Australian Government
Infrastructure Australia

Better Infrastructure Decision-Making:

Guidelines for making submissions to Infrastructure Australia's infrastructure planning process, through Infrastructure Australia's Reform and Investment Framework

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Introduction

Infrastructure Australia seeks proposals for reform and investment initiatives which support its seven key priorities, including proposals which should form part of the national strategies currently being developed. Infrastructure Australia expects to receive fully integrated submissions, demonstrating how a range of initiatives fit within one or more overarching infrastructure plans.

Infrastructure Australia is focused on improving infrastructure planning processes across Australia and on identifying reforms to the operation of infrastructure networks, and therefore has a particular appetite for submissions proposing initiatives of this type.

Infrastructure Australia undertook a review of the 2008-2009 submission and prioritisation approach and sought feedback on the process, notably from State and Territory governments. The review and feedback identified two principal issues:

- A series of weaknesses in submissions received, particularly the frequent absence of a structured, robust, top-down planning process to underpin requests for funding and a poor evidence base supporting projects; and
- The need for additional guidance from Infrastructure Australia in articulating its evidence requirements. In particular, more detailed guidance on Infrastructure Australia's own top-down planning process - the reform and investment framework - was requested to help proponents to demonstrate that they have used the required methodology.

This guidance document has been prepared in response to these issues, and provides further direction to assist proponents in preparing well developed submissions that are underpinned by robust planning, evaluation methods and decision-making.

1. Infrastructure Australia's Focus Going Forward

Infrastructure Australia's purpose is to identify reforms and investments which are vital to ensure Australia's economic infrastructure continues to support and drive the nation's economic, social and environmental success.

Infrastructure Australia's December 2008 *Report to the Council of Australian Governments* identified, on the basis of submissions received and Infrastructure Australia's own analysis, seven key themes for action:

1. *A national broadband network*: developing a more extensive, globally competitive broadband system;

2. *Creation of a true national energy market*: more extensive national energy grids to enable greater flexibility and competition in the nation's electricity and gas systems, whilst creating opportunities for the development of renewable energy sources;

3. *Competitive international gateways*: developing more effective ports and associated land transport systems to more efficiently cope with imports and exports;

4. *A national freight network*: development of a National Freight Network so that more freight can be moved by rail and road;

5. *Transforming our cities*: improve the efficiency and sustainability of our cities by increasing public transport capacity in our cities and making better use of existing transport infrastructure;

6. *Providing essential indigenous infrastructure*: improved services for indigenous communities; and

7. *Adaptable and secure water supplies*: more adaptable and resilient water systems to cope with climate change.

Infrastructure Australia believes that improving infrastructure planning practices around Australia is critical in order to take effective action in these areas. The States and Territories have clear responsibility for planning and decision-making within their boundaries. In addition, the Australian Government is taking a more active approach to infrastructure planning.

In this context, Infrastructure Australia has an important role in promoting best practice planning and decision-making; providing a clear national perspective, improving the linkages between jurisdictions, and shifting decisions about infrastructure from traditional project-by-project and jurisdiction-by-jurisdiction approaches to a much broader and deeper focus on national objectives and priorities.

Therefore, Infrastructure Australia's May 2009 *National Infrastructure Priorities* report made two distinct recommendations relevant to those seven themes:

- First, a series of major policy reviews to identify and address the causes of the deficiencies in our nation's infrastructure. These reviews include:
    - A National Ports Strategy and a National Freight Network Strategy, looking at how regulatory and governance reforms would help create an efficient freight transport system to support economic growth;

- A Water Strategy, including the identification of actions to ensure urban water security and a review of water quality in regional towns;
- An Energy Strategy, identifying solutions to improve the effectiveness of the national energy market in securing a sustainable energy future for Australians, particularly through examining issues of interconnection between states and regions and the ability of renewable energy supply sources to be connected to areas of demand; and
- An Infrastructure for Indigenous Communities Framework to ensure that infrastructure supports sustainable development in those communities.

- Second, Infrastructure Australia recommended ten capital investment projects suitable for funding from the Building Australia Fund (BAF). A further series of projects, which were not fully developed but showed real potential to improve national productivity, were identified in a "pipeline" of potential projects.

Through the series of strategies announced in the May 2009 report, Infrastructure Australia continues to work with relevant stakeholders to identify reforms and investments in Australia's infrastructure to improve the quality of economic, social and environmental outcomes that are so critical to Australia's future productivity and growth.

Infrastructure Australia is now seeking proposals of reform and investment initiatives which support the seven themes for action, including proposals which could form part of the national strategies currently being developed. At the present time, Infrastructure Australia seeks to build a long term pipeline of reforms and investments.

