



FINAL REPORT

Infrastructure Australia Assessment Framework Review

Report of the 2020 Review of the Infrastructure Australia Assessment Framework

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Infrastructure Australia
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Executive summary

The Infrastructure Australia Assessment Framework (Assessment Framework) sets out the method used by Infrastructure Australia (IA) to assess investment proposals for nationally significant infrastructure. The Assessment Framework provides proponents with information and guidelines for making submissions and includes IA's social cost-benefit analysis (CBA) methodology guidelines. The *Infrastructure Australia Act 2008* (Cth) requires that IA undertakes a review of the CBA methodology guidance in the Assessment Framework every 24 months to consider whether the methodology adequately takes into account social, environmental and economic costs and benefits. This methodology was last reviewed in March 2018.¹

The CIE has been asked to conduct an independent review of the CBA method outlined in the current Assessment Framework.²

Overall, the current Assessment Framework CBA methodology is fit for purpose. We believe the guidance provides an accurate view of the steps for undertaking an unbiased and objective CBA.

We have identified some recommendations to improve the Assessment framework guidance, summarised in table 1.

1 CBA methodology recommendations

Finding	Description	Recommended change or for consideration
Specification of base case	Consider accepting base case specification with future investment included, so long as the base case does not include investment which is either complementary to the project being evaluated or a major substitute to the project being evaluated. Conflicting jurisdiction and IA guidance around the base case specification may duplicate analysis for proponents.	For consideration
Capital cost treatment	Provide clarity around whether proponents should use P50 or P90 cost estimates, or which cost estimate is preferred by IA for the central case.	Recommended
Quantifying land use impacts	The Assessment Framework provides guidance around the measurement of land use benefits and is open to wide interpretation. More prescriptive guidance and worked examples are recommended. Post completion review guidance should be updated with respect to the data collection required to measure actual land use impacts.	Recommended

¹ Deloitte 2018, Report on the 2017 review of the Infrastructure Australia Assessment Framework 2018 Update, prepared for Infrastructure Australia, 5 March 2018.

² Infrastructure Australia 2018, Assessment Framework, March 2018.

Finding	Description	Recommended change or for consideration
Place-based guidance	Provide specific guidance and worked examples for the evaluation of place-based projects.	Recommended
Equity and distributional impacts	Provide greater guidance around assessing equity and distributional impacts, including whether CBA is the appropriate tool for this, or remove references to distributional and equity impacts in the Assessment Framework.	Recommended
Changes to supporting guidelines	Future versions of the Assessment Framework should incorporate revisions from the supporting guidelines, such as ATAP guidelines for transport initiatives.	Recommended
Climate change and resilience	<ul style="list-style-type: none"> ▪ The Assessment Framework provides guidance around climate change risks. There is an opportunity to enhance this with guidance on designing and planning infrastructure, in response to the impacts of climate change. ▪ Provide additional guidance around measuring the resilience of infrastructure. 	Recommended
Discount rates	IA should consider whether the current discount rates in the Assessment Framework are appropriate given reductions in the cost of capital in financial markets and for regulated utilities.	For consideration
Uncertainty	The previous review of the Assessment Framework recommended ordering benefit and cost items by certainty. This would help stakeholders better focus their efforts around quantifying less speculative benefits.	Recommended
Delay/deferral	The Assessment Framework should require all projects to include a sensitivity test for deferring the project.	Recommended
Measurement of consumer surplus	Consider providing detailed information around measuring consumer and producer surplus, including technical guidance, graphs and equations.	For consideration

Source: CIE.

1 Background

The Infrastructure Australia Assessment Framework

The Infrastructure Australia Assessment Framework (Assessment Framework) sets out the method used by Infrastructure Australia (IA) to assess investment proposals for nationally significant infrastructure. The Assessment Framework provides proponents with information and guidelines for making submissions and includes the five stage assessment process, information to be provided by the proponent, the criteria used to assess submissions, guidance around the development of submissions and submission templates and checklists.

