

STAGE 3

Detailed Business Case Guide

Business Case Development Framework

Release 3.1



Queensland
Government

The Department of State Development and Infrastructure connects industries, businesses, communities and government (at all levels) to leverage regions' strengths to generate sustainable and enduring economic growth that supports well-planned, inclusive and resilient communities.

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Copies of this publication are available on our website at www.statedevelopment.qld.gov.au and further copies are available upon request.

CONTRIBUTORS

The following resources have been used as references in the development of this guide:

- Victorian Department of Treasury and Finance: Infrastructure investment, investment lifecycle and high-value, high-risk guidelines
- Infrastructure Australia: Assessment Framework
- NSW Treasury: The NSW Government Business Case Guidelines

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The Business Case Development Framework guides the development of business cases for infrastructure proposals. This guide considers Stage 3: Detailed Business Case as illustrated in Figure 1.

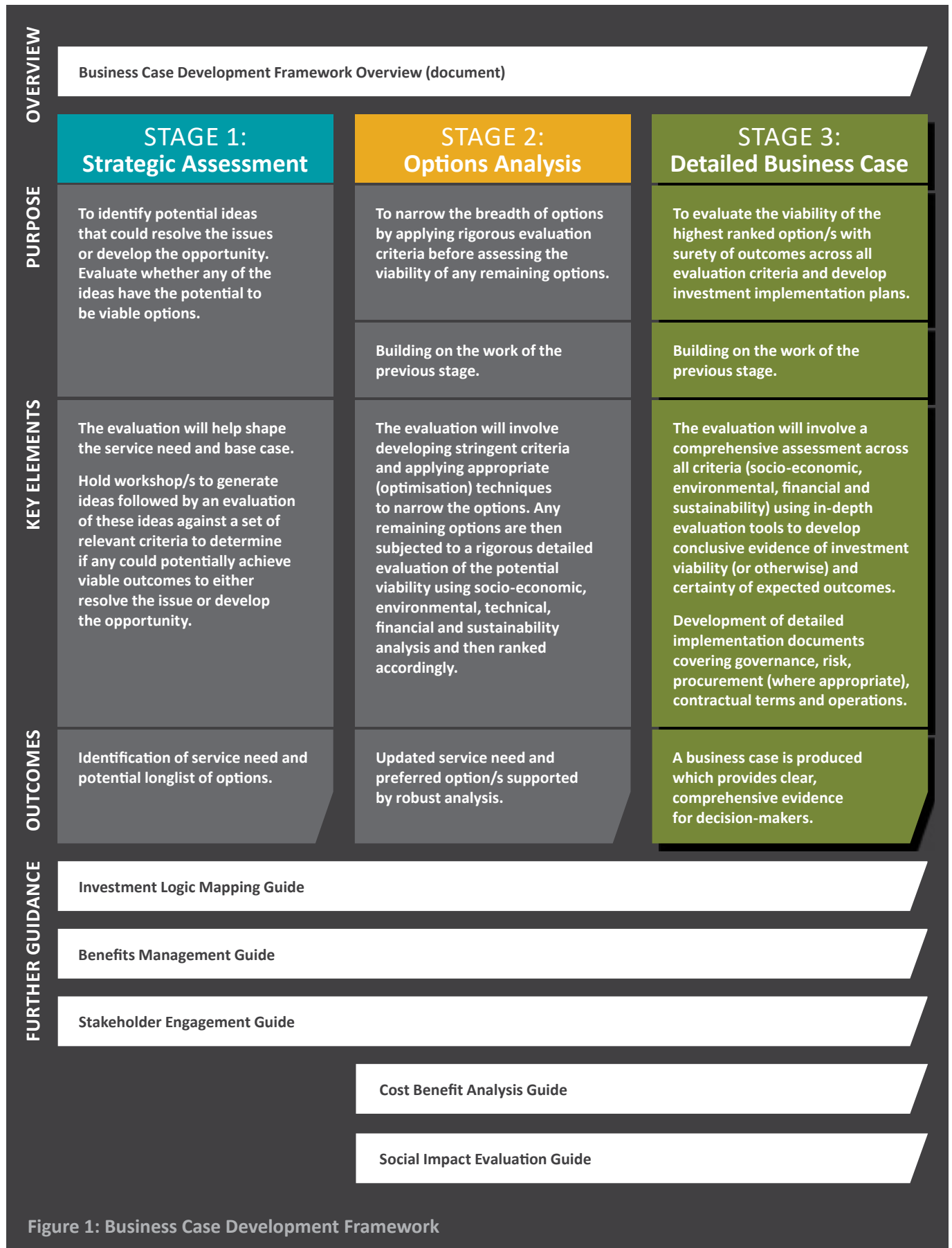


Figure 1: Business Case Development Framework

The Queensland Government applies the principles that every business case is unique, consistent yet flexible, and can adapt to the scale and complexity of a proposal as illustrated in Figure 2.



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Introduction

How to use this guide

This guide can be used as both a source book and a road map to consider the documentation and concept analysis needed for a robust and transparent Stage 3: Detailed Business Case. The structure of the guide mirrors that of the Stage 3: Detailed Business Case Template, with each section referencing business case analysis documentation and reporting considerations.

This guide, its companion template and supporting supplementary guides include a range of tools to guide your business case analysis and documentation. The contents of these documents are important—they include things to consider, assessment criteria and checklists—and will help you develop a detailed business case that supports a robust, transparent and comparable evaluation. Each proposed investment is unique so you should tailor the analysis to fit the proposal.

The following key content indicators have been included in call-out boxes to help you use this guide:



REFERENCE



TARGET/EXPECTATION



FLAG/IMPORTANT TO NOTE

There may be instances where an investment decision occurs without a complete prior assessment through the Business Case Development Framework (BCDF). The BCDF is a fit-for-purpose framework recognising that all proposed investments/circumstances are unique and the business case analysis can be tailored to fit the proposal (in some instances these tailored business cases have been referred to as Project Validation Reports, or PVRs).

Even where investment decisions may have been made in advance, a tailored business case should build on the foundations of the BCDF to consider key proposal risks (e.g. social, environment, legal and deliverability) and value-for-money community outcomes, to provide confidence to decision makers.



This guide outlines a minimum standard. It is not intended to cover all policy obligations or agency requirements.

The level of analysis required for a robust and transparent Stage 3: Detailed Business Case will vary, depending on the complexity of the proposal.

High levels of detailed analysis are expected.

Purpose

This Stage 3: Detailed Business Case Guide provides advice on the relevant considerations for developing a rigorous and robust business case analysis to fully inform investment decision-making. It aims to help you develop a quality, robust business case with a continual focus on the effective management of benefits, risks and stakeholder engagement.

Consistent with the Queensland Treasury Project Assessment Framework (PAF), the Stage 3: Detailed Business Case builds on the analysis of options undertaken in Stage 2: Options Analysis and provides a more comprehensive analysis of the preferred option/s as demonstrated in Table 1: Business case development.

This stage provides in-depth analysis on the preferred option/s (reference project/s) including social, environmental, sustainability, economic, financial and commercial considerations. In addition, the Stage 3: Detailed Business Case sets up the implementation, governance and management arrangements for the successful procurement and final delivery of the proposal.

A Stage 1: Strategic Assessment and Stage 2: Options Analysis are usually completed and approved prior to Stage 3: Detailed Business Case development, as they support the integrity and quality of the business case analysis. Where a strategic assessment and options analysis have not been completed, the Stage 3: Detailed Business Case should be adjusted to incorporate the key analyses from these stages.

Table 1: Business case development

	STAGE 1: STRATEGIC ASSESSMENT	STAGE 2: OPTIONS ANALYSIS	STAGE 3: DETAILED BUSINESS CASE
Purpose	Conceptualisation: <ul style="list-style-type: none"> » articulates the service need to be addressed » identifies intended benefits » develops longlist of options 	Options consideration: <ul style="list-style-type: none"> » reconfirms service need » analyses and assesses options » identifies preferred option/s » validates whether to invest in a Stage 3: Detailed Business Case 	Preferred option/s analysis: <ul style="list-style-type: none"> » reconfirms Stage 2: Options Analysis » confirms the economic, social, environmental and financial viability for investment decision-making
PAF stage	Strategic assessment of service requirement	Preliminary evaluation	Business case
Supporting documents	Benefits Management Guide Investment Logic Mapping Guide Stakeholder Engagement Guide	Benefits Management Guide Social Impact Evaluation Guide Cost Benefit Analysis Guide Investment Logic Mapping Guide Stakeholder Engagement Guide	Benefits Management Guide Social Impact Evaluation Guide Cost Benefit Analysis Guide Investment Logic Mapping Guide Stakeholder Engagement Guide

Structure of this guide

This guide provides an approach for developing a Stage 3: Detailed Business Case and details the work required to successfully complete a robust and transparent business case within the BCDF. It is not intended to cover all policy obligations or agency requirements.

The guide is divided into five main sections:

1. Executive summary
2. Section A: Proposal context
3. Section B: Considerations and analysis
4. Section C: Delivery
5. Conclusions and recommendations.

It has been designed to work with the Stage 3: Detailed Business Case Template document.

Approach

Detailed business case development stages

Stage 3: Detailed Business Case development does not always follow a linear process. However, for efficiency, it is recommended that you prepare a business case in several sequential development/analysis stages, where you consider and finalise key content before you progress further.

NB: Some activities will inform or refine earlier assessments (Stage 1: Strategic Assessment and Stage 2: Options Analysis) and information developed within sections of the Stage 3: Detailed Business Case phase will link to other sections, as illustrated in Table 2.

Table 2: Key development stages and activities

STAGE	ELEMENT	KEY ACTIVITIES	OUTPUTS	COMMENTS
Stage 1: Strategic Assessment	Service need identification/clarification (summary in Section A)	<ul style="list-style-type: none"> » Document the problem/opportunity and justify why a service need exists, including demand » Document the proposal background and strategic environment » Identify stakeholders » Conduct an investment logic mapping workshop with key stakeholders » Identify high-level initiatives that could respond to the service need » Identify longlist options 	<ul style="list-style-type: none"> » Investment logic map » Proposal background section » Service need section » Strategic considerations section » Initial risk register 	<ul style="list-style-type: none"> » Assessment of service need should be completed during the Stage 1: Strategic Assessment
Stage 2: Options Analysis	Options analysis (considered in Section A)	<ul style="list-style-type: none"> » Undertake options analysis and a workshop that consider options alignment with the State Infrastructure Strategy (SIS) priorities 	<ul style="list-style-type: none"> » Updated service need or proposal background section » Options analysis and identification » Updated risk register of preferred option/s 	<ul style="list-style-type: none"> » Options analysis should be completed in Stage 2: Options Analysis » The service need, strategic context and options analysis should be reviewed to ensure the proposal remains valid
	Documentation of reference project (summary in Section B)	<ul style="list-style-type: none"> » Development of technical material to document the reference project 	<ul style="list-style-type: none"> » Reference project section » ICT section if required » Initial benefits register » Updated risk register 	<ul style="list-style-type: none"> » Provides basis for the business case analysis » Reference project may be adjusted subject to the findings of the assessments

STAGE	ELEMENT	KEY ACTIVITIES	OUTPUTS	COMMENTS
Stage 3: Detailed Business Case	Detailed business case analysis (Section B)	<ul style="list-style-type: none"> » Conduct impact/benefits and risk assessment workshops incorporating effective stakeholder engagement » Re-evaluate the options analysis to confirm the reference project/s » Document and agree the base case » Undertake a detailed, evidence-based analysis of the social, economic, financial and commercial impacts and the sustainability and environmental assessments, including scenario and sensitivity analysis » Cost/risk workshop » Benefits workshop » Quality assurance including peer reviews 	<ul style="list-style-type: none"> » Document options analysis and confirm reference project (if appropriate) » Social impact, economic, public interest, legal and regulatory, financial, commercial, value creation and capture considerations, environmental and sustainability analysis » Scenario and sensitivity analysis, including foresighting and climate risk » Updated benefits and risk register 	<ul style="list-style-type: none"> » Consider the economic, social, sustainability, environmental, financial and commercial viability of the reference project/s so the decision-maker can decide whether to invest in the proposal » Include foresighting and alternate futures scenario analysis and climate risk analysis (mitigation and adaptation, supply and demand effects and opportunities) » Where a Stage 2: Options Analysis exists, the service need, strategic context and options analysis should be reviewed in the Stage 3: Detailed Business Case to ensure the proposal remains valid
	Delivery assessment (Section C)	<ul style="list-style-type: none"> » Market sounding workshop » Delivery model assessment workshop » Public sector comparator completed » Implementation planning workshop 	<ul style="list-style-type: none"> » Delivery approach » Market sounding » Implementation plan 	<ul style="list-style-type: none"> » Plan the necessary steps for the successful procurement and delivery of the project
	Finalising the Stage 3: Detailed Business Case	<ul style="list-style-type: none"> » Conduct Gateway review » Update content to reflect peer and Gateway reviews (where applicable) » Document assessment conclusions » Prepare recommendations on viability » Prepare executive summary » Prepare assurance report 	<ul style="list-style-type: none"> » Finalised Stage 3: Detailed Business Case 	<ul style="list-style-type: none"> » Prepare the executive summary after the analyses are complete » The executive summary should tell the story, be concise and able to be read independently of the business case

Detailed business case analysis

Detailed business case analysis is not a linear process. Some activities will inform or refine other assessments, and information developed within sections of the Stage 3: Detailed Business Case will link to other sections, with all analysis focused on risks and benefits (as illustrated in Figure 3: Development of the Stage 3: Detailed Business Case).