In addition, it is important to note that Infrastructure Australia takes a long term, top-down approach to infrastructure planning. Infrastructure Australia is not seeking a list of projects looking for alternative sources of funding, but instead coherent proposals for a long-term package of reforms and investments, which are the direct result of thorough and evidence-based infrastructure planning processes, and which are clearly presented in that context.

Finally, and for the avoidance of doubt, where a proponent can demonstrate a strong case that an initiative is clearly beneficial to national productivity, it is not expected that ongoing strategy work in that area would needed to be completed before Infrastructure Australia can indicate its support for the initiative.

2. Lessons from the 2008-2009 Prioritisation Process

During the 2008-09 infrastructure audit and prioritisation processes, Infrastructure Australia carried out a number of consultation processes that sought evidence-based advice from a wide range of bodies on the future of Australia's infrastructure.

This involved a public submissions process where governments, industry and the community were invited to provide ideas as to how to foster an environment in which infrastructure spending decisions can be optimised towards the delivery of Australia's economic, social and environmental objectives. In addition, in response to earlier decisions by the Council of Australian Governments, State and Territory Governments were asked to make submissions to Infrastructure Australia on the gaps, deficiencies and bottlenecks in infrastructure in their jurisdiction.

Given Infrastructure Australia's national, top-down approach on infrastructure planning, Infrastructure Australia released its Audit Framework (see Table 1) to help guide proponents in the development of their submissions and to frame decision-making. This Framework was established by Infrastructure Australia in response to widely held views that infrastructure decision-making is typically carried out in an environment where initiatives are considered in isolation, lack coordination and where the initiatives themselves are driven by short term considerations.

The Framework adopts a top-down approach, starting with a clear articulation of the overarching policy goals, problems and challenges facing Australia, before policymakers identify and assess various options or solutions to these problems.

However, the evidence provided to support the majority of initiatives submitted to Infrastructure Australia failed to articulate how this Framework was applied in order to develop the proponent's priorities. In particular:

- There was little evidence that the initiatives were the result of robust, top-down infrastructure planning and decision-making processes: indeed there was often no obvious link between individual projects and their context, i.e. prevalent strategies or plans;
- Some initiatives did not support Infrastructure Australia's strategic priorities or make a significant impact on national productivity;
- There was little attempt to define or quantify the problem that the initiative would solve, so that the case for action was not clear. As a result, it was often not clear why the initiatives submitted to Infrastructure Australia had been prioritised above other potential candidates;
- A broad range of options to solve the problems was not considered – in particular many submissions jumped directly to large-scale, expensive capacity enhancements, without any consideration of 'non-build' solutions such as changes in regulations, governance arrangements or introducing demand management measures to make better use of existing infrastructure; and
- Many initiatives, including those seeking immediate funding, were presented with limited or no supporting economic analysis, with flawed analysis, or with analysis which showed that projects were likely to be economically unviable.

Table 1: Infrastructure Australia's Reform and Investment Framework (the Audit Framework)

