



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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1 Introduction

Infrastructure Australia's purpose is to advise Australian Governments, infrastructure investors and infrastructure owners on Australia's nationally significant infrastructure priorities now and in the future. In addition, Infrastructure Australia advises Australian Governments on the needs of users, mechanisms for financing infrastructure, and the infrastructure policies and reforms vital to drive Australia's economic, social and environmental success.

The *Infrastructure Australia Act 2008* defines nationally significant infrastructure as being across four sectors where investment or further investment will materially improve national productivity:

- (a) transport infrastructure;
- (b) energy infrastructure;
- (c) communications infrastructure; and
- (d) water infrastructure.

Infrastructure Australia's December 2008 *Report to the Council of Australian Governments*¹, and subsequent annual reports identify, on the basis of submissions received and Infrastructure Australia's own analysis, seven key themes for action across the four sectors:

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

¹ Available at www.infrastructureaustralia.gov.au/coag/index.aspx

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 state and territory governments 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.

In addition, it is important to note that Infrastructure Australia takes a long term, national 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.

Given Infrastructure Australia's national approach to infrastructure planning, Infrastructure Australia released its Reform and Investment 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 structured 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.

Section three of this document sets out the seven steps of the Framework in full.

2 Updating the National Infrastructure Pipeline

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 focused on further developing the initiatives on the National Infrastructure Pipeline, and working with proponents to develop robust business cases for those initiatives so that final decisions can be taken to classify them as “ready to proceed” if the evidence supports that conclusion.

At the same time, Infrastructure Australia will also consider new proposals for reform and investment initiatives which support the seven themes for action, including proposals which should form part of the national strategies that have been developed under several of those themes. Infrastructure Australia is working closely with State and Territory Governments because of their prime responsibility for Infrastructure planning and implementation within their boundaries. With the introduction of the Infrastructure Tax Incentive for Designated Infrastructure Projects, Infrastructure Australia welcomes submissions from other proponents.

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 submissions for support for reform and investment initiatives which:

- Form part of a set of coherent proposals for a long-term package of reforms (for example, demand management measures and governance arrangements) 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 reflect the national strategies that have been 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; capital and operating cost estimates, and economic cost-benefit analysis.

In addition, Infrastructure Australia will only consider initiatives for inclusion on the infrastructure priority list with a capital cost threshold of \$100 million, except in relation to initiatives that demonstrate unique national interest qualities.

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 analytical rigour that has been applied in planning and investment decisions, which is a fundamental requirement to underpin a request for support from Infrastructure Australia.

Infrastructure Australia expects that the information and evidence it requires will generally already be available to proponents, since the stages within the framework ought to be 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.

Any submission which is seeking a funding decision will need to meet all these requirements, since Infrastructure Australia will only give advice to Governments (often in relation to hundreds of millions of dollars of public funds) on the basis of a comprehensive and robust evidence base. However, where a submission seeks engagement with Infrastructure Australia as a business case is developed – that is, the initiative is at an early stage of planning - Infrastructure Australia welcomes such engagement and the supporting information should be in accordance with the initiative's stage of development and need not necessarily cover all the elements described here). Therefore, 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.

Submissions can be made at any time with updates to the national infrastructure priority list in March, June and November of each year. Details of submission deadlines for each priority list update are available on the Infrastructure Australia website at http://www.infrastructureaustralia.gov.au/priority_list/index.aspx

Submissions should be lodged using Infrastructure Australia's online portal at www.infrastructureaustralia.gov.au/infrastructure_priority_list.

Submission of Programs

Programs of work may be submitted to Infrastructure Australia and will be assessed against the Reform and Investment Framework considering the merits of the overall program. For individual initiatives from the program to be recommended for funding, they must meet the requirements for Ready to Proceed. This requires a detailed cost benefit analysis and deliverability assessment.

Tax Incentives

New tax incentives to support private sector investment in nationally significant infrastructure have been introduced, and take effect on 19 August 2013.