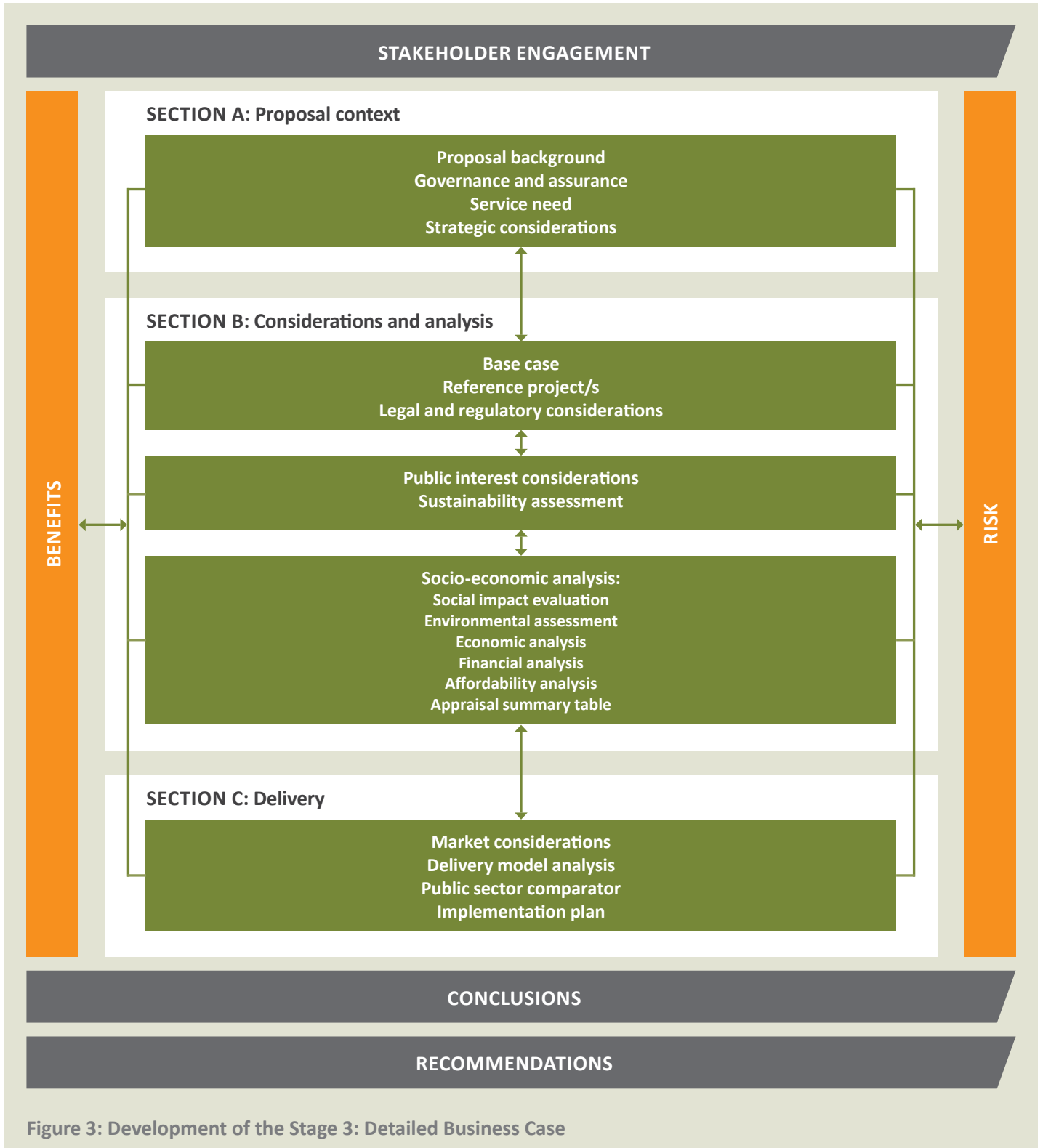


Figure 3: Development of the Stage 3: Detailed Business Case

Program versus individual project business cases

Agencies and commercial entities should consider whether to prepare and present a business case for a program, portfolio or individual project proposal. This should be an early consideration, ideally at Stage 1: Strategic Assessment. For example, a strategic program master plan or investment plan continues into a Stage 2: Options Analysis program master plan, or portfolio investment plan which considers priority options. As the proposal progresses, the need for additional actions or activities may arise at Stage 3: Detailed Business Case.

Using a whole-of-life, whole-of-system program approach to business case analysis can improve infrastructure outcomes. It allows clearer, more transparent decision-making by creating end-to-end visibility of a long-term portfolio investment.

Consider the following questions as indicators for a program or portfolio business case:

- » Are there many projects/options under a single coordinating structure or portfolio?
- » Does each project contribute to the same or similar outcomes?
- » Are the projects part of a long-term plan that require planning execution and prioritisation over an extended period e.g. beyond the forward estimates?
- » Are subsequent projects necessary to achieve full benefits and improved outcomes?
- » What is the value of the program and is approval needed?

The BCDF allows fit for purpose flexibility for program-based business cases. If a potential program has several major, complex and interdependent projects, consider a business case for the program master plan and a separate business case for each individual project. Identify and apportion the risks, costs, benefits and outcomes to each project, as well as for the combined program/portfolio. You can then develop the business case analysis at the detailed business case stage in the context of its broader program, system or portfolio. Similarly, all aspects applied to analysis at an individual proposal level can also be applied to program-level business cases.

Note on terms

For the Business Case Development Framework (BCDF), the use of the term 'proposal' refers to the suite of options identified, and subsequently refined, to one or several options.

The 'options analysis' includes the full spectrum of approaches to address the service need, problem/opportunity e.g. reform, better use, improve existing and new build.

A 'project' is an activity to create a product or service, whereas a 'proposal' is a plan to be considered for the creation of a product or service. Business cases are the development of the plan (or proposal) for investment consideration.

All proposals should consider lifecycle costs (capital and operating), benefits and risks, business and operational changes, regulatory and/or legislative changes as well as infrastructure implementation and service delivery.



Stakeholder engagement

Stakeholder engagement during Stage 3: Detailed Business Case development is critical to the quality of the business case and outcomes. Stakeholder engagement activities in a Stage 3: Detailed Business Case help support:

- » greater understanding of different stakeholders' perceptions of the service need, which can help identify appropriate initiatives or options
- » effective identification of stakeholders' expectations about potential options and the benefits, helping to assess potential demand and commercial considerations
- » better outcomes and greater accuracy in identifying public interest considerations in relation to the reference project/s and reference design
- » establishment of 'social licence' i.e. stakeholders' ongoing approval and social acceptance of a project
- » effective risk management
- » improved project outcomes when there are overlapping jurisdictions or when approvals are required from multiple departments or independent regulatory agencies (these improved project outcomes may include time, cost and user satisfaction)
- » clarification of the roles of key stakeholders involved in the delivery and commissioning of a proposal.

Overall considerations

The extent of the Stage 3: Detailed Business Case analysis should be informed by the size, scope, risk and complexity of the investment proposal (fit for purpose). This guide is designed to help you develop a quality, robust and transparent detailed analysis with a continual focus on effectively managing benefits, risk and stakeholder engagement.



Further information on effective stakeholder engagement during proposal development is included in the Stakeholder Engagement Guide.



Where your project team considers a proposal of national significance, you should engage with Infrastructure Australia. If Infrastructure Australia is likely to consider the proposal further, make sure your Stage 2: Options Analysis recommendations include two proposal options for further consideration in your Stage 3: Detailed Business Case.



The analysis for a proposal must be supported by appropriate evidence.

Robust evidence:

- » includes sound analysis, assumptions and inputs, and allows for uncertainty, which increases with time
- » uses well-developed quantitative or qualitative data collection techniques
- » adopts defensible methodologies
- » uses appropriate forecasting such as a spreadsheet or model that it is purpose built and appropriate
- » explains limitations e.g. small survey size and/or low survey response rate
- » references, where applicable, data and inputs from major statistical and research agencies such as the Australian Bureau of Statistics, the CSIRO or the Bureau of Meteorology.

Current evidence:

- » uses the most contemporary information available.

Sources of evidence:

- » use agency data collection, published performance indicators and statistical collections
- » include relevant and contemporary population growth (or decline) and demographic change data.

Executive summary

Purpose

The executive summary gives the reader a clear and concise overview of all relevant aspects of the proposal and the actions you would like from the investment decision-makers.

Considerations

Prepare the executive summary after the analyses are complete and you have prepared your conclusions and recommendations.

The executive summary should:

- » tell the story and be easy to read
- » include all key aspects of the proposal
- » clearly identify all decisions required and the associated implications
- » be concise, self-contained and able to be read independently of the business case.

Content to include

At a minimum, this section should provide a summary of all material aspects of the Stage 3: Detailed Business Case, conclusions and recommendations, as well as:

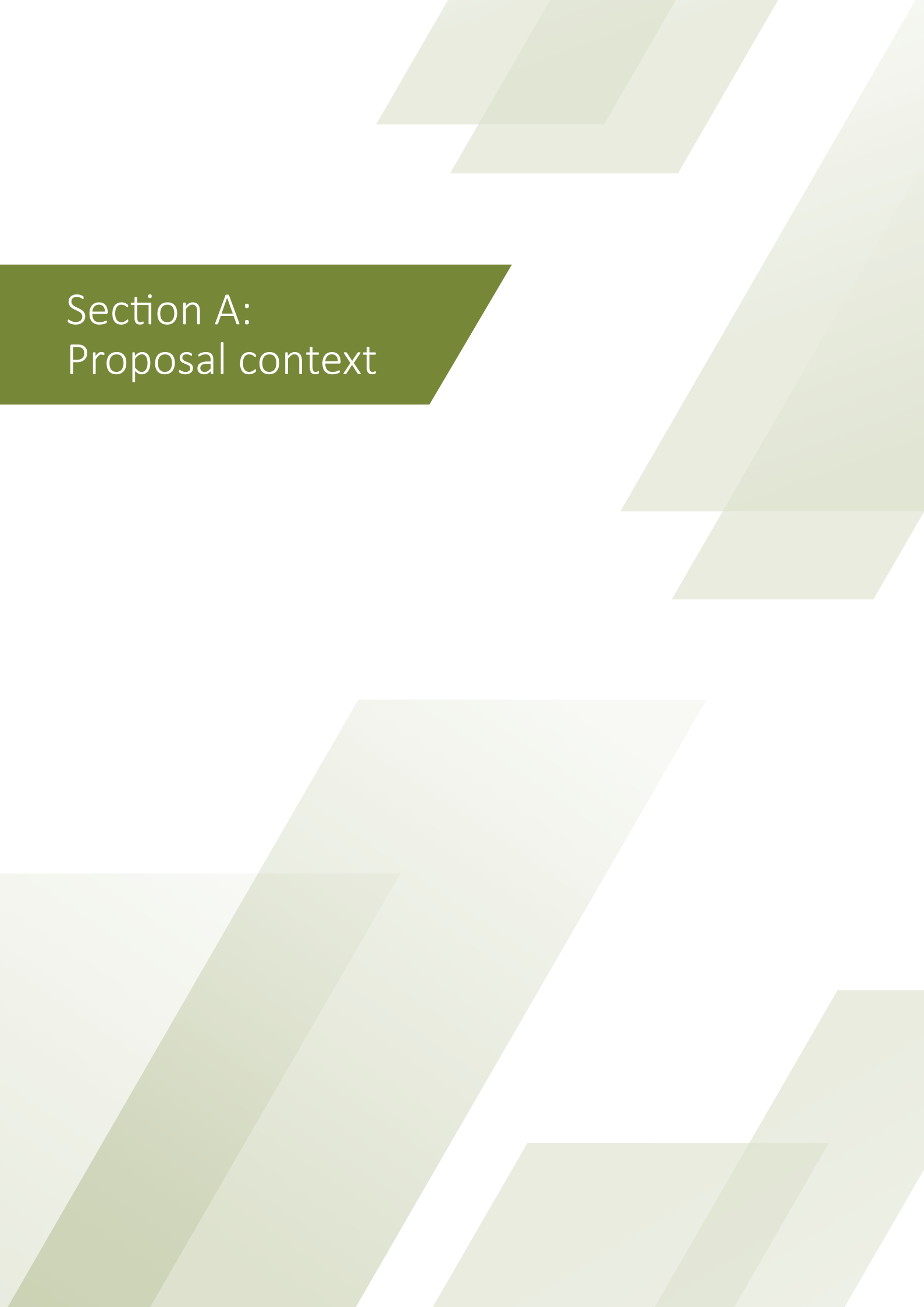
- » the service need and problem/opportunity being addressed, including the scope of the reference project/s
- » the targeted outcomes and benefits sought
- » findings of the supporting viability analysis i.e. strategic, risk, cost, economic, environmental, social, sustainability, funding¹, financial, commercial, delivery and affordability
- » recommendations for decision-makers.

Include an appraisal summary table (AST) to present critical information on the reference project. Please see Table 1 of this guide's companion template for an example AST.

Outcomes

The reader will be able to understand the key aspects of the proposal including outcomes from the analyses, conclusions and recommendations.

¹ Including consideration of value creation and capture opportunities.



Section A:
Proposal context

Purpose

Section A provides the critical strategic context information for the proposal which sets the foundation for the analyses in Sections B: Considerations and Analysis and C: Delivery. It also provides a clear outline of the proposal, its history, how it is being managed, the underlying service need and the likely outcomes if it is not supported (i.e. the ‘without project’ case or the business-as-usual). An overview of the proposal context is presented in Figure 4.