The Assessment Framework covers investment proposals from beginning to end and consists of the following stages:

- Stage 1: Problem identification and prioritisation
- Stage 2: Initiative identification and options development
- Stage 3: Business case development
- Stage 4: Business case assessment
- Stage 5: Post completions

The *Infrastructure Australia Act 2008* (Cth) states that all proposals submitted to IA for business case assessment should include a thorough and detailed cost-benefit analysis (CBA). Accordingly, the Assessment Framework provides specific guidance around the CBA method. The Assessment Framework was last updated in March 2018.

This review

The CIE has been asked to conduct an independent review of the CBA method outlined in the current Assessment Framework.³

The *Infrastructure Australia Act 2008* (Cth) requires that IA undertakes a review of the CBA methodology in the Assessment Framework every 24 months. This guidance was last reviewed in March 2018.⁴

³ Infrastructure Australia 2018, Assessment Framework, March 2018.

⁴ Deloitte 2018, Report on the 2017 review of the Infrastructure Australia Assessment Framework 2018 Update, prepared for Infrastructure Australia, 5 March 2018.

The review is focused on the CBA methodology rather than the implementation of this by proponents. Project CBAs are evaluated by IA during their Stage 4 Business Case Assessment.⁵

This review has consisted of:

- reviewing the March 2018 Assessment Framework CBA methodology for appropriateness, clarity and usability for practitioners
- reviewing alignment of the CBA methodology to the supporting guidelines, such as Australian Transport Assessment and Planning (ATAP) guidelines
- reviewing whether changes raised in previous reviews have been incorporated into the Assessment Framework, and
- identifying areas which require update or additional guidance.

The review has also considered feedback and comments provided by stakeholders which include:

- proponents who submit proposals to IA
- infrastructure bodies representing different states and territories, and
- commonwealth and state government departments.

This information has been collected through ongoing interactions between IA and its stakeholders as well as through formal interviews conducted by customer experience consultancies. The feedback, relating to the CBA methodology, recommended:

- developing CBA worked examples and implementing best practice methodologies for each infrastructure type. Feedback indicated that proponents are seeking additional guidance on best practice methodologies to be provided in the Assessment Framework and IA's expectations across infrastructure types.
- harmonising CBA guidance and approaches across jurisdictions. Feedback indicated that overlapping jurisdictional and IA processes sometimes require repeated tasks for proponents.

Social cost-benefit analysis

Social cost-benefit analysis (CBA) is an economic analysis technique for assessing the economic merit of a proposed initiative by assessing the benefits and costs to society of the initiative over an appraisal period. It is concerned with measuring the changes in welfare from an initiative, as distinct from financial analysis which focuses on measuring actual cash flows. Gains and losses are valued in monetary terms, allowing the economic merits of initiatives to be compared across projects in different sectors of the economy. A CBA can help inform decision-maker and stakeholder views as to whether the community will be made worse off or better off, in economic terms, as a result of a project.

⁵ Project business case evaluation summaries are published on the IA website here: <<https://www.infrastructureaustralia.gov.au/project-evaluations/past-evaluations>>.

The key steps in a CBA are:⁶

- 1 Articulate the decision being evaluated. This could be an investment in new infrastructure or change in regulatory arrangements for existing infrastructure.
- 2 Develop the base case and options (or policy interventions). The base case is the state of the world in the absence of the proposed initiative. Costs and benefits of options are compared to the base case.
- 3 Identify, quantify and monetise the costs of the base case and the options.
- 4 Identify, quantify and monetise the benefits of the base case and options.
- 5 Generate the incremental appraisal metrics of each option. This compares the costs and benefits of the options to the costs and benefits under the base case. Appraisal metrics may include:
 - a) Net Present Value (NPV), which compares the discounted benefit minus costs for an option to the discounted benefits minus costs for the base case. The option with the largest NPV will usually be the preferred option and NPV is generally the decision rule used in CBA.
 - b) Benefit Cost Ratio (BCR), which is the present value of benefits for the option minus the present value of benefits for the base case divided by the present value of costs of the option minus the present value of costs for the base case. A BCR above 1 implies the benefits of an initiative are greater than the cost, relative to the base case.
- 6 Undertake sensitivity analysis. This involves changing a variable or a number of variables in the CBA model to assess how the changes affect the output or results.
- 7 Determine the preferred option. This will be based on a decision rule relating to the incremental appraisal metrics in step 5, as well as other qualitative factors or distributional factors not considered in the CBA.
- 8 Report on CBA results.