Stage	Description	Components Required	Rationale
1. Goal Definition	Definition of the fundamental economic, environmental and social goals that Australia seeks to achieve. For example: • sustained economic growth and increased productivity; • lower carbon emissions and pollution; and • greater social amenity and improved quality of life.	• Formalised, comprehensive, and agreed goals, objectives, targets and indicators. • Specific and quantified goals, objectives and targets. • Outline how the initiative fits within existing infrastructure plans. • Outline of how the goals and objectives align with those of other parties (e.g.: National – including Infrastructure Australia's Strategic Priorities, State/Territory, Regional, and Local level) and across sectors.	Goals are needed against which problems and solutions can be assessed.
2. Problem Identification	Objective, specific, evidence-based, and data rich identification of problems of infrastructure systems and networks that may hinder the achievement of those economic, environmental and social goals.	• Situation Assessment - a review and analysis of the current status. • Scenario Assessment – a review and analysis of the future status that identifies: ○ Driver and trends of the current and future situation ○ Base-case using the current trends (certainties) ○ Alternative futures using future trends (uncertainties) • A list of Problem Statements that can be accurately defined and quantified.	Specificity regarding inadequacies is essential in order to take targeted and therefore more effective action.
3.Problem Assessment	Objective and quantified appraisal of the economic, environmental and social costs of those deficiencies, so that the most damaging deficiencies can be identified and prioritised.	• Accurate and objective assessment of the economic /environmental/social impacts of those problems. • Priorities identified which reflect the scale of impacts.	Understanding the costs/impact of deficiencies allows the worst problems to be identified and prioritised.
4. Problem Analysis	Objective policy and economic analysis of why these deficiencies exist – i.e. what is the underlying cause (depending on the sector, reasons could include market failure, government failure, capital restrictions, etc). This should include an assessment of non-infrastructure reasons for the problem – e.g. land use patterns, peak demand; or education/business hours.	• For each deficiency, analysis of why those problems have developed. • Covers both immediate and underlying causes (e.g. not just 'lack of investment', but causes of underinvestment, e.g. regulatory environment).	Understanding the causes allows effective and targeted solutions to be created. Infrastructure is often not the only cause of problems.
5. Option Generation	Development of a full range of interventions that address the issue in the domains of: • reform (regulation, legislation, governance); and • investment.	Identify the full range of Options for each problem from the domains of: • reform - e.g. independent pricing, regulation, approvals, coordination; and • investment - e.g. better use through demand management, capacity increases.	Identification of a broad range of options – across reform and investment areas - rather than relying on early judgements or pre-conceived ideas - is more likely to identify the best Solution or package of Solutions.
6. Option Assessment	Strategic analysis and cost-benefit analysis to assess those options. The appraisal should incorporate the full range of economic, environmental and social impacts (including agglomeration and trade impacts, carbon impacts, noise, and social amenity) so that the impact on all goals is measured and understood.	Qualitative and quantitative analysis including: • Strategic analysis – using high-level profiling assessment – to assist in the analysis of a large number of Options; and • Rapid analysis – using a high-level Appraisal assessment –such as a Rapid Cost-Benefit Analysis (CBA) – to assist in the analysis of a smaller of Options.	An understanding of the strategic and economic value along with the risks and uncertainties in delivery - is essential to understand how the Options or package of Options will achieve the fundamental goals outlined in Stage 1.
7. Solution Prioritisation	Identification of policy and investment priorities from the list of solutions, on an objective basis that gives primacy to the Benefit-Cost Ratio (BCR) of initiatives, but is balanced by considerations such as strategic fit and deliverability (including risk, affordability).	• A structured and objective evaluation framework - that reflects the primacy of Cost Benefit Analysis along side of the strategic value and deliverability risk - is used to make decisions on the long term infrastructure pipeline. • A review of the Solution is made against the fundamental goals/problem identification.	BCRs provide the best available objective evidence as to how well solutions will impact on the goals outlined in Stage 1 – but is not the whole story.

3. Updating the Pipeline: 2009-2010 Submissions

The Infrastructure Australia infrastructure pipeline is a 'living' statement of where Infrastructure Australia believes governments, the community and the private sector can best focus their infrastructure efforts.

Infrastructure Australia is now seeking proposals of reform and investment initiatives which support the seven themes for action, including proposals which should form part of the national strategies currently being developed. Infrastructure Australia welcomes submissions from governments, industry and the community as it updates its National Infrastructure Pipeline.

Given the focus on high quality strategic planning, Infrastructure Australia expects to receive fully integrated submissions, demonstrating how a range of initiatives fit within one or more overarching infrastructure plans.

Infrastructure Australia continues to use the Reform and Investment Framework to guide its own strategic infrastructure policy and planning, and therefore to inform its decision-making in relation to reform and investment priorities. Infrastructure Australia is therefore seeking 2009-2010 submissions for support for reform and investment initiatives which:

- Form part of a set of coherent proposals for a long-term package of reforms and investments, which are the direct result of thorough and evidence-based infrastructure planning processes and the resulting strategies - and which are clearly presented in that context;
- Support Infrastructure Australia's strategic priorities, including proposals which could form part of the national strategies currently being developed by Infrastructure Australia;
- Clearly identifies and quantifies the problem and explains why solving that particular problem is being prioritised against other potential problems;
- Are a sophisticated package of both reform and investment initiatives, with a focus on reform initiatives. All capacity investment initiatives should demonstrate why making more efficient use of the existing network, for example through regulatory or pricing reform, is not a better solution; and
- Are backed by comprehensive and robust demand/price forecasting; capex and opex estimates, and economic cost-benefit analysis.

However, it should be noted that Infrastructure Australia seeks to build a long term pipeline of reforms and investments. Therefore submissions should not be limited only to initiatives seeking immediate support. Infrastructure Australia welcomes submissions which identify potential future priorities without specifying a precise solution: for instance submissions which identify major emerging challenges and a range of potential solutions for further analysis, for ongoing consideration in Australia's infrastructure pipeline.

Information Requirements

Infrastructure Australia is looking to proponents to structure a response along the lines of Infrastructure Australia's Reform and Investment Framework. The Framework should guide the documentation of information, data, analysis, outputs and conclusions in a systematic way.

By responding to all seven stages of the Framework, submissions will be able to demonstrate the rigour that has been applied in planning and investment decisions, which is

a critical and fundamental piece of analysis and assessment to support a request for support from Infrastructure Australia.

Some parties who made submissions in 2008-2009 sought additional guidance to clarify Infrastructure Australia's expectations on the nature of the process, data, analysis and information required for each stage of the Framework.