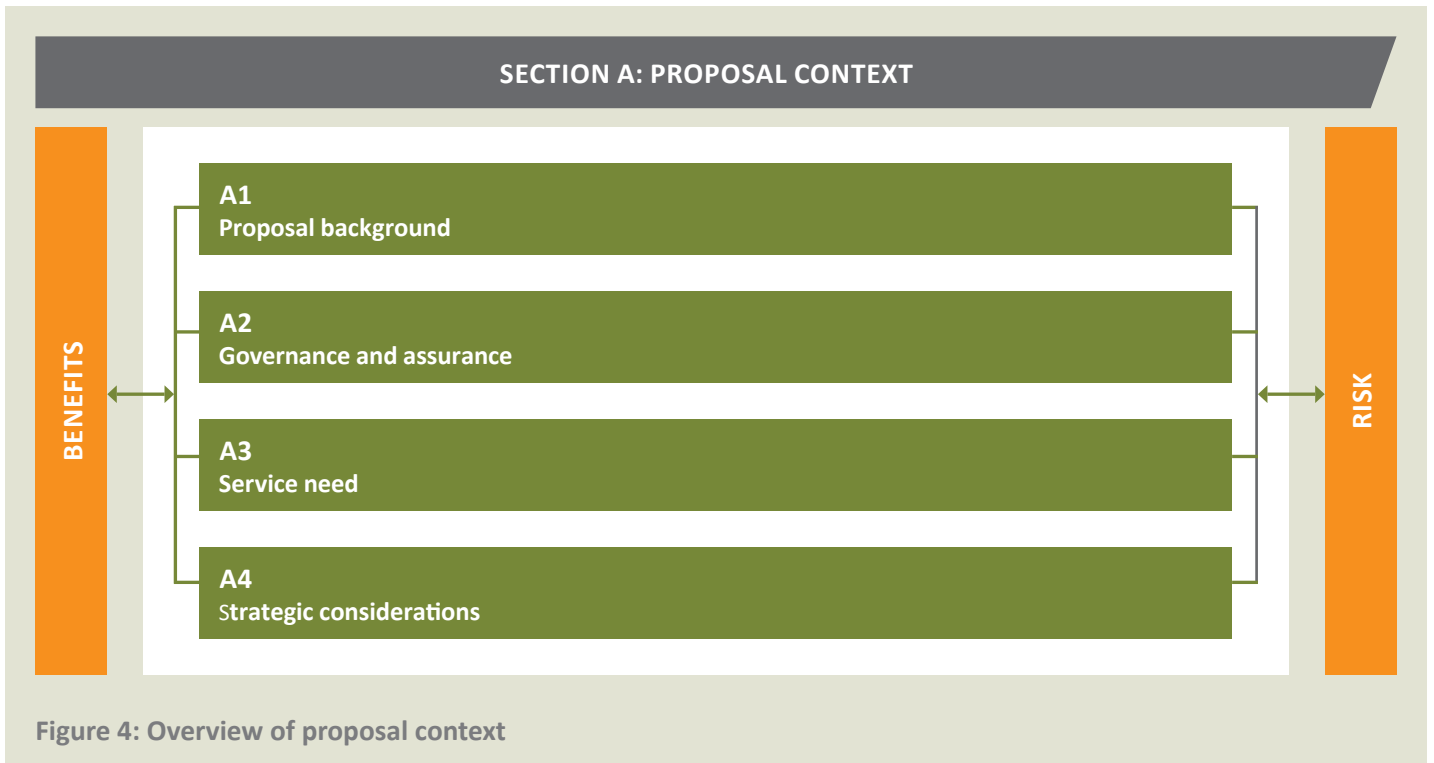


Figure 4: Overview of proposal context

A1 Proposal background

Purpose

The background provides a concise history and context for the proposal.

Considerations

- » Business cases can develop over several years. In this instance, the proposal background should note any effect of time on underlying assumptions and approaches.
- » The output and analysis from the Stage 1: Strategic Assessment and the Stage 2: Options Analysis should be reviewed including identifying any material changes since they were prepared. You should also note how they have been considered in the progression of the proposal through the options analysis. This may include:
 - › planning and policy changes and impacts e.g. strategic considerations, alignment and changes in government objectives
 - › changes to proposal objectives, scope, needs, demand, benefits and risks
 - › changes to the environment e.g. new initiatives or options, emerging stakeholders, emerging opportunities, economic changes, population demographics, social and political changes
 - › any concerns about the timeliness and validity of data used to justify the service need—and subsequent adjustments needed
 - › a review of the preferred options to ensure they are appropriate in the context of any of these changes.

Content to include

Table 3 lists the required content and considerations for this section.

Table 3: Proposal background content and considerations

CONTENT	CONSIDERATIONS
Proposal environment	<ul style="list-style-type: none"> » Location (include a map) » Investment context e.g. proposal originated during a period of drought or higher economic activity » History of the proposal » Scope and depth of all relevant investigations and studies » Related projects and proposals
History of the proposal	<ul style="list-style-type: none"> » Background to the proposal including: <ul style="list-style-type: none"> › when a problem/opportunity was selected for consideration › when the service need was first identified › an outline of any relevant planning works › any feasibility studies undertaken (previous and ongoing), noting their scope, depth and results » Summary of prior decisions » Details of any assurance processes completed to support the strategic assessment and options analysis stages
Review of Stage 2: Options Analysis	<ul style="list-style-type: none"> » Where a Stage 1: Strategic Assessment and/or Stage 2: Options Analysis has been completed prior to the Stage 3: Detailed Business Case, the service need and options analysis should be reviewed to ensure they remain valid. Changes since any previous stages may impact the following Stage 3: Detailed Business Case elements: <ul style="list-style-type: none"> › current state including the strategic context › expected future benefits, costs or risks including demand › preferred option if the analysis reveals significantly different reference project/s. In this case reconsider the Detailed Business Case and seek senior decision-maker endorsement before proceeding › stakeholders › governance arrangements

Outcomes

The background should clearly articulate the location of the proposal and why it was put forward. It should include checks against contemporary information and policy developments.

A2 Governance and assurance

Purpose

This section should consider the arrangements for developing, approving and assuring the Stage 3: Detailed Business Case.

Considerations

GOVERNANCE

- » Governance arrangements will vary depending on the complexity of the proposed option/s and the number of agencies with responsibilities in delivering the option/s.
- » Review any governance arrangements established for the previous stage to make sure they are still appropriate.

ASSURANCE

- » Assurance gives grounds to assess whether the business case analysis is transparent and robust, and gives a sound basis for decision-makers to consider the proposal.
- » Assurance should be informed by the complexity and risk of the proposal.
- » The nature and extent of assurance activities should be informed by:
 - › **The nature and risk of the proposal:** Assess the overall risk and potential financial exposure associated with the proposal. Risks (including financial, social and environmental) that are rated as high for completing the business case analysis should inform the specific assurance activities.
 - › **The experience and maturity of the agency or department:** The extent of assurance activities you need will also depend on your agency's experience and maturity in previous infrastructure assessments and/or in developing business cases.

Assurance activities are designed to improve the efficiency and effectiveness of a proposal and the quality of its outputs.



Documenting the governance and assurance arrangements for the business case analysis assures the decision-makers that the appropriate people, expertise and agencies have participated and that you have undertaken robust and evidence-based business case analysis.



Before completing the Stage 3: Detailed Business Case, you should undertake a Gate 2 Assurance Review (if considered appropriate). The results of this review should be incorporated into the analysis and should be documented and noted in this section.

Gateway reviews are mandatory for ICT-related initiatives. The Queensland Government Chief Information Office (QGCIO) can give you further information on the requirements for ICT-related gate reviews.

- » Principles to underpin establishing assurance activities include:
 - › **Complete:** documents contain all the information necessary for an investment decision.
 - › **Reliable and reasonable:** the quality of the information is appropriate to address specific requirements of the option and can be relied on because it has been prepared with appropriate expertise and rigour.
 - › **Comparable:** the information is presented in a way that allows 'like-for-like' comparison with other business case analysis processes.
 - › **Transparent:** the information has been prepared without bias and with all risks, implications and mitigations clearly documented.
 - › **Owner-engaged:** throughout the development of the business case analysis, the Senior Responsible Owner (SRO) was engaged and is ultimately accountable for justifying the service needs and the benefits identified in the business case analysis.

Content to include

Table 4 lists the required content and considerations for this section.

Table 4: Governance and assurance content and considerations

CONTENT	CONSIDERATIONS
Proposal development governance	<p>The governance arrangements should consider:</p> <ul style="list-style-type: none"> » the proposal owner » the project team, including roles and responsibilities for elements of the work » the project steering committee, including central agency and, if appropriate, DSDILGP representation » a project control group » working groups » overall approach to developing the proposal. <p>When planning who should be involved, consider:</p> <ul style="list-style-type: none"> » The project steering committee should include representation of agencies/individuals who can or may influence the outcomes/progress of the proposal in this and future stages. » The project control and/or working groups should include representatives who have specific knowledge and expertise to guide the development of the analysis, including potential end-users. » Governance structures for the development and approval of the proposal should align with existing agency structures where possible.
Stage 3: Detailed Business Case approval governance	Approval governance should include agency approval processes, Cabinet Budget Review Committee and, if appropriate, Cabinet.
Assurance mechanisms	<p>Assurance mechanisms may include:</p> <ul style="list-style-type: none"> » specialist reviewers for both the approach and content of the document » peer and technical review to ensure the analysis is reliable, accurate and effectively supports a robust and transparent cost, risk, commercial and economic assessment. The review should include: <ul style="list-style-type: none"> › the methodology and approach › data › supporting assumptions › modelling analysis. » executive review » project health and project governance reviews » focused technical reviews e.g. in response to an identified or perceived issue » Gateway reviews: the use of a Gate 2 Review is a key consideration for a Stage 3: Detailed Business Case.
Assurance plan	Develop and seek approval for an assurance plan at the commencement of business case development and include the final as an appendix to the Stage 3: Detailed Business Case.

Outcomes

Governance and assurance should clearly articulate the structures and arrangements in place to manage and oversee the development of the proposal. They should also communicate the approval processes and structures.

A3 Service need

Purpose

This section should clearly explain the service need (problem and/or opportunity) you are addressing and the demand for the proposal. The service need analysis is a critical input into the base case and the key analyses in Sections B and C.

Considerations

- » The service need may result from a problem/opportunity which should have been identified by the earlier stage analysis.
- » When describing the service need, consider the cause, who/what (i.e. stakeholders) are affected and how. Include evidence of the cause and impact of the problem/opportunity to support the identified service need. Evidence should be robust and current, and documented in the business case, where appropriate. Describe the timing of the problem/opportunity—is it immediate, interim, ongoing or escalating?
- » An investment logic mapping (ILM) workshop involving relevant stakeholders will help craft a shared understanding of the service need. Refer to the Investment Logic Mapping (ILM) Guide for additional guidance.
- » Consider whether to continue with an initiative if the proposal has been developed in response to a perceived current problem or future opportunity (i.e. 'nice to have') but cannot be supported by robust evidence.

A focus on realising benefits (social, economic, environmental, sustainability and financial) ensures the investment proposal will achieve outcomes valued by stakeholders and contribute to strategic imperatives.



The service need analysis should be sufficiently detailed to convey to decision-makers the underlying reason for the proposal.

The level of detailed demand analysis you undertake should give a high degree of confidence that the analysis is contemporary, robust and transparent, while also clearly documenting any limitations and constraints.

- » Where a Stage 1: Strategic Assessment and/or Stage 2: Options Analysis have been completed prior to the Stage 3: Detailed Business Case, these should be reviewed to ensure they remain valid. Changes since any previous stages may impact the following Stage 3: Detailed Business Case elements:
 - › current state, including the strategic context
 - › expected future benefits, costs or risks, including demand
 - › preferred option if the analysis reveals significantly different reference project/s. In this case reconsider the Detailed Business Case and seek senior decision-maker endorsement before proceeding
 - › stakeholders
 - › governance arrangements.
- » Considerations when reviewing and reassessing the options analysis:
 - › whether any options need deleting, modifying or amending
 - › the full range of impacts, both positive and negative
 - › potential to address the service need and achieve the range and quantum of benefits sought
 - › the impact of any time lag or delay between project phases
 - › the need to repeat the options analysis performed in the Stage 2: Options Analysis to select a reference project/s.



A review of the service need should focus on:

Effectiveness

What impact does the problem/opportunity have on the effectiveness of service delivery? Provide:

- » details of the effects of the problem/opportunity economically, socially and environmentally (include evidence)
- » demand analysis to help capture areas of need and any potential substitutions and their effects

Regulatory

Is the service need a statutory/regulatory requirement? Provide:

- » details of the relevant statutory, regulatory or organisational policy requirements and how they are currently being met or failing to be met
- » details of changes to statutory, regulatory or policy settings that have created an effect on existing services

Service failure

Is the service no longer fit for purpose? Provide:

- » details of the extent of service failure and the effect on customers/users

Extent

What are the broader links of the service need and the associated problem/opportunity? Provide:

- » the geographic and demographic reach of the service need, including relevant maps and supporting graphics
- » details of how the service need aligns with relevant strategic initiatives, regional and local plans, and the State Infrastructure Strategy
- » any matters of national significance; consider the involvement of Infrastructure Australia
- » a summary of related projects and their potential impact on the benefits targeted by the proposal, noting any potential opportunities for integration and coordination

Improved efficiency and reduced costs

Is the service need related to existing efficiency issues? Provide:

- » details and evidence of how service delivery is affected by underperformance or lack of infrastructure
- » quantified details of the impact of potential improvements, if the service need is met

Timing considerations

Why does government need to act now? Provide:

- » details of any urgency in responding to the problem or seizing the opportunity
- » the timeframe for any potential impacts

Where a Stage 1: Strategic Assessment or Stage 2: Options Analysis has not been completed prior to a Stage 3: Detailed Business Case, consider completing the critical foundation analysis required by the earlier stages before proceeding.