While CBA is a tool that supports decision-making, it is not the sole determinant of an investment decision.⁷ Some social outcomes are less tangible and are more difficult to measure using CBA; where this is the case, other tools may also be necessary to inform decision-making.⁸ Decision-makers may also have other reasons outside of CBA, such as deliverability or strategic alignment, for projects to proceed or not.

⁶ Infrastructure Australia 2018, Assessment Framework, March 2018, p. 31.

⁷ Infrastructure Australia 2019, Australian Infrastructure Audit 2019, p. 219.

⁸ Other tools used for project evaluation include cost effectiveness analysis, multi-criteria analysis and deliberative methods.

Principles for IA CBA methodology guidelines

In CIE's view, IA's methodology document should do the following:

- provide an accurate view of the steps for undertaking an unbiased and objective CBA
- provide guidance as to when a CBA should be undertaken and how interactions with IA would occur
- provide specificity so proponents know exactly what they need to do to meet IA's expectations, and
- make information easy to access for proponents.

The end outcome of a robust CBA methodology is better testing of projects' net impact on the community, more informed project selection, and better decisions being made over time.

CBA itself is a well-practiced discipline, with careful consideration required for each individual CBA. The Assessment Framework exists alongside a range of general and sector specific guidelines.⁹ IA should not need to provide guidance on how to measure every possible benefit or cost that could arise from an infrastructure project but should provide specific guidance where it does not exist elsewhere.

While the CBA methodology is an important component in the process of project development, assessment and selection, the overall Assessment Framework plays a broader role in supporting these outcomes.

⁹ Infrastructure Australia 2018, Assessment Framework, March 2018, p. 112-113.

2 Review findings

Overall the current Assessment Framework CBA methodology is fit for purpose. We believe the guidance provides an accurate view of the steps for undertaking an unbiased and objective CBA.

Areas where the CBA methodology guidelines could be improved are summarised in table 2.1, and are discussed in greater detail in the remainder of this chapter.

2.1 CBA methodology recommendations

Finding	Description	Recommended change or for consideration
Specification of base case	Consider accepting base case specification with future investment included, so long as the base case does not include investment which is either complementary to the project being evaluated or a major substitute to the project being evaluated. Conflicting jurisdiction and IA guidance around the base case specification may duplicate analysis for proponents.	For consideration
Capital cost treatment	Provide clarity around whether proponents should use P50 or P90 cost estimates, or which cost estimate is preferred by IA for the central case.	Recommended
Quantifying land use impacts	The Assessment Framework provides guidance around the measurement of land use benefits and is open to wide interpretation. More prescriptive guidance and worked examples are recommended. Post completion review guidance should be updated with respect to the data collection required to measure actual land use impacts.	Recommended
Place-based guidance	Provide specific guidance and worked examples for the evaluation of place-based projects.	Recommended
Equity and distributional impacts	Provide greater guidance around assessing equity and distributional impacts, including whether CBA is the appropriate tool for this, or remove references to distributional and equity impacts in the Assessment Framework.	Recommended
Changes to supporting guidelines	Future versions of the Assessment Framework should incorporate revisions from the supporting guidelines, such as ATAP guidelines for transport initiatives.	Recommended
Climate change and resilience	<ul style="list-style-type: none"> ▪ The Assessment Framework provides guidance around climate change risks. There is an opportunity to enhance this with guidance on designing and planning infrastructure, in response to the impacts of climate change. ▪ Provide additional guidance around measuring the resilience of infrastructure. 	Recommended
Discount rates	IA should consider whether the current discount rates in the Assessment Framework are appropriate given reductions in the cost of capital in financial markets and for regulated utilities.	For consideration