Under the new tax provisions, an infrastructure project that is designated by the Infrastructure Coordinator as a 'designated infrastructure project' is entitled to:

- Uplift tax losses by the long-term government bond rate;
- Carry forward tax losses and claim bad debt deductions even where that entity does not satisfy the continuity of ownership and same business tests for companies and equivalent tests for trusts.

The intent of these initiatives is to ensure that investors are not discouraged from investing in infrastructure because of the reduction in the present value of losses over time, and to increase the likelihood that the losses can be used to offset future earnings and benefit investors in the project, whether these are the original investors or are new investors in the project.

Consistent with the objective of supporting private investment in nationally significant infrastructure, a key requirement to be eligible for consideration for designation, projects must first have achieved 'Threshold' or 'Ready to Proceed' status on Infrastructure Australia's Infrastructure Priority List. Specifically:

- Threshold and Ready to Proceed initiatives are eligible for provisional designation; and
- Ready to Proceed initiatives are eligible for designation.

Projects can only be designated if the total capital expenditure of all designated projects (including provisionally designated projects) would not exceed \$25 billion.

Applications for the designation itself are subject to separate guidance which are listed at www.infrastructureaustralia.gov.au, and are subject to an application fee.

Transparency

Many of the proposals made to Infrastructure Australia have been 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, all 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.

Information submitted confidentially will not be released or published by infrastructure Australia or the National Infrastructure Coordinator without the written consent of the proponent. There may be a legal requirement for information to be released under the Freedom of Information Act 1982, however any such release will be undertaken in consultation with the proponent.

Infrastructure Australia's methodology for assessing initiatives rests on three discrete components:

1. *The initiative's strategic fit and profiling* – the extent to which the proposal addresses national infrastructure priorities and is supported by data rich evidence of the scale and causes of underlying problem(s) to enable consideration of effective and targeted solutions;
2. *Economic viability* – the proposal's lifetime benefits must significantly outweigh its lifetime costs to society; and
3. *Deliverability* – the proposal must have a clear and robust delivery plan to ensure its successful realisation.

In addition, as a fundamental principle, Infrastructure Australia will only make advisory recommendations on the basis of robust, comprehensive and objective evidence and data.

The assessments are conducted in a consistent and structured manner, utilising a range of qualitative and quantitative processes:

1. The *strategic fit* assessment process captures the extent to which the proposal meets a range of strategic policy goals, assesses the balance between impacts, and picks up long term impacts that are not captured in traditional appraisal. It tests whether there is a comprehensive understanding of the nature of the problem it seeks to solve and whether the root causes of the problem are identified. It also captures the extent to which a proposal is embedded in long term planning (that is, is this a major problem and how does it fit into the infrastructure network?); the extent to which a range of solutions have been considered; and whether there is compelling evidence that the preferred solution is the best response to the problem.
2. The second stage – *economic viability* – seeks to establish whether a proposal's benefits to the community as a whole outweigh its costs to society. The bedrock of this assessment is a traditional, and widely understood, monetised cost benefit analysis, complemented by qualitative analysis of impacts where monetisation is not feasible.

In process terms, independent economic appraisal experts scrutinise submissions to ensure they are robust and comparable, using a standardised pro-forma of 'issues for investigation' prepared by Infrastructure Australia, as well as bringing their own expertise to identify issues in any aspect of the business case.

3. The *deliverability assessment* tests the extent to which the delivery of the initiative maintains the proposed strategic and economic benefits. It does this by examining how well developed the initiative is, particularly in its identification and assessment of risk. It then examines how the initiative proposes to manage the key risks, including through existing and proposed approaches to consultation with stakeholders, technical options analysis, planning and environmental approvals, procurement, design and construction, and operations and maintenance of the infrastructure.

The deliverability assessment also considers the appropriateness of proposed funding and financing arrangements for an initiative.