Content to include

This section should include content as outlined in Table 5 below.

Table 5: Service need content and considerations

CONTENT	CONSIDERATIONS
Approach	<ul style="list-style-type: none"> » Document the approach used to identify the service need. » Include details of any investment logic mapping exercise or research completed.
Service need statement	<p>A service need statement is made of two main elements:</p> <ol style="list-style-type: none"> 1. the problem/opportunity and how it will evolve over time 2. why the problem/opportunity needs to be addressed now. <p>The service need and supporting analysis should capture:</p> <ul style="list-style-type: none"> » the ‘root causes’ of the problem and effects, noting how they may change over time (worsen or improve) » whether changes in demand (anticipated or existing) will affect the problem/opportunity (provide evidence) » an outline of the rationale for the service need to be addressed » risk and uncertainty, including climate change—refer Section B2: Base case » assumptions used for any projections or modelling » detail of the timing and extent of the problem/opportunity.
Stakeholders	<p>The detailed business case analysis is focused on risks and benefits. To understand the project/s impacts (benefits and risks to be mitigated), it is important to know who will, or may, be impacted.</p> <ul style="list-style-type: none"> » Stakeholders may include those with an actual or perceived interest e.g. environmental groups. » Stakeholders who can influence the design or delivery of the proposal should be considered for all aspects of the Section B analysis. » Stakeholder assessment should include: <ul style="list-style-type: none"> › who they are › level of interest › level of impact › when to engage › information to be shared › needs and expectations, including mandatory needs e.g. accessibility requirements. <p>The service need section summarises who is impacted by the problem/opportunity including individuals and groups either during construction or when the project is operational.</p> <p>It may not always be appropriate to consult with external stakeholders during proposal development. If this is the case, representatives of stakeholder groups or staff who understand their perspectives/needs should be consulted.</p> <p>The stakeholder analysis for the service need supports the development of the following content:</p> <ul style="list-style-type: none"> » reference design and, through this, cost and risks » social impact evaluation » economic analysis » public interest considerations » sustainability assessment » environmental assessment.

CONTENT	CONSIDERATIONS
Current state	<p>The current state describes the conditions surrounding the service need. It provides a baseline from which the reader can understand what changes will occur if the project goes ahead.</p> <p>Documentation may include:</p> <ul style="list-style-type: none"> » the stakeholders’ experiences » the physical condition of the infrastructure » performance issues » potential future state » whole-of-life, whole-of-system implications. <p>This section may include a discussion on the need for government intervention, implication of time delays, policy changes, changes in the project environment and any concerns with the relevancy of data used in previous analyses i.e. Stage 1: Strategic Assessment or Stage 2: Options Analysis.</p> <p>The current state analysis supports the development of the following content:</p> <ul style="list-style-type: none"> » base case » reference design » social impact evaluation » economic analysis » public interest considerations » sustainability assessment » environmental assessment. <p>There should be a strong relationship between the current state and the base case (Section B2: Base case). The business-as-usual (BAU) base case incorporates the service need analysis. It includes further refined assessment to form the critical reference point for the social, economic, benefits, financial and commercial analyses.</p>
Targeted benefits	<ul style="list-style-type: none"> » Targeted benefits consider the intended benefits when responding to the service need, problem/opportunity. <ul style="list-style-type: none"> › Benefits should be expressed with respect to their impact on proposed beneficiaries. › Benefits should be specific and relevant to the detailed business case. » At the commencement of the Detailed Business Case, consider using an impact/benefits workshop incorporating key stakeholder input to establish an initial benefit register to help frame the Section B analysis.
Implications of not proceeding	<p>Describe what is likely to happen if the proposal does not go ahead.</p> <ul style="list-style-type: none"> » Implications might be social, economic, financial, environmental and sustainability focused as well as related to the performance of the asset/service. Include any potential equity and public interest concerns. » Include the implications of delaying a response e.g. capacity limits will be reached, failure to meet government or legislative requirements, significant reduction in the level of service etc. » Frame the implications of not proceeding in terms of the impacts on stakeholders.

CONTENT	CONSIDERATIONS
Options	<p>This section provides the decision-maker with confidence that the analysis used in the shortlisting of options was robust and transparent.</p> <ul style="list-style-type: none"> » Explain your approach to options selection. Include options filtering and provide details of how you have identified the preferred option/s from the Stage 2: Options Analysis. Include whether this was informed by a comprehensive re-evaluation and/or review in this Stage 3: Detailed Business Case. » Summarise the options considered. Include details of: <ul style="list-style-type: none"> › all options considered, describing their impacts (both positive and negative) and how likely they are to respond to the service need and achieve the benefits sought › any changes to the options and the justification for the change. Any changes since the Stage 2: Options Assessment should be clearly identified and explained › additional options or comments about discarded options › the results of the reassessment of options. » Provide details on how the preferred option (reference project) was chosen. Further analysis may not be required, only the reason why the preferred option/s was selected over others. » Document any assumptions underpinning the assessment of the shortlisted options including the cost benefit analysis (CBA), social impact evaluation (SIE) and financial analysis that contributed to the result. A copy of the summary table from the Stage 2: Options Analysis may be included.

Outcomes

The reader should understand the current state, benefits sought, implications of not proceeding and how the preferred option/s was selected.

A4 Strategic considerations

Purpose

This section details how the reference project/s aligns with local, regional, state and federal plans or strategies and/or may be of national significance.

Considerations

Strategic considerations should include how the reference project/s will fit with, contribute to or align with:

- » the strategic objectives of the policy agency and commercial entity/shareholder agency, including the Queensland Government's aims for the community
- » relevant national objectives and programs (where appropriate)
- » the fiscal and commercial environment and industry context
- » regional, local, state and national plans
- » sector objectives
- » system objectives e.g. roads and ports support economic and regional development.

While the relevant strategic considerations section in the Stage 2: Options Analysis will provide a starting basis for this section, they should be updated, further developed and refined to ensure impacts are adequately considered in the Stage 3: Detailed Business Case.



Adjust the stakeholder list and benefits register based on the results of this review.

Content to include

This section should include content as outlined in Table 6 below.

Table 6: Strategic considerations content and considerations

CONTENT	CONSIDERATIONS
Strategic alignment	<p>How will the reference project/s fit with, or contribute to, the strategic objectives of the agency, commercial entity, shareholder agency, government, its asset management plans and the relevant national objectives and programs (where appropriate)?</p> <p>In describing your reference project/s strategic alignment, include:</p> <ul style="list-style-type: none">» an explanation of how the project will align (or not) and its potential contribution to each relevant strategy, program or plan» consideration of the fiscal environment and industry context.
Policy issues	<p>Assessing policy considerations should include:</p> <ul style="list-style-type: none">» a description of the impact, if any, of the reference project/s on existing policies and standards (or vice versa) within government, agencies and relevant stakeholder environments» a description of any limitations imposed by the policies and standards and the known effect on the reference project/s such as any impact to the benefits» impacts and limitations characterised as either advantages or disadvantages.

Outcomes

Strategic considerations ensure key stakeholders are aware of how the proposal supports local, regional, state and federal policies, plans or strategies and whether it may be of national significance.

Health check A

#	HAVE YOU COMPLETED THE FOLLOWING?	SECTION	COMPLETED
1	Provided a succinct proposal background, including relevant history, to set the scene for the business case	A1	<input type="checkbox"/>
2	Documented an accurate representation of the proposed governance and quality assurance structure for the business case analysis	A2	<input type="checkbox"/>
3	Outlined the proposal's current state enabling decision-makers to understand the basis for the service need	A3	<input type="checkbox"/>
4	Documented the service need, the reason and supporting analysis behind the need for the proposal, and the range of options considered in responding to the problem/opportunity	A3	<input type="checkbox"/>
5	Documented the proposal's alignment with strategic objectives and contemporary policy developments, legislation, regulation and standards	A4	<input type="checkbox"/>



Section B: Considerations and analysis

Purpose

Section B outlines the considerations and analysis needed to support the evaluation of the reference project/s as outlined in Figure 5 below.

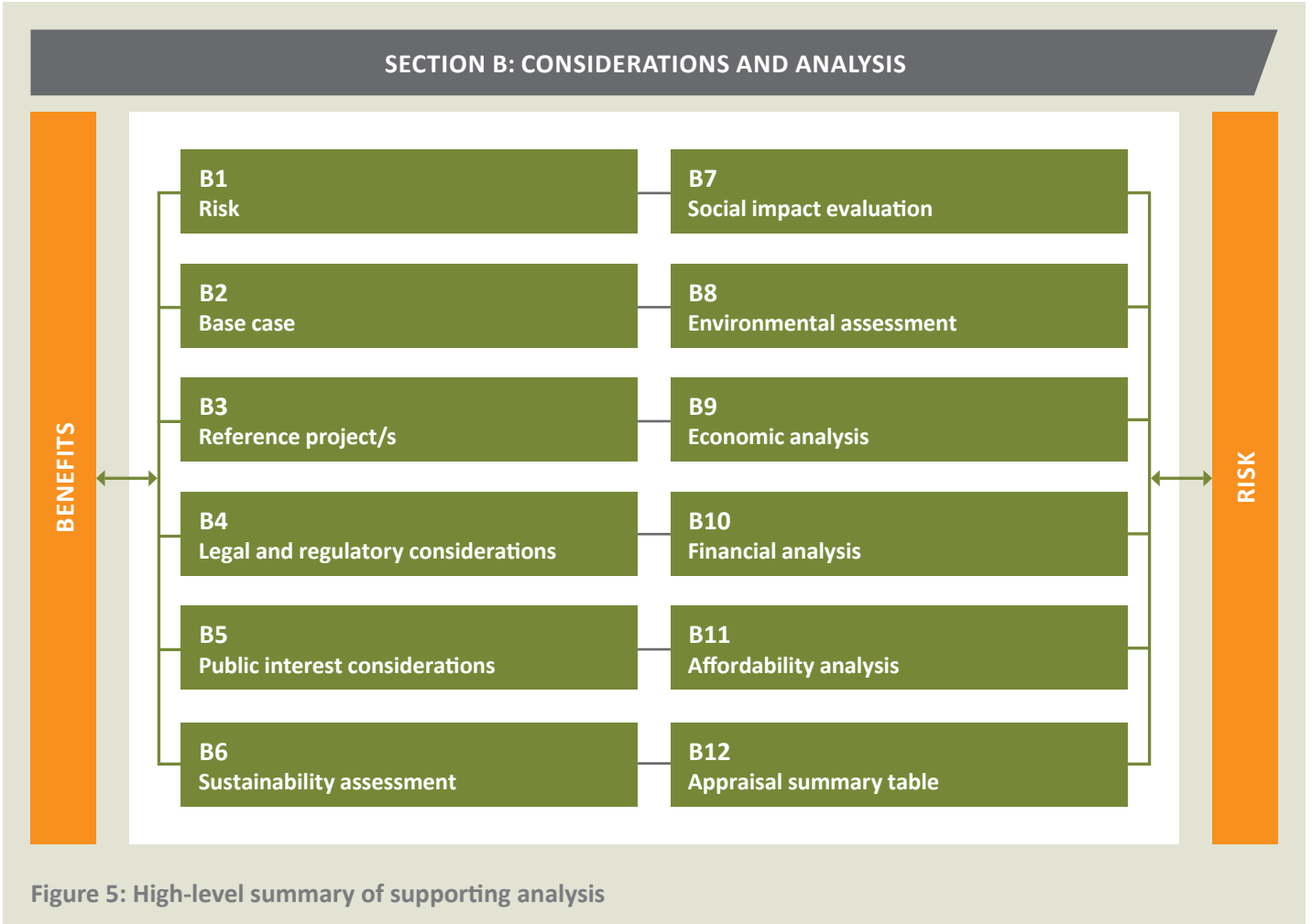


Figure 5: High-level summary of supporting analysis

Considerations

- » Before commencing Section B analysis, consider undertaking an impact analysis (benefits) workshop with key stakeholders to inform all elements of Section B analysis and the benefits register.

This will help ensure that the key benefits sought are contemporary and owned by key stakeholders (e.g. confirm number of hospital beds) to confirm the reference project/s and before commencing the social, financial, environment and economic analysis.

- » Sections B1: Risk, B2: Base case, B3: Reference project/s and B4: Legal and regulatory considerations set the foundation for further analysis and should be substantially drafted and agreed before commencing the remaining Section B analysis (these sections also continue to be refined as the analysis continues).

- » Sections B5: Public interest considerations, B6: Sustainability assessment and B7: Social impact evaluation (SIE) set the foundation for subsequent analysis in Section B and should also be substantially drafted before more detailed analysis, particularly economic, environmental, financial and commercial.
- » The SIE and subsequent economic, environmental and financial analyses do not have a linear relationship. All analyses contribute to each other as illustrated in Figure 5.
- » For example, the SIE can be updated with consideration for the economic and financial analyses (these sections also continue to be refined as the analysis continues).

The methodology for the SIE, economic, financial and affordability analysis should be drafted to ensure they are in sync with each other. They should be agreed upon prior to any detailed analysis.

B1 Risk

Purpose

This section analyses and considers the overall risks (economic, social, sustainability, environmental, financial and commercial) associated with the proposal. It is a key focus for all analysis in Section B.

Considerations

Effective risk management requires a holistic approach focusing on strategic, service, system, political, environment, economic and legal risks. It should not focus on just one element i.e. project (time and cost) or financial risk.