Therefore, in addition to the consolidation of a range of explanatory and guidance documents previously issued by Infrastructure Australia, this document provides further guidance on the information required for each stage of the Framework.

Infrastructure Australia expects that the information and evidence it requires will generally already be available to proponents, since the stages are central to the robust decision-making process which proponents will have carried out before submitting an initiative to Infrastructure Australia for support. The quality and robustness of this information is vital for all stages of the Framework: comprehensive and high quality information should be provided pro-actively by proponents.

However, Infrastructure Australia relies on the judgement of proponents to assess each initiative's stage of development and the respective level of information available. If relevant information is unavailable or if there are gaps in a proponent's processes, this should be explained.

To provide guidance, the following sections outline in further detail the specific information requirements that Infrastructure Australia seeks from proponents for each of the seven stages.

Infrastructure Australia has also developed detailed "templates" to help proponents compile and present the information in a submission to Infrastructure Australia in a clear and consistent manner. These templates are available at the Infrastructure Australia website.[1]

Transparency

Many of the proposals made to Infrastructure Australia last year were submitted on a confidential basis. Feedback from jurisdictions has indicated some uncertainty as to the treatment of material provided to Infrastructure Australia. In addition, there have been calls for Infrastructure Australia to release more details about the initiatives it has recommended.

In order to ensure maximum transparency while being sensitive to issues of commercial and other confidentiality, proponents are asked to indicate which parts of their submission have been submitted to Infrastructure Australia on a confidential basis and to provide a brief explanation of the reasons for the request for confidentiality. Infrastructure Australia may further discuss such requests with proponents, with a view to maximising the amount of information that can be made public.

[1] www.infrastructureaustralia.gov.au

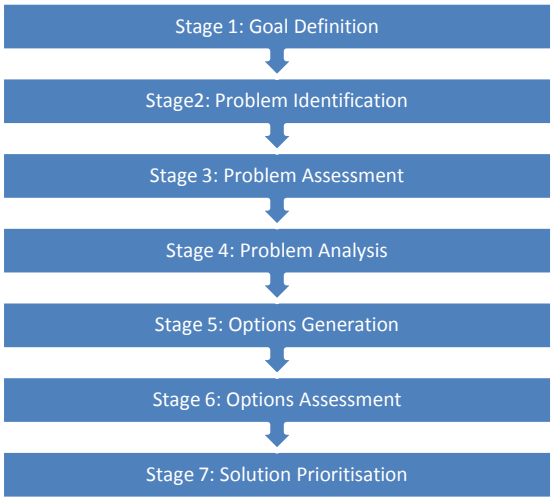
4. The Reform and Investment Framework in Detail

Infrastructure Australia's Reform and Investment Framework ("the Framework") is a top-down approach to infrastructure decision-making with seven distinct stages. The sequential stages are structured to ensure that decisions are taken in an objective and systematic way, thus leading to the adoption of the most effective and efficient policy solutions.

Provided it is properly conducted, users of the Framework will develop a clear picture of needs, problems and their causes, plus a clear and objective picture of the merits of a full range of options to meet those problems. Provided the evidence drives decision-making, this can then lead to the best possible decisions about infrastructure reform or investment.

The Framework is suitable both for an overall planning process for infrastructure that leads to a package of initiatives, and also to describe the process that has led to the identification of a particular initiative.

Figure 1: Stages in the Reform and Investment Framework



Stage 1: Goal Definition

Infrastructure Australia's approach to goal definition invites proponents to describe and map goals and objectives relevant to a proposed set of reforms and investments. In particular, it looks to focus on the alignment of goals and objectives across parties, and to identify other goals and objectives that might be affected by the options and initiatives that arise during later stages of the Framework.

Goal definition should result in a collection of clear statements, whether for a strategic planning or infrastructure decision-making task, that describe the fundamental economic, environmental and social goals that a proponent is looking to achieve. The key for the reform or investment decision-making task is to determine how it will contribute to these goals.

This goal-orientated approach aids in shifting decision-makers' focus towards the achievement of outcomes which can be delivered through a range of mechanisms, and away from decision making that is too readily directed towards investment oriented solutions.

Governments, industry and individual communities around Australia all have a shared interest in Australia's development. As such, they all express their own goals, aspirations and objectives for the nation, jurisdiction, locality and industry sector. If we are to work together rather than against each other, we need to understand how our goals and objectives are aligned at those various levels.

In practice, the high order goals adopted by governments often have a high degree of commonality, because they generally reflect broader economic, environmental and social aspirations. However, as the goals are translated into more specific objectives, the trade-offs between objectives (and, implicitly, the goals they support) become more apparent.