Finding	Description	Recommended change or for consideration
Uncertainty	The previous review of the Assessment Framework recommended ordering benefit and cost items by certainty. This would help stakeholders better focus their efforts around quantifying less speculative benefits.	Recommended
Delay/deferral	The Assessment Framework should require all projects to include a sensitivity test for deferring the project.	Recommended
Measurement of consumer surplus	Consider providing detailed information around measuring consumer and producer surplus, including technical guidance, graphs and equations.	For consideration

Source: CIE.

Specification of the base case

The Assessment Framework currently requires a 'do minimum' base case. However, several states' CBA guidance allow for the inclusion of committed but not funded projects in the base case specification (for example Victoria¹⁰ and Queensland¹¹). Similarly for transport projects, ATAP indicates that the base case may include initiatives elsewhere in the network where funding for those initiatives is approved, committed or expected in the absence of the proposed initiative being appraised.¹² This may be a source of frustration for proponents, as commissioning additional 'do minimum' base case modelling is costly, time consuming and can be confusing. Consultations with jurisdictions have found that overlapping jurisdictional and IA processes requires repeated tasks for proponents.

In most cases, allowing for some future investment is likely to more accurately reflect future conditions and, when there is strong demand growth, this may be required to allow realistic demand estimates within the technical limitations of transport models (the Assessment Framework currently allows proponents to include unfunded investments in the base case for this reason, following consultation with IA). This has tended to mean BCRs estimated using IA's base case are higher than using the jurisdiction base cases, although differences are small.

IA's existing guidance was intended to prevent complementary investments being included in the base case specification which artificially inflate BCRs, or major substitutes, which should be considered as an alternative option. IA could soften its stance on the base case to say that planned projects can be included only where they are not complementary to the project being evaluated or are not major substitutes for the project, and where they are included in State or Territory plans. This would also require a

¹⁰ Victorian Department of Treasury and Finance 2013, Economic Evaluation for Business Cases Technical guidelines, August 2013, p. 6; Victorian Department of Economic Development, Jobs, Transport and Resources, Generic guidance on how to undertake an economic assessment, p. 6-7, available here:

https://djpr.vic.gov.au/__data/assets/word_doc/0008/1492604/Guidance-on-how-to-undertake-economic-assessment-internet1.docx.

¹¹ Building Queensland 2016, Cost Benefit Analysis Guide, Release 2, December 2016, p. 20.

¹² ATAP 2018, T2 Cost benefit analysis, p. 8.

discussion of the impact of complementary and substitutable projects in the base case, and that IA will challenge modelling where it appears such projects have been included in the base case.

Identifying material complements or substitutes is generally straight forward. For example, including one half of a highway upgrade (that has not been committed to) in a CBA of upgrading the second half is an obvious base case issue. Where complementarity or substitutability is weak, it is more difficult to identify, but will also have a small impact on the estimated benefits. IA should work with stakeholders to have consistency across the base case specification allowed for in the Assessment Framework and state and territory CBA guidance.

Capital cost treatment

The Assessment Framework indicates that both P50 and P90 costs are acceptable in a CBA but does not indicate if IA prefers one over the other, or whether both should be reported where possible. IA should provide clarity around which cost estimate is preferred by IA for the central case to improve consistency across business case submissions.

It is noted that this is different to ATAP guidelines which suggest using the mean of costs for CBA and using the P90 value as a sensitivity test.¹³

Quantifying land use changes

The current version of the Assessment Framework includes guidance around measuring land use impacts. However, the evaluation of land use benefits is still being applied ambiguously, and there is currently little clear guidance on how much land use can be directly related to a project, including:

- how the nexus between land use changes and the project is defined, and
- how much of the land use change should be attributed to the infrastructure project.