Risk-management activities completed during proposal development include:

- » identifying project/s risks to ensure the reference project/s is designed to effectively address them i.e. risks associated with changes in the proposal background, service need, stakeholders or in a strategic and political context
- » identifying methodological risks in proposal development i.e. the processes, assumptions and practices underpinning the assessments (governance, legal, regulatory, social, economic, sustainability, environmental, technical e.g. geotechnical, engineering design, cost, financial and commercial) and data reliability, accuracy and currency
- » identifying process risks i.e. stakeholder engagement activities and timing to ensure the process for developing the business case maximises its outcomes and helps build or maintain social licence to operate
- » identifying potential project risks as listed above, as well as timing, delivery, funding, development and governance.

Risk consideration should be measured in all aspects of Section B analysis. The risk register originating from the Stage 2: Options Analysis should be continually updated to identify risks or accounted for in Stage 3: Detailed Business Case development.

In general, the risk analysis should consider the following key elements:

- » description (accurately define the risk)
- » impact risk assessment (likelihood, consequence, materiality and risk rating)
- » mitigation and controls (including assessing adequacy of control)
- » residual risk rating (post mitigation).

Risk can be negative and positive (positive risk assessment considers protecting/enhancing risk especially in the SIE).



Risk should be addressed throughout the proposal development process. It must be effectively managed to ensure the design is appropriately adjusted to respond.



Refer to your agency's risk management policy and the Australian Standard (AS NZS ISO 31000:2009 Risk Management—Principles and Guidelines) for guidance on conducting a risk assessment. The Project Assessment Framework (PAF) and National PPP Policy also provide guidance on risk assessments.

Content to include

This section should include content as outlined in Table 7 below.

Table 7: Content and considerations

CONTENT	CONSIDERATIONS
Overall approach to risk	What activities were undertaken to identify risk such as a robust risk workshop incorporating input from participants with key expertise?
Risk framework	Note the risk assessment framework including the criteria for consequences, likelihood and control effectiveness. Note whether it aligns to the project owner's risk framework and if not, why?
Outcomes	Make note of key risks and any adjustments made to the project/s. Include the full risk register as an appendix to the proposal. Some key risks may also feature in the conclusions, recommendations and implementation plan.

Outcomes

The risks associated with the project should be clearly articulated including strategic, political and system integration risks, and those associated with the proposal development. Be clear about how risk ratings were calculated and how negative risks will be managed.

B2 Base case

Purpose

The base case sets the critical baseline against which the social, economic and financial/commercial assessments are analysed.

Considerations

The development and analysis of a robust, transparent and evidence-based base case sets the frame of reference for the social, economic, environment and financial analysis for the investment proposal. In all cases the development of a robust base case requires careful consideration. The base case should represent a realistic, practicable and workable assessment of the business-as-usual (BAU) state.

The BAU base case should be framed around consideration of a whole-of-life, whole-of-system, whole-of-state perspective. Where appropriate, the proposal should be considered within the context of an existing program (systems perspective).

BAU forecasting should be a reasonable approximation of what is anticipated in an uncertain future. Things to consider when assessing uncertainty include:

- » That uncertainty (technological change, climate change, demographics, globalisation etc.) usually increases with time, resulting in declining confidence in forecasts and projections. These factors need to be integral to all aspects of your base case (and options) including:
 - › setting the evaluation period and terminal values
 - › benefit flows and sensitivity analysis
 - › scenario analysis.
- » The base case forecast/projections should not continue in straight-line perpetuity if the service levels or factors are unrealistic. This will determine the investment and evaluation period used for business case analysis.
- » Consider foresighting/alternate futures—including scenario and/or sensitivity analysis testing for options analysis and reference project/s design—to confirm resilience and sustainability in infrastructure investment (options and design).
- » Consider future trends including, for example, as identified in:
 - › Infrastructure Australia’s Australian Infrastructure Audit (2019): quality of life and equity
 - › cost of living and incomes
 - › community preferences and expectations
 - › economy and productivity
 - › population and participation
 - › technology and data
 - › environment and resilience.



Within an investment proposal, the projected performance is compared with what is expected into the future (base case). The base case describes the expected performance and situation, and may include an existing asset, program or policy change.

The base case documents a forward-looking baseline against which the economic and financial/commercial assessments of the investment proposal are completed.

- » Include, where appropriate, active consideration of climate change risks (adaptation and mitigation, supply and demand impacts).

In all these considerations consider qualitative real options analysis.

These considerations feed into the analysis and documentation of the following, in some cases interdependent, variables:

- » expected demand for, or use of, relevant existing infrastructure services
- » cost—Capital Expenditure (CAPEX), Operational Expenditure (OPEX), recurring CAPEX, consideration of rapidly declining service quality or significantly increasing maintenance costs
- » social trends e.g. demographic trends
- » technological trends e.g. the emergence of electric and automated vehicles
- » climate change impacts.

Practical examples of base case considerations include:

- » **Keep safe and keep operating:** minimum expenditure to keep the asset/infrastructure operationally safe. For example, in the absence of the project, the state will continue to fund the operational cost of basic services like education, health, infrastructure maintenance, prisons etc. into the foreseeable future (beyond the forward estimates period).

- » **Make safe and stop operating:** minimum expenditure to prevent any wider endangerment but without continuing to operate an asset in its existing fashion or provide the current service. For example, asset classes subject to changing regulatory regimes or climatic variability that make them non-conforming to continue operating into the future without additional safety-related investment. Examples include bridge and dam infrastructure.
- » **Reasonable changes:** that could be ‘reasonably expected’ to happen given statutory obligations and/or professional standards. This could include modest spending to improve the effectiveness of existing assets and to maintain social licence to operate. Within these constraints, the government could defer investment in infrastructure capital expenditure until it has considered other non-infrastructure solutions. In such a case, the evaluation period may need to be truncated to the point in time where the investment becomes necessary.
 - › Importantly, in this scenario, the state may eventually need to invest in an infrastructure solution if the level of service in the business-as-usual (BAU) base case becomes unsustainable because for instance:
 - public expectations change causing significant political and social licence risks
 - service quality is unsustainable
 - legal or regulatory requirements change.
 - › In some circumstances, the BAU may represent a do minimum, CAPEX spend where the level of service is sustainable from a social licence, legal or regulatory perspective. This may be linked to exploring other non-infrastructure solutions and/or a short evaluation period e.g. 7 to 10 years.
- › In some circumstances, the proposal may address some elements of the BAU, for example, it may fund some OPEX in the BAU. In this case, the option will need to be considered in the financial and economic analysis.
- › In some circumstances, such as those requiring the maintenance of absolute service levels, the state may not have any non-infrastructure deferral options to maintain BAU to meet reasonable community expectations, legal or regulatory requirements (which may be in the very short term or immediate). In this case, it may be possible that the BAU base case is in effect the option to ensure the most cost-effective solution, using a cost effectiveness assessment (CEA), while also assessing how well the proposal meets the business-as-usual service standards.
- » It is essential to account for current and future asset performance, potential reduction in service level and associated costs.
- » Elements in common across base cases:
 - › full lifecycle benefits and costs including any actions which will be required in future to ensure the asset can operate at the relevant service levels
 - › should be consistent with most of the key assumptions in the project case/s except, for example, reference project funding
 - › costs and disbenefits of the problem should, to the extent possible, be monetised for the cost benefit analysis (CBA) and the financial and commercial analyses.

The base case should be well developed and articulated at the Stage 1: Strategic Assessment and Stage 2: Options Analysis stages.

- » At Stage 3: Detailed Business Case stage, the BAU base case should be reconfirmed to align it to contemporary developments e.g. environmental or operating changes (legal, regulatory or policy). The base case should also be refined to fully reflect expectations including projected demand profiles.
- » Significant inputs for determining a base case will originate from the service need assessment (nature and composition of demand) and benefits analysis, and from prior stage development (strategic assessment and options analysis). It is appropriate to consult cost accountants, reporting units, strategic asset managers, asset performance teams and portfolio analytical areas within the proponent organisation to identify and describe the base case.
- » Use the most contemporary state and federal government statistical forecasts and projections (social and economic parameters including demographics, population growth etc.).
- » Use the most contemporary service delivery and asset performance forecasts/projections from the proposal owner agency, statutory authority or commercial entity.



Content to include

This section should include content as outlined in Table 8 below.

Table 8: Base case content and considerations

CONTENT	CONSIDERATIONS
Approach	The approach to defining the base case including any limitations and assumptions.
Base case	<p>Base cases should use the evidence base and information found in your research to identify:</p> <ul style="list-style-type: none"> » current and future expected performance » level of service provisioning » regulatory requirements » expected service levels » expected degradation of asset » expected expenditures. <p>Include the following content in the base case section:</p> <ul style="list-style-type: none"> » a full description of current performance » a full description of future expected performance » interim solutions to be delivered in the absence of the project case including their costing and impact on performance » any reduction in the delivery of that performance (or level of service) » complete and detailed costings of maintaining the BAU approach. <p>Developing a base case is closely linked to the basis for setting the evaluation period, terminal value and the assessment of the net financial and economic benefit flows. This means you should agree key factors before starting to develop your proposal. These include:</p> <ul style="list-style-type: none"> » service need » base case » evaluation period » methodology for the social, financial and economic analyses, including approach to cost benefit analysis (CBA) and terminal value. <p>Review regulatory, legislation or policy changes, which may in some cases be embedded in the options design. These considerations should have been fully explored in the earlier stage analysis.</p>
Base case statement	<p>All base cases:</p> <ul style="list-style-type: none"> » include full lifecycle benefits and costs, including any actions that will be needed in future to ensure service levels continue to operate » are consistent with the assumptions in the proposal case/s » have costs and disbenefits of the problem expressed in money terms for the CBA and the financial analysis, as far as possible.

CONTENT	CONSIDERATIONS
Link to other analysis and documentation	<p>Significant inputs for determining a base case will originate from the service need assessment (nature and composition of demand) and benefits analysis, and from prior stage development (strategic assessment and options analysis).</p> <p>The economics (base case), social impact evaluation (SIE) and financial analysis (baseline) each need to clearly and transparently articulate the approach, analysis, and methodology used in the base case determination.</p> <p>All three sections should be checked for consistency of application. The SIE and CBA guides provide additional guidance for base case analysis and documentation requirements.</p>

Outcomes

A well-articulated base case:

- » provides information on the situation in the absence of the proposed investment, program modification, policy change or project being approved
- » documents how the base case has been progressed and refined from earlier stage analysis (Stage 1: Strategic Assessment and Stage 2: Options Analysis)
- » provides a full description of the expected performance of the existing asset, program or policy setting
- » includes current operational practice and other related assets, for example the operation of multiple dam assets in tandem operating regimes
- » highlights the expected ongoing effects that could reasonably be expected or are forecast
- » describes the implications of not undertaking any additional change to the existing asset, program or policy setting
- » provides a basis for comparison with the additional performance or changes highlighted by the investment profile set out in the reference project/s.

B3 Reference project/s

Purpose

This section provides detailed information on the reference design which is the key point for comparison against the base case for the subsequent analysis in Section B: Considerations and Analysis and Section C: Delivery.

Considerations

- » Engineering design and risk analysis efforts are targeted so that an appropriate level of design and project knowledge is available to inform robust, reliable and transparent cost estimates in the reference project/s (refer **Appendix 3: Design, Cost and Risk**)
 - » The level of detailed analysis required (level of reference design) is fit for purpose, ensures decision-makers have confidence in the assessment and is aligned to an acceptable level of risk.
 - › In some cases, the level of design may be set by the project owner's decision-making requirements e.g. level of schematic design, investment class and feasibility requirements etc.
 - » Resources should be biased towards more detailed engineering and design efforts (see **Appendix 3: Design, Cost and Risk**)
 - » The level of design specification may change as a result of some of the technical analysis e.g. hydrology, geotechnical/utilities, engineering standards, cost and risk analysis.
 - » The reference project design specification should also be enhanced and refined as part of the Stage 3: Detailed Business Case development process incorporating sustainability, social, environmental, climate risk and resilience, economic, financial and affordability analyses (co-design).
 - › Consider future trends including:
 - quality of life and equity
 - cost of living and incomes
 - community preferences and expectations
 - economy and productivity
 - population and participation
 - technology and data
 - climate risk, environment and resilience.
- » Make note of any additional stakeholders who may be impacted by the reference project and incorporate in the Section B analysis e.g. SIE and economic analysis.
 - » The benefits to be achieved by the reference project should align to the 'benefits sought' documented in the service need section and the benefits register. When assessing opportunities for value creation and capture², care should be taken to identify the *additional* value from those opportunities.
 - » The recommended option/s should align with the criteria for success or benefits sought (outcomes KPIs instead of output KPIs) identified during Stage 2: Options Analysis development and further refined in the Stage 3: Detailed Business Case analysis. The rationale for the recommendation is based on the analysis undertaken during the Stage 2: Options Analysis and updated in the Stage 3: Detailed Business Case.
 - » Technical analysis used to inform reference project design and cost estimates is subject to appropriate assurance arrangements, including specialist peer and technical review undertaken by appropriately qualified peer reviewers (and supporting advisers) who are delegated to review analysis strictly within their domain of expertise (see **Appendix 3: Design, Cost and Risk**).
 - » Engineering and design efforts should align with best practice guidance (e.g. QDesign) from the Office of the Queensland Government Architect (OQGA).



Consult with Queensland Treasury about potential budget and funding implications of the proposal.

² As found in value creation and capture supplementary guidance to the Queensland Treasury Project Assurance Framework

Content to include

This section should include content as outlined in Table 9 below.