- Where the initiative will operate within a market environment, the deliverability assessment will test whether appropriate consideration has been taken of the ability of users to fund the initiative. For example, in the water and energy sectors, as a starting point, Infrastructure Australia would want to understand why regulated prices could not recover the full cost of the initiative. Where market failure is proposed as a reason for supplemental funding, Infrastructure Australia would expect to see the nature of the market failure explained and analysed. It would also expect a full exploration of reform options for resolving the cause of the market failure, prior to consideration of non-market interventions. The deliverability assessment will also test the appropriate form of any supplemental government funding (grant/debt/equity).
- The deliverability assessment tests whether the proponent has given adequate consideration to the potential for private financing to deliver value for money.

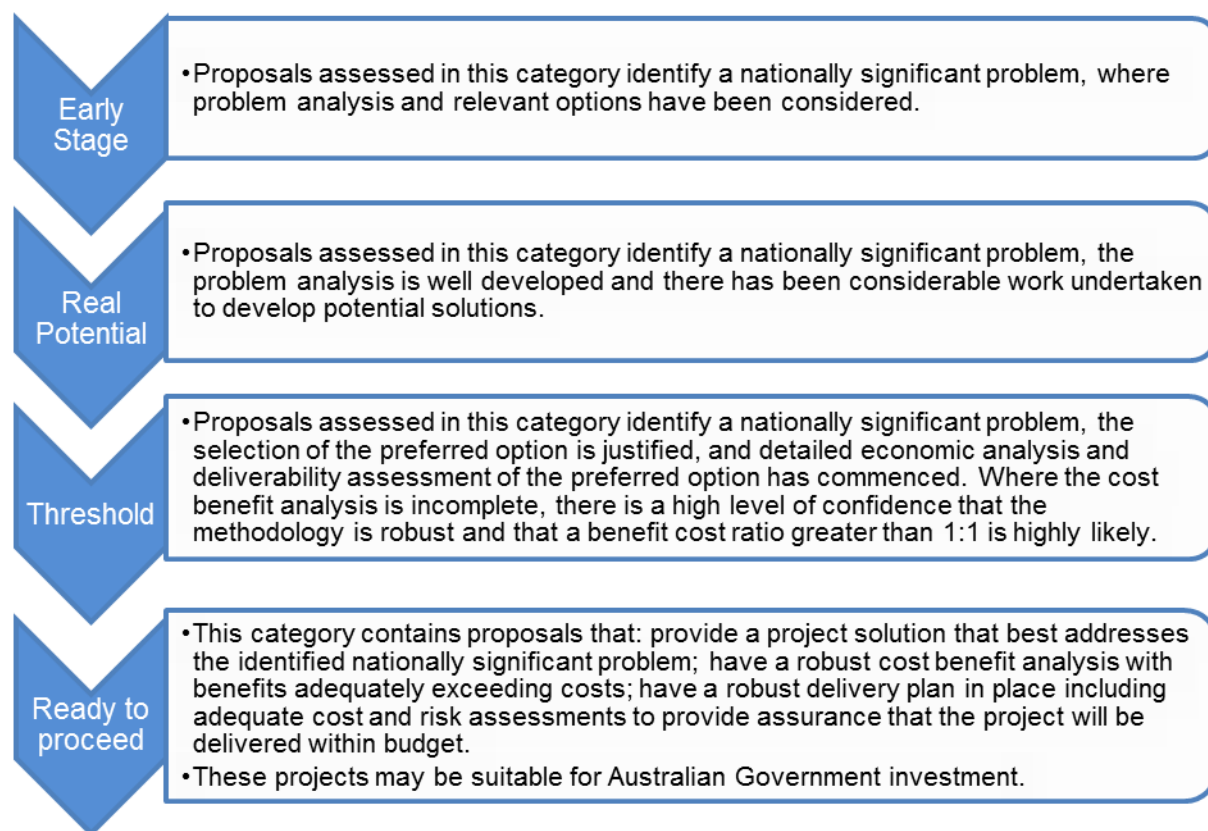
Infrastructure Priority List – classification of initiatives

Infrastructure Australia presents the result of its assessment process in the Infrastructure Priority List.

