Queensland infrastructure pipeline following their success at the last election. While traditionally treasuries have not been in favour of hypothecation, it is clear that where public assets are concerned this is an important tool through which projects can be delivered with broad public support. The subsequent model for capital recycling through the delivery of the Westconnex projects in NSW continues this principal which should be encouraged as governments access some of the more than \$100 billion sitting on their balance sheets (as identified by Infrastructure Australia in 2012).

Fostering a more informed public debate: Road user charging

A comprehensive debate regarding the full application of road user charging, including the development of a national scheme, is long overdue in Australia. Reliance on traditional fuel excise as the key revenue tool to fund infrastructure is internationally recognised as having limited longevity, with diminishing reserves and increased fuel efficiency curtailing revenues. An infrastructure funding regime based on fuel taxes has no sustainable future.

Confusion in public debate about the difference between funding and financing limits governments' ability to make a persuasive case for a funding framework that supports an efficient equitable approach to user charging.

There is no doubt the implementation of any systemic approach to user charging is a long-term goal, and again one contingent on the hypothecation of revenues to infrastructure projects. But achieving that goal is reliant on governments considering international experience, understanding the barriers to implementation and developing pilot schemes to support community engagement and understanding. The establishment of the Transport Reform Network⁸, in 2012 bringing together over 35 key organisations with a united message, is an important step towards delivering the consensus necessary to support more ambitious policy for new funding and financing approaches.

⁷ Consult Australia & Sinclair Knight Merz, (2013) *Capturing Value* and Consult Australia & AECOM (2015) *Value Capture Roadmap*. See www.consultaustralia.com.au

⁸ www.transportreform.org.au

The recent announcement⁹ by South Australian Premier Jay Weatherill advocating for the establishment of a national heavy-vehicle road-user charging system run by the Commonwealth; replacing state-based registration and federal fuel excise with a charging system based on mass, distance and location is to be commended. The Premier has suggested funds raised would be redirected into better planned and coordinated road infrastructure. Significantly the Premier volunteers for South Australia to trial different elements of the system with the intelligence and data collected to inform the introduction of a national charging scheme. A pilot scheme should be supported and is a natural next step to advance debate in this space.

Creating new markets for private investment

In 2013 Consult Australia, as part of the Urban Coalition¹⁰, released *A New Deal for Urban Australia*¹¹ outlining how a new infrastructure investment asset class could be developed offering lower risk, credit enhanced returns for both institutional and retail investors. *A New Deal* outlines how funds raised would capitalise a special purpose statutory investment vehicle to provide attractive seed finance to qualifying projects. The goal is to develop long-dated investment products that deliver guaranteed total returns more attractive than standard government bond rates: Credit enhancement through a tax rebate of 10 per cent and a capped government guarantee are proposed.

A New Deal represents the type of innovative thinking urgently required to better leverage public and private investment in infrastructure across urban and regional Australia. The delivery in the Federal Budget of the Northern Australia Infrastructure Fund reflects this type of model seeking to attract greater private investment through seed finance. Federal investment in this fund though is still relatively modest relative to the infrastructure task.

More recently, the United Kingdom's City Deals¹² policy initiative has gained some traction in public debate as a new way of approach infrastructure funding across tiers of government. This approach will propose new financing mechanisms delivered through a better understanding of the value and breadth of productivity benefits that flow, not just from individual projects, but from packages of projects and initiatives. This approach better reflects the true value of infrastructure investment supporting jobs and more liveable, productive and sustainable communities.

Reform Challenges addressed: *Funding*

⁹ [Press Club Address](#). 8 July 2015. Hon Jay Weatherill MP, Premier of South Australia.

¹⁰ Comprising: Consult Australia, Association of Building Sustainability Assessors, Australian Conservation Foundation, Australian Institute of Architects, Green Building Council of Australia, National Growth Areas Alliance, Planning Institute of Australia, Property Council of Australia, Urban Development Institute of Australia

¹¹ Urban Coalition, April 2013, *A New Deal for Urban Australia*, www.consultaustralia.com.au

¹² <https://www.gov.uk/government/policies/giving-more-power-back-to-cities-through-city-deals>

7. FUTURE CHALLENGES

Climate Change Adaptation and Resilience

One consequence of climate change is an upsurge in extreme weather events. Australia's high vulnerability to extreme weather events such as bushfires, drought, storms and floods means that the continuing prosperity of the nation is dependent on resilience to these events. With an overall replacement cost for Australia's built environment estimated by Geoscience Australia to be in excess of \$5.4 trillion, the economic, social and environmental risks are significant. Managing risk in the built environment is crucial, as ill-considered decisions leave communities and critical infrastructure vulnerable to extreme weather events of increased incidence and severity.

The approach to adaptation across the country is currently piecemeal, and the focus by government and industry has predominately been focused on mitigation rather than resilience. Apart from the National Strategy for Disaster Resilience there appears to have been a lack of coordination and funding for adaption considerations for the built environment. There is today a strong need for adaptation and resilience to be considered as part of the infrastructure decision making framework.