For example, several jurisdictions have published State level plans which set out the Government's high order goals and objectives. Most jurisdictions also have metropolitan planning strategies (although they may be described differently) which set out goals and objectives. In essence, Infrastructure Australia is looking to proponents to demonstrate how their assessment of problems and initiatives is linked to these existing goals and objectives.

In addition, the options and preferred solutions which emerge during Stages 5 and 6 of the Framework may have implications for the attainment of other goals and objectives (i.e. outside the primary goal and objectives to which the task is directed). For example, a task to improve economic development prospects in a particular region through upgrading transport links may lead to increased pressure for new residential development which may in turn overstretch existing water resources (both for potable water and environmental flows). It is therefore important to also be cognisant of other goals and objectives which may be indirectly affected by actions to address the primary goal and objectives.

This is consistent with Infrastructure Australia's mandate to consider infrastructure requirements across a range of infrastructure sectors including water, energy, telecommunications and transport.

The templates invite proponents to provide information setting out the alignment between a proponent's own goals and objectives and those of other governments and parties, whether at a national, State/Territory or local level. For example, Council of Australian Government (COAG) processes are increasingly being used to establish nationally agreed goals and

targets in various domains. For its part, Infrastructure Australia has set out its strategic priorities at a national level (see Table 2 below).[2]

Infrastructure Australia would expect to see some alignment between a proponent's goals and objectives and those of other parties. This will help balance a focus on jurisdictionally specific challenges seen in a range of submissions last time proposals were sought.

Table 2: Infrastructure Australia's Strategic Priorities (SP)

SP1	SP2	SP3	SP4	SP5	SP 6	SP7
Expand Australia's productive capacity	Increase Australia's productivity	Diversify Australia's economic capabilities	Build on Australia's global competitive advantages	Develop our cities and/or regions	Reduce green-house emissions	Improve social equity, and quality of life

[2] See Infrastructure Australia's *Report to Council of Australian Governments*, December 2008, p. 8.

Stage 2: Problem Identification

Initiatives should address clearly identified and specified problems (or challenges): they must have an impact on the problem and lead to medium or long-term results. The identification of the problem being addressed was not clear in many submissions provided to Infrastructure Australia in 2008/09.

The focus of Stage 2 is on the identification of problems that are preventing (or are likely to prevent) the goals and objectives defined in Stage 1 from being achieved.

The process of problem-identification sets the platform to ensure a broad range of interventions are investigated in the Options Generation stage. Crucially, this stage, which is similar to a 'gap' analysis, should look not only at current problems, but also future or emerging issues.

Current Problems

Current problems and their context should be described. The existing situation should be analysed and compared with the goals and objectives. Problems on infrastructure networks need to be identified before the causes and effects of these problems can be analysed. This consists of making meaningful observations about system issues or making sense out of the data displayed in foundation studies on development trends, demographic forecasts, land use requirements, infrastructure systems, feasibility studies, and pre-appraisal reports.

This stage should involve the systematic mapping and quantification of problems. It requires the objective and data-rich identification of deficiencies with the condition and operation of our infrastructure networks and the services they support. Critically, this stage calls on proponents to identify how those problems and deficiencies might hinder the achievement of the goals and objectives set out in Stage 1.

Emerging Problems

Infrastructure planning has often been criticised on the basis that decisions to invest in projects are based on a simple 'predict and provide' methodology. These criticisms have typically been aimed at the failure of project proponents to fully consider a range of scenarios. However, the criticisms are also relevant in other ways.

Notably, both here and overseas, there has been little acknowledgment that various factors (or 'drivers') that shape the future can be largely outside the control of individual governments and others who make infrastructure decisions. If we do not expressly consider those drivers, we run the risk of making sub-optimal infrastructure decisions. Even worse, poorly considered decisions may make the task of achieving our goals harder than might otherwise have been the case.

Depending on the interplay of these drivers, the problems we face today may persist and become more difficult in the future, or they may diminish. Other problems may arise, even though they do not exist at present.

Infrastructure Australia believes that policy and investment decisions should be made having regard to a range of potential views of the future, and that scenario assessment provides the platform for robust decision-making and realisation of goals/outcomes. Infrastructure Australia is therefore looking to proponents to assess whether:

- the problems we face are likely to be enduring and significant under a range of scenarios; and
- (at Stages 5 and 6) whether the options to deal with those problems are likely to be effective under a range of scenarios.

In this context, Infrastructure Australia is looking to proponents to present some scenario analysis at the problem identification/analysis/assessment and options assessment stages of Infrastructure Australia's seven stage framework.

Infrastructure Australia is mindful of the fact that scenario analysis is not yet widely applied. Therefore, at this time, Infrastructure Australia is not proposing a fixed methodology or approach to the scenario analysis. The material below is provided as general guidance.