Infrastructure Australia believes that reforms to ensure existing infrastructure is better used should be a top priority for Australia; as such reforms have significant economic, social and environmental benefits with less financial and other costs than investment in new capacity. As a result, the Pipeline includes new capacity investments and a series of better use measures and regulatory/pricing reform recommendations which are developed through national strategy work led by Infrastructure Australia.

The Pipeline is split into four distinct categories to provide greater transparency as to the potential of the initiatives and their stage of development. It should be noted that any initiative that has been submitted to Infrastructure Australia, but which does not appear on the Pipeline, has been assessed as not addressing a nationally significant issue or problem and/or not meeting Infrastructure Australia's strategic priorities.

The four Pipeline categories are:



Public or private funding?

The Pipeline is therefore an assessment of the intrinsic merits of a proposal, and is designed to advise governments, the sector and the public as to the nation's infrastructure priorities. This does not necessarily mean that Infrastructure Australia believes that a proposal should receive public funding support. Indeed, in many cases proposals will be readily fundable through user charges (eg energy capacity investments, water networks) based on the operation of private companies or publicly owned utilities in a (often regulated) market. Infrastructure Australia will indicate, on a case by case basis, whether it believes public funding is required in order to ensure a national infrastructure priority goes ahead.

In addition, Infrastructure Australia will make recommendations to Government in relation to initiatives it would support being considered for planning and/initiative development work (including design). Infrastructure Australia proposes to base its assessment in this regard upon:

- (1) the scale and urgency of the problem/challenge that has been identified; and
- (2) the scope for development and application of complementary reform initiatives.

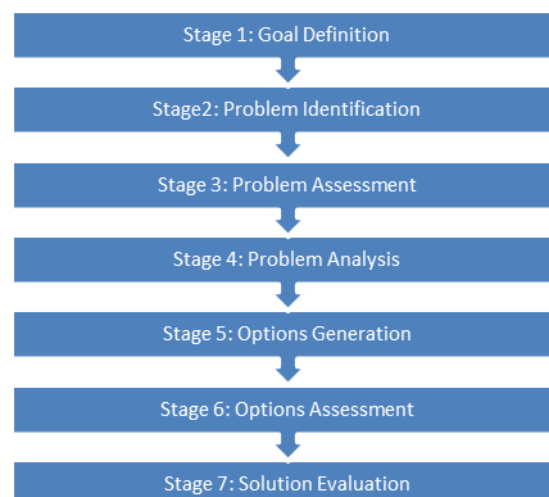
3 The Reform and Investment Framework in Detail

Infrastructure Australia's Reform and Investment 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



Together, the seven stages outlined above bring together information on each initiative to enable Infrastructure Australia's consideration against the three assessment components:

Strategic Fit and Profiling (Stages 1-6)

The profiling component of the Infrastructure Australia's infrastructure planning process assesses the compatibility of initiatives with Infrastructure Australia's strategic priorities. It also considers alignment with the goals and objectives of other parties including state/territory, regional, local governments and across sectors.

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.

Profiling also seeks to understand the nature of the problem that an initiative seeks to solve and its costs. It tests whether there is a comprehensive understanding of the nature of the problem, whether the root causes of the problem are identified, and whether there is evidence that demonstrates how it prevents stated goals being achieved.

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

Economic viability (Stage 7)

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 in sector-specific Stage 7 templates online.

Deliverability (Stage 7)

It is not sufficient that an initiative 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 Stage 7 templates online.