The first step for all governments must be recognition of the problem, and that adaptation can ultimately save government money.

To this end, we recommend the ASBEC climate change adaptation guide, *Preparing for Change: A Climate Change Adaptation Framework for the Built Environment*¹³. The guide sets out a series of actions targeted at the different tiers of government, focused on better planning and decision making around climate change adaptation.

Reform Challenges addressed: *Sustainability, Resilience*

Building Information Modelling

The adoption of Building Information Modelling (BIM) by government has the potential to change the face of how project designs are developed. While market forces have dictated its use thus far, a significant case is emerging for government to mandate the use of BIM across all projects, which in turn will provide benefits to the local professional services industry. Furthermore, there is also the opportunity for the Commonwealth government to take the lead in developing national guidelines and working with the states and territories to achieve a uniform national position on the use of BIM, including bidding approaches for public infrastructure projects.

What is BIM?

There are a number of definitions of BIM currently used, but in general, BIM is a 3-dimensional digital model of the physical and functional characteristics of a building, serving as a shared resource for information about a building throughout its lifecycle, and supporting decision making – from strategic appraisal through briefing, design and construction to operation, maintenance and renewal.

BIM allows for more efficient methods of designing, creating and maintaining our assets. From a practical perspective, the use of BIM data improves quality and cost effectiveness of design, construction and management of infrastructure assets.

¹³ <http://www.asbec.asn.au/files/ASBEC%20Preparing%20for%20Change%20Report%20FINAL.pdf>

Benefits of BIM

1. Better and cheaper infrastructure for government

Based on the UK experience and the size of the Australian Government's capital works program, potentially \$10 billion in savings could be realised on public sector projects.

2. Improved productivity in construction, and asset management generally

BIM offers the opportunity to realise large reductions in the cost of capital works by eliminating waste from the design, construction and handover activities. Further savings are then available through the asset management phase through better building information allowing for efficiencies to be realised.

Already in countries where BIM is widely used such as the UK, Singapore and South Korea, clients are reducing costs and improving quality of the design, construction and management of their infrastructure assets, while saving on bid costs.

The Australian Building Smart survey found that using BIM could improve the productivity of the industry by 6 to 9 percent.

3. Economic benefit of \$5 billion in additional GDP

The Building Smart Survey found that a modest increase in BIM usage by 6 to 16 percent by 2025 could potentially produce a national economic benefit equivalent to \$5 billion added to Australia's GDP. This is a conservative estimate by industry.

4. Risk reduction

Project risks can be reduced through clear information requirements, defined processes and standards and using design modelling techniques to identify and address interface and constructability issues, including clash detection.

Asset management risks can be reduced by ensuring that relevant information is provided to the required quality and is stored in a structured way.

5. A potential export market for Australian "know how"

Increased adoption of BIM offers the opportunity for Australia to export our design and construction services to the developing world. Countries such as the UK are already starting to globally export their BIM services, and there is an opportunity for Australian industry to build competence and experience in BIM and export that expertise to other countries.

6. Safety Improvement

BIM has been shown to reduce safety risks, and assist industry in meeting their safety in design obligations under existing WHS legislation, including communicating safety information to the supply chain.

7. Sustainability

Improved environmental outcomes are another outcome of using BIM, by ensuring environmental data, such as energy consumption and embedded carbon are used to drive performance improvements once a building is opened for use. The potential exists for offsite construction to deliver assets using half as much waste and 25 percent less energy.

The Case for Action

A number of government agencies around Australia have independently started moving towards using BIM. These include the Department of Defence, Tasmanian Department of Health and Human Services, NSW Health Infrastructure, Transport for NSW, South Australian Department of Planning, Transport and Infrastructure, and the Northern Territory Department of Infrastructure.

However, currently Australia has no mandated policies to drive the effective use of BIM.

Without the coordinated involvement from government, Australia risks getting left behind. Particular risks include:

- **Uniformity**

There presently is the risk of BIM developing in Australia in piecemeal fashion, with multiple agencies and jurisdictions developing the use of BIM in a different way. Through a uniform adoption of BIM, Australia could achieve a greater competitive advantage.

- **Cultural inertia**

Our experience has shown that many procurement officials in Australia will continue to procure infrastructure in line with past practice, rather than being open to new and improved ways of doing things. This means that government involvement is needed to overcome resistance to using BIM and realising its benefits on behalf of the Australian taxpayer.

- **Skills**

At present, insufficient skills exist within the built environment sector to fully utilise BIM. However, if BIM were widely adopted or mandated, there would be great impetus for educational institutions to include those skills as part of their training, and for industry to focus on ongoing training for the use of BIM.

Overseas Experience

A number of countries, including the UK, China, South Korea and Singapore, have mandated the use of BIM, and are enjoying the benefits of BIM being deployed at a rapid rate.

Already in the UK, their BIM strategy has led to a 20 percent capital cost saving on publically procured assets – a return of investment of £840 billion over a three year period.

Prominent examples of projects that realised the benefits of BIM include the £15B Crossrail project in London and the £2.6B Stockholm Bypass project in Sweden.