Table 9: Reference project content and considerations

CONTENT	CONSIDERATIONS
Objectives, outcomes and benefits	<p>Include a summary of the project objectives, outcomes and expected benefits. Explain how the reference project/s will address the service need.</p> <p>Provide a succinct overview of why the reference project is the preferred solution. Further analysis is considered at later stages of the Stage 3: Detailed Business Case.</p>
Scope	<p>Provide a summary of the project including key technical features e.g. design, geotechnical, functionality, operations, services, inclusions and exclusions.</p>
Activities	<p>Provide an outline of the proposed project program including scheduled critical path, early work, commissioning and overall project duration.</p>
Reference design	<p>Details of the reference design should include:</p> <ul style="list-style-type: none"> » assumptions underpinning the design » any constraints » specification of the level of the design as a percentage or class or category. <p>Note that the reference design can only be finalised after all assessments are completed, allowing its refinement during proposal development.</p>

Outcomes

The reference project should clearly establish the scope of the proposal including the level of design and risk tolerance.



If the reference project has significant ICT requirements, these considerations should be included as a separate section.

B4 Legal and regulatory considerations

Purpose

This section considers the legal, regulatory and approval requirements for the proposal (as outlined in the reference project section). The potential impact of these considerations contributes to the social, economic, environmental, sustainability, financial and commercial analysis.

Considerations

- » All business cases are different and, in some instances, legal and regulatory aspects may represent substantial risk and uncertainty. As such, the extent and focus of considerations need to be tailored on a fit-for-purpose basis.
- » Clearly document any legislative and regulatory arrangements which may prevent, impede or have a significant impact on the project/s benefits, costs and risks. Consider regulatory changes which may significantly enhance whole-of-system outcomes.
- » As legislation and policy requirements may be revised after completion of the business case, the actual suite of approvals, permits and licences shown in the Approvals Matrix will require further revision as the proposal progresses.
- » Where new legislation is proposed, a Regulatory Impact Statement (RIS) is required and should be included as an appendix to the Stage 3: Detailed Business Case.

Content to include

This section should include content as outlined in Table 10 below.

Table 10: Legal and regulatory content and considerations

CONTENT	CONSIDERATIONS
Legislative issues	Include specific legislative requirements or issues (both existing and foreshadowed) relevant to the reference project/s or its ongoing operation that may prevent, impede or have a significant impact. This may include items such as state and federal government agreements, planning, approvals and considerations of environmental, native title or cultural heritage issues.
Regulatory issues	List issues that may prevent, impede or have a significant impact on the reference project/s. <ul style="list-style-type: none"> » Issues may include consideration of guidelines and existing or anticipated directives issued by a Regulator. » Other considerations may include issues that influence competition or jurisdictional responsibilities.
Approvals	Reference approval processes that may impact the delivery of the reference project/s. <ul style="list-style-type: none"> » Considerations include timing, potential impediments to approvals and the approving authority. » Approvals may include permits, approvals, (such as building approvals, including a Ministerial Infrastructure Designation consistent with the <i>Planning Act 2016</i>), licences or other requirements. <p>Early engagement with other departments and regulatory agencies may assist in identifying approval requirements.</p>
Other legal matters	Include any other legal matters that may influence the reference project/s, for example: <ul style="list-style-type: none"> » standing agreements and existing contracts that may require renegotiation or payment of compensation or may restrict the actions of the government or agency e.g. competitive dealings » agreements or contracts in the process of being finalised or renegotiated » contractual disputes » claims by third parties including native title and cultural heritage » court decisions that may impact the legislative powers of government » legal or contractual issues associated with the proposed delivery model.

Outcomes

Legal and regulatory considerations should be reflected in the environmental assessment, the SIE, the risk assessment and, if required, the project cost estimates.

The reference project/s may need adjusting based on the results of this review. This is particularly relevant where the results impact negatively on the benefits sought or create disbenefits that cannot be effectively managed.

B5 Public interest considerations

Purpose

This section identifies:

- » whether the reference project/s will provide (perceived or real) equitable outcomes for stakeholders
- » potential negative impacts of the reference project/s to be managed and, where possible, adjusted to mitigate risks or realise opportunities.

Considerations

- » Where a Stage 2: Options Analysis has been completed, and the preferred option/s reviewed in Section A3: Service Need, the results should be refreshed to ensure no further public interest considerations have arisen.
- » Public interest issues may be identified during a community consultation process, environmental assessment, social impact evaluation (SIE), financial analysis or regional impact analysis.
- » Where community engagement has not been undertaken, the source of the assessment should be noted i.e. opinions of advocates and/or staff, experiences of similar projects.
- » The impacts of public interest considerations should be reflected in the deliverability assessment, the environmental assessment, the SIE, the risk assessment and the project cost estimates.

Content to include

The public interest considerations section should include information highlighted in Table 11.

Table 11: Public interest content and considerations

CONTENT	CONSIDERATIONS
Community consultation/ stakeholder engagement	<p>Include details of community consultation/stakeholder engagement throughout the proposal development processes in relation to public interest matters including:</p> <ul style="list-style-type: none"> » overall community consultation or stakeholder engagement approach » community consultation and stakeholder engagement activities e.g. information sessions, surveys and/or working groups » overall engagement outcomes » next steps or further consultation required. <p>The process involves confirming the impacts on all stakeholders (the community, service delivery partners, etc.) and understanding any new concerns that may not have been previously considered. The consultation process should also consider whether the project would likely receive a social licence to operate from the community. If not, consider whether it is worthwhile progressing. Potential remedies to any issues raised should be integrated into the reference project/s.</p>
Impact on stakeholders	<p>The reference project/s should be assessed for its potential impact on stakeholders, including individuals and communities. Include a list of stakeholders, their area of interest/impact and any engagement actions required. Areas of public interest may include:</p> <ul style="list-style-type: none"> » property impacts » environmental concerns » access or use changes.

CONTENT	CONSIDERATIONS
Social licence status	<ul style="list-style-type: none"> » Explain how this was assessed. » Provide the social licence status (disapproval, tolerance, endorsement or advocacy from the community).
Public access and equity	Public access and equity ensure services are available to relevant groups within society, if required. The reference project/s should be assessed to ensure that relevant groups within society can effectively realise the expected benefits of the investment. Documentation should include a list of any disadvantaged groups who will use the infrastructure or service, and how they will use it. If applicable, identify any areas of potential inequity of access resulting from the proposed location, pricing of services or any social and economic impacts.
Consumer rights	<p>Consumer rights are the legal and moral duties of protection owed by the supplier to a purchaser/user of goods or services. Consumer rights generally include:</p> <ul style="list-style-type: none"> » right to safety » right to be informed » right to choose » right to be heard. <p>This section should document any potential consumer rights impacts. In particular, outline where the reference project/s does or does not provide sufficient safeguards particularly for those to whom government has a higher duty of care. This is beyond any legal obligation, given government’s broad responsibility to the community and service recipients.</p>
Safety and security	<p>Safety and security considerations include corruption, crime, public health risk, quality and security of supply. The reference project/s should be assessed for any potential security and community safety issues.</p> <p>Security of supply is a particular concern when the market is immature.</p>
Privacy	<p>Identify potential privacy issues and the steps required to provide assurance that user rights to privacy are protected. Government obligations, whether in relevant legislation or government policy, should also be highlighted.</p> <p>This relates to both physical and information privacy during construction and operations.</p>

Outcomes

The public interest considerations section should clearly articulate the likely impacts on the community. It provides an indication of whether the proposed project is in the public interest.

B6 Sustainability assessment

Purpose

The sustainability assessment considers the design, construction applications and operational arrangements of a project to optimise governance, environmental, social and economic outcomes.

Considerations

- » The sustainability assessment should address how best to plan, design and deliver the options from a long-term, whole-of-life sustainability perspective. The overall sustainability of the proposal may influence whether the government chooses to fund it.
- » The sustainability assessment should significantly draw on the analysis undertaken throughout your proposal development, including the economic analysis, environmental assessment and social impact evaluation. These assessments should be based on a whole-of-life view of the proposal, and where relevant, a whole-of-system, whole-of-state approach. They should incorporate future trends, foresighting and resilience analysis. Such analysis might include considering forecast changes to: quality of life and equity; cost of living and incomes; community preferences and expectations; economy and productivity; population and participation; technology and data; environment; emissions reduction, climate risks, and resilience.
- » Queensland Government requires sustainability assessments for proposals with a capital value of more than \$100 million. Regardless of the capital value, it is best practice to look for opportunities to achieve sustainability benefits throughout the proposal lifecycle. This is particularly important in the case of building projects which often fall below this capital threshold, but may contain significant opportunities.
- » To assess sustainability opportunities that apply to the proposal, you should use either fit for purpose, nationally-recognised rating and certification schemes, tools and supporting technical expertise, or, at a minimum, apply the BCDF approach. Further guidance is given in Appendix 1.
- » Suitable assessment tools include:
 - » the Green Building Council of Australia's (GBCA) Green Star rating tools (Green Star—Design and As Built, and Green Star—Communities), which are used for building projects (inclusive of any type of commercial building, health, education and other similar infrastructure types, rail stations and residential apartment buildings), and master-planned precincts and communities (see www.gbca.org.au)

Sustainability analysis:

- » supports the effective and efficient use of resources
- » supports future-proofing proposals by considering future trends
- » encourages innovation in planning, design and delivery
- » considers opportunities to reduce emissions
- » provides assurance to decision-makers that determinations are based on a comprehensive view of governance, economic, social and environmental considerations
- » ensures the costs and benefits assessment includes broader sustainability considerations.

Assessing sustainability early in the proposal lifecycle will result in improved long-term community, environmental and economic outcomes.



- › the Infrastructure Sustainability Council's (ISC) Infrastructure Sustainability rating tools (Planning, Design and As Built and Operations), which are mostly used on transport infrastructure (e.g. roads, rail, port and airports); utilities (e.g. networks, pipelines and renewable energy assets); as well as green and blue infrastructure (e.g. waterways, reserves, recreation and cycle/walkways)¹. The ISC planning tool that applies throughout the various proposal stages includes a scorecard to assess the materiality of sustainability considerations and is available on the ISC website at www.iscouncil.org².

These organisations provide a range of tools to assess sustainability throughout a project lifecycle, and can also inform the environmental assessment undertaken at Section B8: Environmental assessment. They provide a common language for project stakeholders to understand what is required, and, where certification is achieved, help deliver independent third-party assurance to the community, investors, and government that project outcomes promised are delivered.

Leveraging sustainability expertise early in the proposal development phase and ensuring documentation (including risk and benefit registers) is carried through to project delivery as well as operations can assist with subsequent independent holistic third-party certification as it is sought.

Applying sustainability principles early can also maximise benefits and effectiveness. This helps determine 'what' should be built (a sustainable asset) and, later, 'how' it is built (a sustainability project), ensuring optimal outcomes are achieved at least cost.

Continuing sustainability assessment processes will enhance confidence that key performance and long-term sustainability outcomes will be delivered.

Queensland Government approach

The Queensland Government has collaborated with ISC and the GBCA to develop an approach for internal project teams to consider sustainability for both linear infrastructure and buildings.

For linear infrastructure, the approach with ISC has been developed across four assessment themes and 17 categories as outlined in Table 12.

Table 12: ISC sustainability assessment principles—linear infrastructure

GOVERNANCE	ENVIRONMENT	SOCIAL	ECONOMIC
<ul style="list-style-type: none"> › Context › Leadership and management › Sustainable procurement › Resilience › Innovation 	<ul style="list-style-type: none"> › Energy and carbon › Green infrastructure › Environmental impacts › Resources › Water › Ecology 	<ul style="list-style-type: none"> › Stakeholder engagement › Legacy › Heritage › Workforce sustainability 	<ul style="list-style-type: none"> › Options assessment and business case › Benefits realisation

- › The approach includes completion of an assessment template which may need support from a workshop/s to assess materiality of the criteria underlying the categories. Ideally, sustainability assessment considerations should be integrated with other detailed business case development work streams e.g. multi-disciplinary risk, co-design and/or value engineering workshops.
- › For building proposals, the Queensland Government has collaborated with the GBCA to develop a similar assessment approach aligned to the Green Star rating scheme and the associated holistic impact categories: management; indoor environmental quality; energy; transport; water; materials; land use and ecology; emissions; and innovation.

- › Principles considered in this assessment are included in Table 13: GBCA sustainability assessment principles—buildings. For building proposals, the evaluation may also need to include additional consideration of the principles in the sustainability assessment, listed in Table 12 above, to the extent that they are material.
- › The sustainability assessment templates and an example approach to internal validation and assessment, including a description and guiding questions for the principles, can be found in Appendix 1 of the BCDF Sustainability Assessment: Approach and Templates.

¹ In modern cities, the boundaries between property and infrastructure are increasingly blended (such as integrated station or over-station developments). Therefore ISC and the GBCA have collaborated to release guidance for projects seeking dual certification. This is intended to ensure efficient and streamlined certification of sustainability outcomes for both infrastructure and building projects within the infrastructure boundary.

² Queensland Government environment and science agencies have additionally collaborated with ISC to map longer term policy objectives. The ISC Policy Mapping Matrix has helpful recommendations for agencies on how to incorporate sustainability objectives in a business case.