Table 1: Infrastructure Australia's Reform and Investment Framework

Core component	Stage and purpose	Early stage	Real potential	Threshold	Ready to Proceed
Strategic Alignment and Profiling The proposal relates to clear goals that address national infrastructure priorities The problem being addressed is well understood and constrains achievement of stated goals The costs of the problem and potential benefits of the solution are presented and supported by evidence Understanding causes allows effective and targeted solutions to be created	1. Goal Definition Identify goals that are: clearly defined; are relevant to the problems identified; and drive the development of solutions	- Stages 1-5 templates completed - Proposals in this category identify a nationally significant problem. - Problem assessment and analysis is well developed	- Stages 1-6 templates completed - Proposals in this category identify a nationally significant problem - Problem assessment and analysis is well developed	- Stages 1-7 templates completed - Proposals in this category identify a nationally significant problem with problem analysis - Problem assessment and analysis is well developed	- Stages 1-7 templates completed - Proposals in this category identify a nationally significant problem with problem analysis - Problem assessment and analysis is well developed
	2. Problem Identification Demonstrate that problems identified are a constraint on the achievement of stated goals				
	3. Problem Assessment Demonstrate with data rich evidence that it is a priority to address the problem				
	4. Problem Analysis Analyse the extent of problems and the root causes				
	5. Option Generation Develop a full range of possible options to solve the problem, including reform and Investment proposals	- Stages 1-5 templates completed - Reform and investment options have been identified (e.g. reduce demand, improve productivity, increase supply)	- Stages 1-6 templates completed - A comprehensive list of reform and investment options has been identified - There has been considerable work undertaken to develop and analyse potential options	- Stages 1-7 templates completed - A comprehensive list of reform and investment options has been identified - There has been considerable work undertaken to develop and analyse potential options - Selection of the preferred option is justified	- Stages 1-7 templates completed - A comprehensive list of reform and investment options has been identified - There has been considerable work undertaken to develop and analyse potential options - Selection of the preferred option is justified
	6. Option Assessment Undertake strategic analysis and cost benefit analysis to assess the viability of the options	Option assessment not required			
Economic viability The proposal's lifetime benefits must significantly outweigh its lifetime costs to society Deliverability The proposal must have a clear and robust delivery plan to ensure its successful realisation	7. Solution evaluation - Detailed business case for the preferred option including: - Detailed cost benefit analysis - Deliverability (including cost, risk and procurement)	Solutions not required	There has been considerable work undertaken to develop and analyse potential options	- Stages 1-7 templates completed - Detailed economic analysis and deliverability assessment of the preferred option has commenced - Where the cost benefit analysis is incomplete, there is a high level of confidence that the methodology is robust and that a benefit cost ratio greater than 1:1 is highly likely - Risk based cost estimates have been used in cost benefit analysis and in the funding request - A delivery plan is at an advanced stage of development - Where government funding is likely to be sought, analysis of scope for private funding is at an advanced stage of development.	- Stages 1-7 templates completed - Analysis justifies that the solution will best address the identified nationally significant problem - A robust cost benefit analysis has been undertaken and benefits exceed costs - Risk based cost estimates have been used in cost benefit analysis and in the funding request - Financial model has been developed demonstrating the viability gap and exploring options for, and impact of, different - A robust delivery plan is in place including adequate cost and risk assessments to provide assurance that the initiative will be delivered within budget - Where government funding is likely to be sought, analysis of scope for private funding is completed. - The risk based cost estimate, risk assessment, demand models and economic appraisal have been independently reviewed.

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 – including private sector 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 (ie 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 for all proponents 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, communications 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 processes are frequently 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 address a focus on jurisdictionally specific challenges, which is often a weakness of submissions.

Table 2: Infrastructure Australia's Strategic Priorities

Strategic Priority 1	Strategic Priority 2	Strategic Priority 3	Strategic Priority 4	Strategic Priority 5	Strategic Priority 6	Strategic Priority 7
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 Identification³

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.

In turn, initiatives should address those clearly identified and specified problems (or opportunities/challenges): they must have an impact on the problem and lead to medium or long-term results.

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 initiative 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.

³ The use of the term 'problem' should not be interpreted to mean there is a focus on negatives. The term 'problem' is used throughout these guidelines for clarity, but it should be interpreted to cover a range of issues, many of which will be positive in nature, for instance how to best transport minerals from mine to port for export.

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 an initiative. 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 initiative 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 initiative 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 set out in Stage 1?