Reform Challenges addressed: *Best Practice*

CONCLUSION AND NEXT STEPS

Thank you for the opportunity to comment in response to the Infrastructure Audit ahead of the development of the policy response to it. This submission has highlighted a range of issues of concern to Consult Australia and our membership, including suggestions to improve outcomes for the Government as a provider of vital infrastructure.

We value our relationship with Infrastructure Australia, and would welcome any opportunity to participate in further rounds of consultation, including the possibility of discussing this submission in person. Such an opportunity would be used to provide greater in-depth information about the issues raised in this document, and to share our expertise on the provision of infrastructure.

If you would like to further discuss any issue raised in this submission, please contact our National Policy Team: Jonathan Cartledge by email at jonathan@consultaaustralia.com.au; or Robin Schuck by email at robin@consultaaustralia.com.au or phone: 02 8252 6711.

Consult Australia commends Infrastructure Australia for its work on the Audit, and looks forward to working together with Infrastructure Australia to achieve better outcomes for all Australians.

APPENDIX A: A SUCCESS INDICATOR FRAMEWORK FOR CITIES

Measuring and reporting success will incentivise best practice and support long-term evidence-based policy development. The following transparent and consistent indicators be considered for measurement across all our major cities. This list is not exhaustive and further indicators may be identified through further research and analysis.

Leading ‘flagship’ indicators, developed in consultation with stakeholders, should encourage public debate about city performance (in the same way GDP, employment and foreign investment stimulate debate about broader economic performance).

Measure	Theme	Indicator
Economic prosperity	Employment	Employment participation rate Numbers and percentages employed, by industry
	Household income	Weekly household income Net household savings
	Education and training	Proportion of adult population with vocational or higher education qualification
	Economic structure and productivity	Estimated city GDP per capita
		Private new capital expenditure
Contribution to Total Factor Income by industry		
Land use and transport	Land utilisation	Proportion of land allocated to different land use zones
		Average floor area ratio of non-residential buildings constructed in previous 12 months
	Transport mode share	Trip to work modal split, number of journeys
	Freight efficiency	Freight transport modal split, tonne-kilometres
	Accessibility	Proportion of households within 400 metres of public transport access
		Average commute distance
	Congestion	Proportion of households within 400 metres of a retail zone
		Cost of road congestion
Density	Housing density Population density	
Natural resources	Carbon/energy	Greenhouse gas emissions by industry sector
		Residential electricity consumption
		Residential gas consumption
		Percentage of energy derived from renewable sources
		Transport fuel consumption
	Air quality	Exceedences of fine particle (PM10) health standards
	Materials and waste	Solid waste to landfill by source, (municipal, commercial & industrial and construction & demolition) per capita
		Percentage recovery of municipal, C&I and C&D waste
		Material intensity indicator
	Water resources	Potable water consumption by sector
Potable water quality – exceedences of Australian Drinking Water Guidelines Volume of wastewater recycled		
Productive land	Area of land utilised for agricultural production	
Health	Inland water bodies	Exceedence of surface water quality guidelines
	Green infrastructure	Percentage tree cover
		Ratio of pervious to impervious surfaces
		Area of contaminated sites remediated as proportion of urban area Leaf area index
	Habitat quality	Percentage of vegetated land cleared for development
		Landscape stress index Habitat connectivity
	Coastal processes	Proportion of urban wastewater treated to primary, secondary and tertiary levels
		Proportion of coastal zones managed as conservation reserves

Measure	Theme	Indicator
Liveability	Health	Number of hospital beds per 10,000 population
		Number of doctors per 10,000 population
		Male life expectancy at birth
		Female life expectancy at birth
		Residential aged care places per 1000 population
		Proportion of people aged 16–85 diagnosed with a mental disorder in the 12 months prior to the survey
		Proportion of population overweight or obese
		Security
	Homicide rates per 100,000 population	
	Rates of assault and break and enter per 100,000 population	
	Local amenity	Proportion of households within 400 metres of public open space
		Proportion of households within 800 metres of a “town centre”
	Public participation	Participation rate in sport/physical recreation
Number of community gardens per 100,000 population		
Volunteer hours per 100,000 population		
Happiness	Subjective wellbeing index	
Socially inclusive	Cost of living	Consumer Price Index
		Index of Relative Socio-economic Disadvantage
		Analytical Living Cost Indexes
	Housing	Rental vacancy rate
		Homelessness rate
		Proportion of household income spent on mortgage payments
		Proportion of household income spent on rent payments
	Population	House price index
		Non-compliances with Disability Discrimination Act
		Socio-Economic Indexes for Areas (SEIFA)
Governance	Transparency and reporting	Country of origin and language spoken at home
		Publication of annual sustainability report Publication of financial information
	Accountability and responsibility for delivery	Existence of published performance delivery standards Annual consumer satisfaction survey
	Long term vision and goals	Existence of a vision statement
	Participation	Civic associations per 10,000 population
		Holding of public forums
	Corporate governance	Number of organisations with a certified environmental management system