Table 13: GBCA sustainability assessment principles—buildings

PROJECT SETUP AND MANAGEMENT	INDOOR ENVIRONMENT QUALITY	ENERGY	TRANSPORT	WATER	MATERIALS	LAND USE AND ECOLOGY	EMISSIONS	INNOVATION
Green star accredited professional ³	Indoor air quality	Greenhouse gas emissions	Sustainable transport	Potable water	Lifecycle impacts	Ecological value	Stormwater	Innovative technology or process
Commissioning and tuning	Acoustic comfort	Peak electricity demand reduction			Responsible building materials	Sustainable sites	Light pollution	Market transformation
Adaptation and resilience	Lighting comfort				Sustainable products	Heat island effect	Microbial control	Improving on green star benchmarks ³
Building information	Visual comfort				Construction and demolition waste		Refrigerant impacts	Innovation challenge ³
Commitment to performance	Indoor pollutants							Global sustainability ³
Metering and monitoring	Thermal comfort							
Responsible building practices								
Operational waste								

³ These components are not applicable at this early stage of proposal development.

Content to include

The sustainability assessment content and considerations is highlighted in Table 14.

Table 14: Sustainability assessment content and considerations

CONTENT	CONSIDERATIONS
Approach	Document the approach and methodology used to identify material sustainability considerations relevant to the reference project/s. This will help to understand and, where possible, avoid or mitigate immediate and long-term impacts (e.g. the Queensland Government approach outlined in Appendix 1: of the Sustainability Assessment: Approach and Templates)
Assessment	Document the outcomes of the sustainability assessment. For projects that are applying for an IS rating, or Green Star accreditation, the documentation may include a self-assessment against the applicable rating scheme tool, including benchmark targets.

Outcomes

The sustainability assessment, in combination with the socio-economic, financial and environmental assessments, provides evidence on how the proposal will contribute to quadruple bottom-line outcomes.

Sustainability issues should be reflected in the deliverability assessment, the environmental assessment, the social impact evaluation, the risk assessment and the project cost estimates. The benefits register, risk register, stakeholder engagement plan (where applicable) and appraisal summary table (AST) should be updated in response to the outcomes of this assessment.

Project handover documentation should detail and highlight the results of this assessment. It should identify material positive or negative impacts which affect the benefits sought or create disbenefits that cannot be managed, or require very careful ongoing management.

Where possible and defensible, include analysis and documentation of the costs and benefits associated with the sustainability assessment including future accreditation activities.

Where material, the conclusions, recommendations or implementation plan may include discussion of key sustainability considerations, risks and/or further actions recommended.

B7 Social impact evaluation

Purpose

The social impact evaluation (SIE) considers:

- » the social and other benefits of the proposed project
- » negative social impacts to be mitigated
- » opportunities to create additional social value for the proposed project.

The SIE provides a key input into the economic, environmental, sustainability, financial and commercial analysis.

Considerations

The social impact evaluation documents the positive contribution all infrastructure proposals make to society, as well as ensuring that any negative effects are identified and mitigated.

- » The social value is the incremental change between the social impact baseline and the implementation of the project.
- » Where social benefits are included in the economic analysis, these benefits will be considered in terms of the change between the base case and the implemented project.



The Social Impact Evaluation Guide gives detailed guidance on how to undertake a social impact evaluation.



The SIE focuses on three key areas:

- » What value will the option achieve?
- » What negative effects need to be mitigated and, when mitigated, what is the residual impact?
- » What additional opportunities could be designed into the option to create additional value?

Social impacts should be considered and described in terms of their relationship to the community stakeholders.

Where a proposal has had a social impact assessment (SIA) included as part of an environmental impact assessment (EIA), you should review the findings of the SIA and consider any additional analysis required by a social impact evaluation (SIE).

Social impacts do not need to be measurable to be considered.



Social impacts are considered within the economic, financial, risk and delivery analyses in accordance with Table 15: Relationship matrix.

Table 15: Relationship matrix

RELATIONSHIP BETWEEN SOCIAL IMPACTS AND APPROACH				
	QUALITATIVE	QUANTIFIED	MONETISED	ARTEFACT
Social impacts	✓	✓	✓	Include in SIE, economics, CBA, benefits register and risk register
	✓			Include in SIE, economics, benefits register and risk register
	✓	✓		Include in SIE, economics, benefits register and risk register

Content to include

This section should include content as outlined in Table 16 below.

Table 16: Social impact content and considerations

CONTENT	CONSIDERATIONS
Approach	Document how the SIE was undertaken
Social impact baseline	Document the social impact baseline
Evaluation	Document the outcomes of the SIE using the template provided
Impact summary	Document: <ul style="list-style-type: none"> » the value the proposed project is expected to achieve » the negative impacts and how they will be mitigated » opportunities for enhancing positive impacts.

Outcomes

The reader should understand the following:

- » the social value the project is expected to create, described in terms of the impact on stakeholders
- » how any social risks will be mitigated
- » what further opportunities to create social value are possible but not currently included within the reference project/ implementation plan.

B8 Environmental assessment

Purpose

This assessment examines the project’s environmental impacts and/or enhancements and includes specific actions required to meet all relevant policy, regulatory and legislative requirements as well as any likely community concerns.

Considerations

Review and update any analyses from previous investigations e.g. the options analysis or an EIA, and the sustainability assessment undertaken at B6, considering any relevant information obtained since their completion.

- » The environmental assessment is based on a whole-of-life, whole-of-system, whole-of state approach, incorporating future trends, climate change, foresighting and resilience analysis.
- » Environmental considerations may include policy, regulation or legislative requirements.
- » Where required, expenses to avoid, mitigate or offset environmental impacts should be costed in the proposal financial and economic assessments.



Environmental assessments:

- » identify and review information from previous relevant studies
- » identify all potential environmental issues and impacts
- » assess how environmental issues may impact on the reference project/s
- » draw on the sustainability assessment undertaken at B6.

- » Community expectations and/or government policy, regulation or legislation may require some environmental impacts be avoided, mitigated or offset. The costs associated with any avoidance, mitigation or offsetting should be included in the financial and economic analyses.

Residual environmental impacts are considered in the economic or social analyses, refer Table 17.

Table 17: Relationship matrix

RELATIONSHIP BETWEEN ENVIRONMENTAL IMPACTS AND APPROACH				
	QUALITATIVE	QUANTIFIED	MONETISED	ARTEFACT
Environmental impacts	✓	✓	✓	SIE, economics, CBA
	✓	✓		SIE, economics
	✓			SIE, economics

Content to include

The environmental assessment should respond to all considerations in Table 18.

Table 18: Aspects and considerations

ASPECT	CONSIDERATIONS
Legislation and permit requirements	<ul style="list-style-type: none"> » Identify and consider the impact of any legislative obligations and approvals required (in addition to those noted in B4) » Perform high-level cost and time calculations for each requirement

ASPECT	CONSIDERATIONS
Planning and land use	<ul style="list-style-type: none"> » Review current land uses » Consider potential changes to land use during the construction and operational phases of the project (where appropriate) » Describe the degree of alignment to relevant plans and how the project contributes (or fails to contribute) to any environmental schemes
Property impacts	<ul style="list-style-type: none"> » Identify and describe any impacts to public and private property (if not already noted in B7)
Topography, geology and soils	<ul style="list-style-type: none"> » Consider sediment and erosion-control management » Identify relevant matters in the Environmental Management Register and Contaminated Land Register
Water quality: consider both surface water and ground water	<ul style="list-style-type: none"> » Provide information on any existing management strategies as well as proposed infrastructure » Describe strategies to manage existing or potential water quality issues
Hydrology	<ul style="list-style-type: none"> » Undertake high-level hydrological and hydraulic investigation, analysis and assessment of any infrastructure options to assist in refining the design and providing input for the detailed planning and costing
Climate and air quality	<ul style="list-style-type: none"> » Detail the potential impacts of climate and seasonal variations on design and project delivery » Detail the potential impacts and strategies for managing air quality issues during project delivery
Flora and fauna	<ul style="list-style-type: none"> » Describe important flora and fauna (including aquatic flora and fauna if relevant) » Identify strategies for habitat management » Consider habitat connectivity » Consider weed management implications » Consider remnant vegetation management implications » Consider storm water management implications
Climate change and emissions	<ul style="list-style-type: none"> » Consider and describe how the project will mitigate climate change by contributing to a reduction in global carbon emissions
Noise and vibration	<ul style="list-style-type: none"> » Detail the potential impacts and strategies for managing noise and vibration issues during project delivery » Detail the potential impacts and strategies for managing noise and vibration issues (where appropriate) post project delivery
Landscape and visual amenity	<ul style="list-style-type: none"> » Describe any impact on visual amenity » Identify strategies to respond to issues relating to visual amenity and landscape impacts during and post delivery
Cultural heritage	<ul style="list-style-type: none"> » Provide a statement of places with known or potential historical significance » Detail strategies for managing any potential impact on cultural heritage
Waste management	<ul style="list-style-type: none"> » Consider waste management during project delivery and operation

Outcomes

The environmental assessment should clearly articulate and assess:

- » the project’s environmental impact
- » specific actions required to meet all relevant policy, regulatory and legislative requirements
- » any community concerns.

B9 Economic analysis

Purpose

The economic analysis develops a coherent socio-economic narrative of the qualitative and quantitative costs and benefits of the proposal. It should be supported by a robust and transparent cost benefit analysis (CBA) and social impact evaluation (SIE).

Considerations

- » The socio-economic (economic) analysis should synthesise a clear narrative around the quantitative and qualitative benefits and costs of the reference project/s on the community. This analysis will entail robust and transparent CBA, SIE, benefits analysis, financial, commercial, sustainability and environmental assessments.
- » The balance of this qualitative and quantitative economic narrative will vary across proposals, the suitability of which depends on the purpose of the assessment and the availability of data and other resources. Fundamental to economic analysis is that all material social benefits and costs are identified and documented as comprehensively as possible. These benefits and costs are characterised by impacts on people, rather than impacts on organisations or decision-makers and are characterised by observable consequences that are material and/or measurable.
- » This assessment draws on analysis undertaken throughout the life cycle of the proposal development including, but not limited to, the financial analysis, environmental, sustainability and SIE. The assessment is based on a whole-of-life, whole-of-system, whole-of-state approach incorporating future trends, foresighting and resilience analysis (including scenario and sensitivity analysis).
- » Consider future trends including:
 - › quality of life and equity
 - › cost of living and incomes
 - › community preferences and expectations
 - › economy and productivity
 - › population and participation
 - › uncertainty and risk, including changes in technology, demographics, climate and environment.
- » The goal of economic analysis conducted in the Stage 3: Detailed Business Case is to document the economic merit of the preferred option/s. Identifying all costs and benefits is fundamental to any economic analysis. You can find specific guidance for the CBA in the Cost Benefit Analysis Guide.



The BCDF guidance for the economic CBA, approach, reporting, checklists and assurance requirements can be found in the Cost Benefit Analysis Guide.



It is important that the economic analysis considers whole-of-life, whole-of-system and whole-of-state implications.

As the economic analysis involves forecasts of an uncertain future (due to technological change, climate change, demographics, globalisation etc.) all aspects of the analysis should incorporate foresighting and scenario-testing these uncertainties and risk. For example, in considering climate risk adaptation and mitigation, you need to assess costs, benefits and risks for supply, demand and market developments, as well as considering opportunities.

As uncertainty normally increases with time, resulting in declining confidence in forecasts and projections, you will need to set a timeline for the evaluation period, capturing residual economic values (if any) and the profile of benefit and cost flows.

- » Where value creation and capture (VCC) opportunities have been identified, care should be taken to avoid double-counting of benefits and the value uplift associated with these benefits. For example, counting travel time benefits and any consequent land value uplift.
- » Care should be taken to ensure any value creation and capture analysis is undertaken from an economic perspective, refer to Section B10: Financial Analysis for guidance on VCC analysis.

Content to include

The economic analysis and documentation should include the content and considerations as outlined in the CBA Guide and in Table 19.

Table 19: Economic analysis content and considerations

CONTENT	CONSIDERATIONS
Approach	<p>As outlined in the CBA Guide, clearly and transparently document the approach adopted. This should be highly detailed, transparent and include reference to and documentation of:</p> <ul style="list-style-type: none"> » all significant qualitative and quantitative benefits, costs and risks (including sensitivity analysis) » assumptions underlying the CBA e.g. base price year, discount rate, modelling and forecasting assumptions including, where appropriate, consideration of resilience and climate change risk sensitivity analysis and scenarios » key inputs: costs, demand modelling for the analysis and key analytical observations e.g. elasticity of demand » detailed description of the base case and the analysed options. <p>Document how the assessment was undertaken, its assumptions and limitations.</p>
Benefits	Evaluate all qualitative and quantitative benefits.
Costs	Evaluate all qualitative and quantitative costs.
CBA results	Undertake a robust CBA analysis e.g. net present value (NPV), benefit cost ratio (BCR), internal rate of return (IRR), and sensitivity and scenario analysis.
Economic analysis narrative	Document a coherent economics narrative which incorporates the qualitative and quantitative cost and benefit analysis in the SIE and CBA.
Sensitivity and scenario analysis	Conduct a sensitivity analysis of all parameters (not a simple +/-20% or 30% etc.) as outlined in the CBA Guide. Document scenario analysis including foresighting and alternate futures.
Quality assurance review results	Document the process and outcomes of the peer review analysis (and, where relevant, a Gateway review) including robust and transparent consideration of how to resolve any issues. Confirm CBA analysis against Section 6.1 Quality and 6.2 CBA Health Check in the CBA Guide.

Outcomes

A clearly articulated and transparent economic analysis provides:

- » a coherent statement of the socio-economic narrative supporting the merit of the project which can then be incorporated into the conclusions, recommendations and executive summary
- » robust and transparent documentation of the key assumptions and methodology
- » transparent documentation of all benefit and cost cashflows for all years in the evaluation period
- » robust analysis of uncertainty and risk including sensitivity and scenario analysis
- » transparent documentation of assurance activities to support a robust and defensible economic analysis.