Similarly, there is rarely consideration of other investments necessary to support the land use impacts, such as schools and hospitals. For instance, transport project CBAs which includes land use change rarely consider how land use changes impact on demand for other population supporting infrastructure. This can result in only part of the costs of realising the land use change being included in the CBA, which may overstate net benefits.

The Assessment Framework provides good guidance around the logic of including land use change, but it is not prescriptive and is open to wide interpretation. This is consistent with consultations which have found jurisdictions are seeking additional guidance on best practice methodologies to be provided in the Assessment framework. Additional guidance could be added around post completion reviews with respect to the data

¹³ ATAP 2018, T2 Cost benefit analysis, p. 61-62.

collection required to measure actual land use impacts. The methodologies for measuring the benefits and costs associated with land use change are still in development; although, we understand that ATAP is currently undertaking work looking at land use benefits. Given the lack of guidelines, providing examples and more detailed guidance may improve the quality of the land use aspects of business cases. In considering the inclusion of additional advice, IA should work closely with stakeholders to ensure guidance is consistent with that of jurisdictions and consistent with methods being developed by others.

Place-based guidance

Place-based projects are becoming more common and elements of place-based investments, such as land-use impacts, are increasingly being incorporated into projects. Place-based investments generate a range of benefits not captured by more traditional infrastructure projects, and as such there is significant variation in the range and measurement of benefits included in business cases. Like land-use benefits, there are often issues around:

- the attribution of costs and benefits to the project, and
- not including the full range of costs required for the project.

Specific guidance, beyond the land-use guidance in the current Assessment Framework and worked examples would improve the CBA guidance for these types of project.

Equity and distributional impacts

Initiative and business case reviews as part of the Assessment Framework do not currently consider the distribution of costs and benefits. However, several sections of the Assessment Framework refer to distributional and equity impacts of projects. Economic analysis tools, such as CBA are often not well suited to this type of analysis.

The guidelines should either remove references to distributional and equity impacts or should provide guidance around how these considerations should be analysed by the proponent and then assessed by IA.

Changes to supporting guidelines

The ATAP guidelines are progressively updated and new guidelines are released. For projects in the transport sector, the Assessment Framework recommends proponents draw on the ATAP guidelines in assessing initiatives and projects.

Since the current version of the Assessment Framework was published in March 2018, the following ATAP guidelines have been released:

- O2 Optimism Bias – guidance highlights a range of practices for minimising or avoiding optimism bias in cost estimation, demand forecasting, benefit identification and estimation, and the overall CBA results

- O3 Urban Amenity and Liveability – provides practical approaches and implementation guidance for inclusion of amenity and liveability impacts in CBA
- M6 Air and Sea Transport – this confirms that the principles, framework and methods set out for land transport in the Guidelines are also valid for sea and air transport
- Worked Examples, including:
 - W4 Active Travel: 4.1 Pedestrian / cycle signalised crossing or overpass
 - W1 Public Transport 1.1 Simple bus route improvement
 - W1 Public Transport 1.2 New fixed track facility

Since the March 2018 Assessment Framework, the following ATAP guidance was updated:

- M1 Public Transport – updated mode-specific guidance for public transport, includes updated parameters
- T2 Cost-Benefit Analysis – updated guidance on how the base case in a CBA should be defined and developed
- F3 Options Generation and Assessment – updated guidance clarifying risks around using multi-criteria assessment, explanation of combining monetised and non-monetised impacts and defining the role of the guidelines.
- A1 Overview (in the ‘About’ Category) – updated guidance providing context for the guidelines and discussing affordability of projects and the role of low-cost non-investment options.