This appraisal should primarily be in the form of quantified estimates to demonstrate the scale and extent of key problems and issues. 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, ie 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 conditions.

Proponents should demonstrate an understanding of why the problem has arisen 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.⁴

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 unconventional) to solve the problems.

As outlined in its December 2008 report, and various subsequent reports, 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

Regulatory reform	Governance reform	Better Use reform	Capital Investment
• regulatory or access regimes • market structures and frameworks • safety and environmental standards • licensing • land use and planning controls	• administrative and institutional frameworks • public service delivery processes approval processes • coordination processes • contractual provisions • funding agreements	• active management systems • intelligent transport systems • smartcards • smart metering Influencing behaviour: • economic charging • demand management	• Expansion of existing infrastructure • New infrastructure

⁴ See, for example, Infrastructure Australia's *Report to the Council of Australian Governments*, December 2008, p.8.

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:

- 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, eg intelligent transport systems, smartcards, smart metering, product technical standards eg energy efficiency standards;
- Influencing behaviours 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 or 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 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 multi criteria analysis 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 multi criteria analysis with a 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 an initiative'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 1 is stronger or weaker under different scenarios); and
- The likely impact of the scenario on the initiative'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 are outlined in Stage 7 below.

Stage 7: Solution Evaluation

Stage 7 involves presentation detailed analysis of the proponent's preferred option that is of sufficient detail to understand and assess:

- Economic viability – the proposal's lifetime benefits must significantly outweigh its lifetime costs to society; and
- Deliverability – the proposal must have a clear and robust delivery plan to ensure its successful realisation.

Infrastructure Australia's Requirements for Detailed Economic Appraisal

Regardless of the process used to narrow down options in Stage 6, all initiatives proposed to Infrastructure Australia - ie the specific initiative(s) that emerge from the assessment of options as part of strategic fit and profiling - should include a thorough and detailed economic cost-benefit analysis in Stage 7. In preparing and presenting results of detailed economic appraisal, proponents must:

1. **Submit robust and objective cost benefit analysis which is supported by strong evidence.** In order to demonstrate that the cost benefit analysis is indeed robust, full transparency of the assumptions, parameters and values which are used in each cost benefit analysis is required. In addition, substantial supporting evidence to demonstrate that the input data underpinning the cost benefit 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 cost benefit analysis methodologies mean that impacts such as noise and greenhouse can, in many circumstances, be monetised. Infrastructure Australia seeks proponents to capture impacts on a range of stakeholders to reflect the community-wide perspective of cost benefit analysis. In addition, highly beneficial or detrimental impacts should be monetised wherever possible, particularly if this benefit is the primary purpose of the initiative. All benefits and costs included in the cost benefit analysis should be economic impacts and not simply financial transfers between parties, or second round effects; all impacts should be incremental; and should all be directly associated with the initiative.
3. **Consider non-monetised benefits and costs.** Where impacts cannot be robustly expressed in monetary 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 (ie 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 cost benefit 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 to cost/benefit analysis adopted by Infrastructure Australia and the information required, please refer to the sector-specific templates provided online.

Deliverability

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

Infrastructure Australia requires proponents to establish that the initiative is well developed, particularly in its identification and assessment of risk. Infrastructure Australia will also consider the appropriateness of proposed funding and financing arrangements for each initiative. This requires detail on funding, service delivery, governance and procurement approaches that are proposed. Further detail on Infrastructure Australia's approach to deliverability is provided in templates online.

Reporting and Documentation

The results of the appraisal need to form a central element of the business case for each proposal submitted to Infrastructure Australia. The appraisal needs to comply with this guide. Proponents need to provide Infrastructure Australia with:

- Completed templates for Stages 1 – 7;
- A full Business Case; and
- Where available, a series of supporting documentation, including a detailed:
 - A detailed, independent, report setting out predicted demand and the basis/drivers for any changes in demand;
 - A detailed, independent specialist's review of the proponent's cost estimate; and
 - A detailed report of the economic appraisal methodology, including a full explanation of all parameters used and sensitivity tests applied.