Scenario Analysis

Scenario analysis is an important tool that can shed light on the implications of strategic risks and uncertainties on the case for introducing infrastructure-related reforms or investing in a project. Scenario analysis is more than just a simple set of sensitivity tests applied to an economic appraisal. It is a structured assessment of linkages between various drivers of change (and potential interactions between the drivers) and potential impacts on our infrastructure networks. Usually, the drivers of change are considered in establishing three or four alternate views (scenarios) of the future.

The level of certainty or uncertainty around individual drivers of change can also be considered and then translated into demands onto systems. The drivers of the future can be clustered and ranked to identify those that are most important for the goals defined during Stage 1, along with the reasons why. Then a range of 'shocks' against these drivers (scenario attributes) are set on which the scenarios can be tested through quantitative and qualitative approaches to explore for 'tipping points', and then compared with the defined goals and objectives.

Scenarios should be plausible and varied. Importantly, they should not be restricted to minor variations to a central 'business as usual' scenario. As well as setting out what the proponent believes to be a 'most likely' or 'business as usual' scenario, it is as well to articulate futures where the drivers of change operate in a materially different way to that used for the 'most likely' scenario. For example, price shocks and technological step changes are valid considerations to build into scenarios. Box 1 provides a description of some of the drivers of change commonly used in scenario analysis.

Box 1: Potential Drivers of the Future

The future is shaped by a range of 'drivers of change' that, to varying degrees, are beyond the control of individual governments or project proponents. The drivers interact to create alternate scenarios or futures. Scenario analysis commonly uses some or all of the six drivers of change set out below. Other change drivers have been used in scenario analysis; however, the following factors are likely to have the greatest significance for Australia's infrastructure systems:

- Socio-demographic change – total population, population mix (especially age profile), population distribution, values;
- Economic change – size and mix of the economy, growth, globalisation, labour markets;
- Energy prices – particularly the potential mix and cost of energy sources for various sectors of the economy;
- Climate change – the impact of change in climate patterns such as temperature, run-off projections, sea level rise and storm surge probabilities on the demand for infrastructure and the maintenance of our existing infrastructure networks;
- Technological change – whether change in technology will reduce or increase the demand for certain infrastructure systems, create entirely new demands; and/or change the way infrastructure systems are built, managed and operated; and
- Governance change – changes in the wider system of government (not individual project governance) that may shape the demand for services and/or the way in which government respond to those demands.

In developing scenarios, it is important that the time horizon for analysis reflects the nature of the problems and challenges to which infrastructure reform and investment should be directed. Some of the challenges, for example those associated with climate change and the availability and cost of various energy sources, have long-term implications. Infrastructure networks also tend to have long lives. For these reasons, scenario analysis frequently involves an assessment of the future over 20, 30 or more years.

Stage 3: Problem Assessment

The Problem Assessment stage involves the calculation of the economic, environmental and social costs of the current or emerging problem. In other words, to what extent does (or will) the problem impact upon the goals and objectives?

This appraisal should primarily be in the form of quantified estimates, though qualitative descriptions will also play an important role, since problems may not be quantifiable given the lack of quality information and data. For example, estimates of the cost of traffic congestion on a link or the carbon cost of burning fossil fuels for electricity should be readily available. However, this quantitative evidence is likely to be supplemented by qualitative information, for instance on the burden congestion imposes on family life, or the social inclusion benefits of high speed broadband for the house-bound.

Stage 4: Problem Analysis

Effective action can only be taken once the underlying cause of a problem has been diagnosed. The cause may be a market failure of some kind or a government failure in terms of planning.

The crucial substantive element at this stage is to understand cause and effect, i.e. to probe the causes or explanations behind the observed problem and to identify the causes rather than the symptoms of the problems. Assessing a problem in terms of its symptoms obscures the real cause and leads to symptomatic solutions that fail to correct the basic issues and condition.

Proponents should demonstrate an understanding of why the problem has or will occur, and directly link this understanding to the identification of potential solutions in the next stage of the framework.