Future versions of the Assessment Framework should incorporate or provide references to the updated ATAP guidance.¹⁴ Other non-transport guidelines should also be considered in future versions of the Assessment Framework.¹⁵

Climate change and resilience

The current Assessment Framework includes guidance around considering climate change risks. It has previously been noted that there is an opportunity to enhance this with guidance on designing and planning infrastructure, in response to the impacts of climate change.¹⁶

One of the benefits related to designing and planning infrastructure in response to climate change is improved resilience. The Assessment Framework, however, does not outline an

¹⁴ Note that the current Assessment Framework has some departures from the ATAP Guidelines. These include the methods to quantify and monetise vehicle operating costs, and the assumptions for vehicle occupancy rates, which may overstate benefits. Where appropriate, IA may choose to depart from new or updated ATAP guidance.

¹⁵ For example, see NSW Department of Planning, Industry and Environment 2018, Guidelines for using cost-benefit analysis to assess coastal management options; Commonwealth Department of Prime Minister and Cabinet Office of Best Practice Regulation 2016, Cost-Benefit Analysis Guidance Note.

¹⁶ Deloitte 2018, Report on the 2017 review of the Infrastructure Australia Assessment Framework 2018 Update, prepared for Infrastructure Australia, 5 March 2018, p. 13.

approach to measure this or provide examples. Additional guidance should be provided to assist proponents to understand the full scope of project benefits.

Discount rates

The Assessment Framework requires CBA results be presented using the following real social discount rates:¹⁷

- 4 per cent per annum
- 7 per cent per annum (for the central case), and
- 10 per cent per annum.

Over time the cost of capital has fallen in financial markets and for regulated businesses, which may imply that the appropriate discount rate for infrastructure evaluation has also changed. IA could reassess the appropriateness of the prescribed discount rates in the Assessment Framework. However, the current central case rate is consistent with the rate used by the Treasury and/or Finance agencies of all states and territories. A departure from this rate would require proponents to provide an additional set of economic results to comply with both jurisdiction and IA requirements.

Note that a lower social discount rate will not necessarily increase the overall level of government investment in infrastructure and may mean that other mechanisms for rationing government capital will have to be put in place.

Uncertainty

The previous review of the Assessment Framework recommended considering ordering benefit and cost items by certainty. As methodologies to measure costs and benefits develop, the certainty over the estimation of these impacts is likely to vary, for instance, land use impacts may be less certain than traditional benefit categories.¹⁸ Providing guidance around the uncertainty of benefits may help stakeholders better focus their efforts to quantify less speculative benefits.

Delay sensitivity test

The Assessment Framework provides a list of standard sensitivity tests which should be completed as a minimum in business case submissions to IA. These include testing:

- discount rates
- costs
- benefits

¹⁷ Infrastructure Australia 2018, Assessment Framework, March 2018, p. 104.

¹⁸ Deloitte 2018, Report on the 2017 review of the Infrastructure Australia Assessment Framework 2018 Update, prepared for Infrastructure Australia, 5 March 2018, p. 13.

- the economic appraisal period
- inclusion of wider economic benefits, and
- best and worst case scenarios, which are combinations of the above sensitivities.

The Assessment Framework also specifies that for projects without a strong economic case, proponents should undertake a sensitivity test to evaluate the change in the net benefits from deferring the initiative or project.

The Assessment Framework should encourage proponents to undertake sensitivity tests for deferral for all projects. This helps demonstrate the case for delivering a project in the timeframe proposed by the proponent. The timing of undertaking a project is important in the context of many projects competing for scarce funds.

Measurement of consumer surplus

Many mistakes are still made with how CBA is applied and developed with regards to the theoretical underpinnings of estimates of consumer and producer surplus. The Assessment Framework does not include detailed technical guidance on the measurement of producer and consumer surplus, including technical guidance, graphs and equations. Including technical guidance would however increase the length and complexity of the Assessment Framework.

The ATAP guidance provides this theoretical foundation for the transport sector. IA should consider providing some of this detailed information which may be particularly useful for infrastructure projects in other sectors. The value of this additional information should be balanced against its impact on the length and complexity of the guidelines.



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