Stage 5: Option Generation

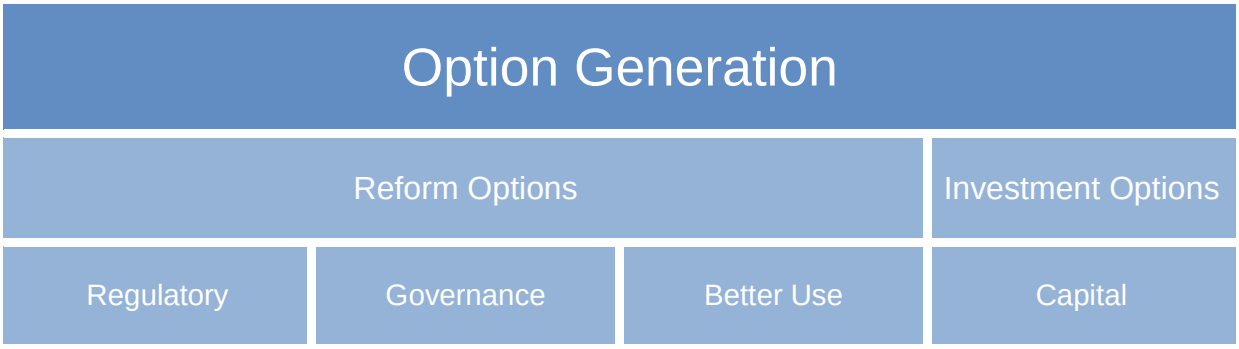
Infrastructure Australia's approach to infrastructure planning and investment has consistently emphasised the principle that infrastructure policy should include both supply and demand-side solutions.[3]

In light of this principle, once rigorous problem identification, assessment and analysis has been undertaken, a broad spectrum of options should be developed. The spectrum of options should represent a range of reasonable alternatives (both conventional and un-conventional) to solve the problems.

As outlined in its December 2008 report, Infrastructure Australia notes that significant aspects of the ongoing national demand-side reform agenda remains unfinished. It further notes that, given the potential for these reforms to address many of the problems facing infrastructure networks today, many capital investments should only take place *after* reforms are in place – and not before.

Figure 2 sets out graphically a possible framework for considering the range of reform and investment options.

Figure 2: Model for Considering Reform and Investment Options



Reform options are likely to include:

Regulatory initiatives:

- Changes to the way both infrastructure and infrastructure services markets are regulated from a competition perspective, for example changes to regulatory regimes, access regimes, market structures and frameworks;
- Changes to the regulations surrounding markets: safety; environmental; technical standards; licensing; and
- Changes to land use and development planning and control to provide a land use solution to infrastructure issues.

Governance initiatives:

[3] See, for example, Infrastructure Australia's *Report to the Council of Australian Governments,* December 2008, p.8.

- Changes to administrative and institutional frameworks, such as public service delivery processes, approval processes, coordination and cooperation processes, assurance processes, contractual provisions, and funding agreements.

Better use initiatives:

- Technological innovations: intelligent active management systems, e.g. intelligent transport systems, smartcards, smart metering, product technical standards e.g. energy efficiency standards;
- Influencing behaviors through information: workplace practices, workplace travel planning; information labeling for energy and water intensive products; and
- Economic pricing and charging – the introduction of full economic pricing of energy and water sectors; for instance time of day pricing for transport and energy; full cost recovery pricing for water.

A key element of Options Generation is the consideration of how individual options can be packaged together – or better coordinated - for a more efficient and effective outcome.

Stage 6: Options Assessment

Once a range of options has been identified, a structured process should be used to assess those options and, on the basis of their merit, move from a longer list of potential options to a shorter list of potential solutions.

The process of narrowing down options should be structured, objective, and evidence-based. Options should not be ruled out on the basis of prejudice, political and presentational difficulties, or in any way which precludes genuine consideration of certain options. Options should be ruled out only on the basis that they do not address the problem in an efficient way.

To give an indication of the type of structure required, the following three step outline process is offered:

1. *Step one* could be a quantitative Multi Criteria Analysis (MCA) of the long list of options, showing, at a high level, each option's impact on the goals and objectives identified in Stage 1 of the overall Reform and Investment Framework. The best performing options move to step two:
2. *Step two* could be a rapid, or high level, cost-benefit analysis of a shorter list of options; alongside a more detailed MCA to pick up any impacts not captured in the rapid economic appraisal. The best performing options move to step three:
3. *Step three* would complement the more detailed MCA analysis with a thorough and detailed economic cost-benefit analysis of, for example, the two or three lead options.

Infrastructure Australia is mindful of the fact that scenario analysis is not yet widely applied. Therefore, as part of any submission made by proponents, we are not expecting detailed modelling of a project's costs and benefits under different scenarios. Rather, we are looking to proponents to provide a qualitative assessment of:

- the impact(s) of different scenarios on an initiative's strategic fit (ie whether a potential initiative's ability to contribute to the goals and objectives identified in Stage One is stronger or weaker under different scenarios); and
- the likely impact of the scenario on the project's costs and benefits.

Clearly, if explicit modelling of alternate scenarios is available, Infrastructure Australia would seek to view the outputs of that modelling.

Infrastructure Australia's Requirements for Detailed Economic Appraisal

Regardless of the process used to narrow down options, all initiatives proposed to Infrastructure Australia - i.e. the specific initiative(s) which emerge from the assessment of options at Stage 6 - should include a thorough and detailed economic cost-benefit analysis.

In doing so, proponents must:

1. **Submit robust and objective Benefit Cost Analysis which is supported by strong evidence.** In order to demonstrate that the Benefit Cost Analysis is indeed robust, full transparency of the assumptions, parameters and values which are used in each Benefit Cost Analysis is required. In addition, substantial supporting evidence to demonstrate that the input data underpinning the Benefit Cost Analysis - notably the demand/price forecasts, and capital/operational costs are justified - is also required. Clearly, independent verification of these elements will offer a greater degree of confidence that the data is robust.

2. **Consider as many monetised economic benefits and costs as possible.** Developments in Benefit Cost Analysis methodologies mean that direct impacts such as noise, landscape and health can, in many circumstances, be monetised.

   All benefits and costs included in the Benefit Cost Analysis should be economic impacts and not simply transfers, second round effects, or financial in nature; all impacts should be incremental; and should all be directly associated with the initiative.[4]

3. **Consider non-monetised benefits and costs.** Where impacts cannot be robustly expressed in money units ('non-monetised'), Infrastructure Australia will nevertheless incorporate them into the appraisal process and requests proponents to provide supporting information on the scale of these impacts.

4. **Consider both the overall efficiency of an initiative (the combined scale of benefits and costs), as well as its equity and distributional impacts.** Efficiency is determined by comparing the benefits and costs of an initiative – it specifically addresses the question: "When all the benefits and costs are combined, will the initiative deliver net benefits (i.e. benefits in excess of costs)?" Equity and distributional impacts relate to who bears the benefits and costs. Thus, to aid its decision making, Infrastructure Australia not only requires the Benefit Cost Ratio as a measure of net benefit, but also a breakdown of who is likely to bear the benefits and costs, and when.

5. **Consider issues of risk and uncertainty.** Infrastructure Australia is fully aware that the future cannot be predicted with certainty, and that economic growth, individuals' behaviour, oil prices, carbon prices and so on may vary over time. To ensure that the appraisal process is robust to potential changes, Infrastructure Australia requests a series of sensitivity tests of the demand modelling and Benefit Cost Analysis results.

Infrastructure Australia requires all proponents to submit detailed appraisal information in support of all initiatives. This should provide complete transparency of data, assumptions, and methodologies used; comprehensive supporting evidence to justify assumptions, including independent verification of demand forecasts and costings where possible; and a detailed picture of the results of the appraisal.

For more details on the approach adopted by Infrastructure Australia for transport initiatives, and the information required, please refer to the templates provided online. For other sectors a similar level of detail should be provided using relevant sector practice, in particular those required by independent regulators.

[4] 'Wider Economic Impacts' for transport initiatives (the templates define these impacts) may also be considered for certain initiatives in specific circumstances. However, given the infancy of calculating these impacts, it is recommended that proponents discuss the analysis with Infrastructure Australia before proceeding with their estimation.

Stage 7: Solution Prioritisation

Stage 7 aims to bring together the analysis from the preceding six stages into a 'snapshot' of the specific initiative that the proponent is presenting for Infrastructure Australia's consideration, ie the initiative which emerges at the end of Stage 6.

It involves three components:

- strategic fit and profiling;
- appraisal; and
- deliverability.

Strategic Fit and Profiling

The profiling component of the Infrastructure Australia's infrastructure planning process assesses the compatibility of the range of initiatives to Infrastructure Australia's strategic priorities.

The profiling of initiatives needs to outline (i) how the strategic priorities are to be addressed by the initiative; and (ii) how the initiative may be linked with (or dependent on) other complementary and dependent initiatives such as policy, regulatory, demand and pricing solutions, enhancement and capital investment solutions.

Profiling creates the coherent argument as to why the initiative is being considered in the first place and what it seeks to achieve in terms of meeting Infrastructure Australia's strategic priorities.

Supporting evidence for Infrastructure Australia's assessment of the profiling component will be drawn from information provided in the first 6 stages of the framework.

Appraisal

The appraisal component of the Infrastructure Australia's infrastructure planning process adopts 'monetised' cost-benefit analysis as its core tool. This is complemented by 'non-monetised' effects. Together, a picture of the full economic, environmental and social merits of each initiative can be determined.

Further detail on Infrastructure Australia's approach to appraisal is provided under Stage 6 above and is provided in templates online.

Deliverability

It is not sufficient that a project has a good fit with Infrastructure Australia's strategic priorities and has a high benefit-cost ratio. Proponents also need to demonstrate that the proposed delivery arrangements for an initiative will not compromise the achievement of strategic priorities or economic benefits that it promises.

The deliverability component assesses funding, service delivery, governance, procurement and risk management approaches that are proposed. Further detail on Infrastructure Australia's approach to deliverability is provided in templates online.