B10 Financial analysis

Purpose

Financial analysis should support robust and transparent investment decisions by:

- » developing sound budget estimates for capital and operating cashflow to inform the budget viability of the proposal
- » analysing and quantifying proposal risks across options to inform the uncertainty surrounding proposal costs and benefits
- » linking capital costs in the proposal budget to whole-of-life costs for service delivery to inform the impact on ongoing budgeting requirements for both operating and maintenance costs
- » evaluating against capital and operating budget or funding constraints to determine whether the proposal can achieve the service need within capital constraints
- » developing and evaluating pre-feasibility commercial investment metrics (if required) to determine whether the proposal is commercially viable (if appropriate).

A well-articulated and robust financial analysis will ensure decision-makers gain a clear understanding of the financial costs, revenues and risks of the reference project/s including, where appropriate, critical information on commercial viability.

The financial analysis also provides critical cost and risk information for the economics, affordability and delivery model analysis. Where appropriate, it includes full and transferable building information modelling (BIM) information for the next stage of the proposal life cycle (procurement and delivery).

The financial analysis should follow the proposal owner's BIM requirements and clearly document how these would be adopted. The costs of BIM analysis, including maintenance of a BIM model for the life cycle of the proposal, should be considered.



Considerations

- » The financial analysis comprises three evaluations:
 1. budget analysis (mandatory)
 2. structuring analysis (to be developed depending on the circumstances surrounding the investment)
 3. commercial analysis (to be developed for commercial investments).
- » Some of the key considerations supporting a robust, transparent and clearly articulated financial analysis (financial analysis summary, report and appendices) include:
 - » clearly documenting the financial analysis approach and analytical outputs necessary to inform the CBA
 - » evaluating the budget analysis and affordability requirements for the proposed investment and, where appropriate, a commercial investment evaluation (pre/feasibility or feasibility assessment)
 - » evaluating whole-of-life, whole-of-system and whole-of-state financial implications
 - » aligning with the assessment and methodology in the economic analysis for the base case, service need (demand), evaluation period and terminal/residual values
 - » calculating the most likely outcome e.g. expected value which is likely to be different from the P50 value. Report the full profile of outcomes including the 50th and 90th percentile values (P50 and P90) and level of design (percentage or class etc.) utilised
 - » fully analysing and justifying the rationale underpinning the methodology, data and assumptions. Where appropriate, analyse their significance for the financial investment evaluation e.g. use an assumptions book in the financial modelling analysis
 - » fully analysing and justifying the rationale for all parameters used in a robust financial analysis
 - » fully analysing and justifying the rationale for risk quantification across all parameters including OPEX, CAPEX and revenue showing how they have been incorporated into the analysis. Include any residual risks that require further consideration in the next stage of the investment lifecycle or may be material for the investment decision (See more details in the section on financial risk considerations on the next page).

- › undertaking sensitivity analysis to evaluate the key variables and assumptions that impact on the estimated financial and budget outcomes. They must be evaluated to the lowest level for CAPEX, OPEX, revenue elements and risks to determine which are most sensitive to changes
- › Employing robust deterministic and/or probabilistic methods for sensitivity analysis, including clearly and transparently outlining all assumptions and derivations (refer **Appendix 3: Design, Cost and Risk**)
- › Ensuring sensitivity analysis methods and results are peer-reviewed to ensure contingency estimates are justifiable and defensible (refer **Appendix 3: Design, Cost and Risk**)
- › When undertaking probabilistic sensitivity analysis, using well-specified design and cost inputs in line with industry benchmarks and guidelines, and provide sufficient data to support statistical estimation and analysis, and correctly applying and interpreting results (refer **Appendix 3: Design, Cost and Risk**)
- › undertaking scenario analysis to evaluate alternate futures, or other macro-influences. This is a key input for the socio-economic, environmental and sustainability analysis
- › evaluating the budget analysis to determine both the absolute and incremental effect on the forecast budget for both the proponent and the state. Check whether the investment is within expected capital and operating constraints.
- » As input into section B11: Affordability analysis, evaluate the financing and funding structure to determine the most appropriate approach e.g. government provision, joint venture. This will include evaluating key contractual terms and conditions for proposed structures e.g. term sheets.
 - › Financing structures are integrally linked to how the infrastructure will be procured including government provision and Public Private Partnerships (PPP).
 - › Structuring analysis also determines the most appropriate funding structures including user-contributions e.g. pricing, value capture and private sector contributions.
 - › Where user-contribution structures are considered, the approach should be re-evaluated to reflect different pricing and evaluation e.g. discount rate.
 - › The evaluation should identify the key risks/benefits of each structure and recommend a preferred approach for the proposed investment.
- » Summarise the key issues from the evaluation in a summary table including key financial parameters in nominal (budget) and net present value terms if required, for commercial assessments, options (scope) analysis and/or cost effectiveness analysis.

Financial risk considerations

- » There are two broad ways to identify risk:
 1. Qualitative risk assessment is the first step in risk assessment and involves determining, for each identified risk:
 - a. the triggers of risk, their impacts and the likelihood of those occurring
 - b. the consequences of the risk and any risk mitigation with revenue or cost consequences.
 2. Quantitative risk assessment involves assessing the likelihood of the risk happening and the associated financial consequences. It combines:
 - a. the likelihood of costs, revenues and benefits being different from the expected values
 - b. the consequences i.e. the difference between the actual and expected values.
- » The likelihood of the risk happening, and its consequences determines the quantum of the risk, and the level of risk analysis and mitigation you need to undertake. The outputs of risk assessments can be simulated using a probabilistic, Monte Carlo or other simulation, which will give the probability of different revenue and cost estimates.
- » Not all risks you identify will affect revenues or costs but some risks may have wider implications for social, environmental or economic outcomes.
- » Undertake benchmarking of the risk allocation against previous and similar projects (if available) to determine whether the proposed risk allocation is broadly consistent. Benchmarking helps give decision-makers further confidence that costs are realistic and unbiased.

Quality assurance review

Conduct an independent peer review of the financial analysis to assist its development and to confirm the soundness and appropriateness of the methodology, technical procedures and processes associated with the analysis and results.

The review report should include a summary of the independent peer reviewer's findings, particularly in relation to the adequacy of rationale documentation, methodology, key risks and uncertainties, assumptions and results.

Seek ongoing technical advice throughout the financial analysis process to ensure a robust and transparent analysis.



Key considerations

A robust financial analysis includes the following key considerations:

- » The evaluation period and methodological basis for determining terminal value should be aligned with best practice project evaluation techniques and finalised in the methodology documented at the commencement of the financial analysis—refer Section B2: Base case and Section B9: Economic analysis.
- » For true comparison, collect revenue and costs for the same base year (real values).
- » 'Nominal dollars' are values at a specific point in time, are usually across financial years, and are unadjusted. When you collect information from the cost estimator and other contributors to the analysis, the base year must be clear and agreed.
- » 'Real dollars' have been adjusted for inflationary effects. Escalation rates must be clearly identified in generating outturn amounts.
- » All current and future cashflows should be identified and have supporting data (historical, forecast or benchmarked).
- » The discount rate is applied to nominal cashflows to account for the risk associated with the proposal and the time value of money (in all cases the discount rate used should match the cash flows it is applied to).
- » Ensure terminal value estimates (which in many instances will be very low or nil) comply with national and international accounting practices e.g. consider accounting depreciation values in the context of asset impairment, mark to market values, uncertainty and commercial and economic reality.
- » In all cases residual or terminal value estimates include end-of-life capital and exit costs. This means, in some cases, terminal value may be negative.

The approach to conducting a financial analysis should:

- » identify all whole-of-life, whole-of-system and whole-of-state cashflows (i.e. capital and operating costs) over the life of the project
- » identify and assess the ongoing risks that might create, enhance, prevent, degrade, accelerate or delay the expected cashflows
- » risk-adjust all revenues and costs, as appropriate. Report Monte Carlo or other risk analysis summary results including key risks, modelling and full financial NPV distribution profiles (including most likely or expected values), P50 and P90 values. Note the level of design or class used.
- » consider budgetary impacts, as well as potential government (local, state and federal) funding sources
- » conduct a stringent independent peer review of all financial analysis assumptions, methodology and outputs, and resolve any issues to ensure a robust and transparent analysis.



Commercial considerations

Commercial analysis should be undertaken in accordance with best practice investment standards while ensuring the analysis also meets the requirements of the investing parties and shareholding minister's department.

The commercial analysis should include relevant stakeholder input to ensure it facilitates informed investment decisions. It should also include financial and due diligence information to allow a robust, transparent, thorough and substantiated evaluation of the proposal.

Consider the following when conducting the commercial analysis:

- » expected revenues including competitive environment, market risk, etc.
- » contractual arrangements such as take or pay arrangements, etc.
- » investment risk profile and associated risk/return profile
- » competitive neutrality (as appropriate)
- » regulated returns (as appropriate)
- » pricing methodology
- » financing structures, ownership structures etc.
- » risk mitigation, back-to-back contracting, counter party risk, etc.



The analysis and its outcomes, including the methodology, assumptions and outputs, should be documented and independently peer reviewed.

Value creation and capture

Some projects present opportunities to deliver enhanced public value creation through strategic project design. As part of broader financial analysis, proponents should consider the potential for additional revenue streams from value creation and capture (VCC) opportunities.

VCC provides:

- » a potential model for additional funding streams
- » a better beneficiary-contributes approach to traditional public-funding
- » analysis and evidence base to support implementation of more equitable infrastructure funding models.

APPLICATION

Consideration of the Value Creation and Capture Guidelines¹ is a requirement for Queensland Government agencies and delivery partners when delivering significant state government infrastructure investments.

In line with grouping like project as a program, VCC opportunities can be applied across a program of works.

Project sponsors should follow the implementation steps outlined below. Value creation activities will not always be followed by the implementation of a value capture mechanism, as the required implementation steps are constrained by the principles. If the steps are unable to be completed in accordance with the principles, then project sponsors may decide not to proceed. For instance, if agencies are not able to clearly identify the value being created, or explicitly identify the beneficiaries, then value capture may not be viable and subsequent implementation steps are not required.

While consideration of the Value Creation and Capture Guidelines is a requirement, implementation of VCC will only be appropriate in particular circumstances. Any application of a specific VCC mechanism will need to be considered on a case-by-case basis and is subject to Cabinet Budget Review Committee consideration as part of the broader project approval process.

Defining Value Creation and Capture

VALUE CREATION

Value creation delivers enhanced public value. Emphasising value creation through strategic project design can lead to enhanced economic and financial, social, and environmental outcomes. Examples of benefits could include increased job opportunities and workforce participation, increased recreational infrastructure and green space, improved accessibility and public safety for users (for example, seniors and people with disability) and enhancement of natural catchment areas.

VALUE CAPTURE

Value capture is the act of collecting a portion of the benefits from public infrastructure investments that flow to the value of land or increased activity. The application of value capture funding mechanisms can help to meet the cost of establishing, upgrading and maintaining a wide variety of infrastructure forms.

Principles

VCC principles (or considerations) should be applied to the analysis of VCC opportunities. The principles provide a framework for considering the application of value capture mechanisms in the development of infrastructure funding strategies.

¹ As found in supplementary guidance to the Queensland Treasury Project Assessment Framework.

VALUE CREATION MUST BE INTEGRATED INTO PROJECT DESIGN

Integrated planning will maximise productivity and liveability returns and optimise both the core objectives and the value creation opportunities generated by the infrastructure.

CREDIBLE ANALYSIS OF BENEFITS, COSTS AND RISKS

Value creation and capture approaches should be underpinned by an evidence base, including credible investigation of benefits, costs and risks. Value capture is a funding mechanism and its 'costs' and 'benefits' are distinct from those that are captured in the economic analysis (i.e. they should *not* be incorporated in the CBA).

VALUE CAPTURE MUST CONSIDER EQUITY AND FAIRNESS

Value capture mechanisms provide for beneficiaries of infrastructure investment to make a fair and proportional contribution to the cost of that infrastructure.

There should be a clear nexus between the value created by the infrastructure, the beneficiaries who are in receipt of that value and the transparent application of funding mechanisms that provide for sharing of value to fund infrastructure provision.

APPLICATION OF VALUE CAPTURE MUST BE PRACTICAL

Like all sources considered for proposal funding, value capture must be transparent, practical and efficient to apply.

A SOCIAL LICENCE MUST BE DEVELOPED

Where appropriate, value capture infrastructure projects should involve stakeholder consultation and engagement to identify expected beneficiaries and build effective social licence. This may include comprehensive stakeholder engagement.

GOVERNANCE STRUCTURES MUST BE FIT FOR PURPOSE TO DELIVER VALUE CREATION AND CAPTURE

Appropriate governance arrangements will need to be implemented. This should be 'fit for purpose', reflecting the project characteristics, combination of participants, funding sources and risk allocation.

VALUE CREATION AND CAPTURE SHOULD SUPPORT SUSTAINABLE DEVELOPMENT

State and local government planning frameworks contain provisions to promote sustainable development, including sustainable settlement patterns and sustainable urban design.

This includes ensuring that all environmental, societal and economic considerations are appropriately balanced.

Implementation steps

There are five key steps outlined in the Value Creation and Capture Guidelines that are designed to guide consideration of value creation and capture in the development of major projects or programs across the project lifecycle. If at the Stage 2: Options Analysis, the Value Creation and Capture Guidelines are not met (i.e. the principles are not satisfied) then value capture analysis would not proceed from Stage 3: Detailed Business Case onwards. Value creation and capture opportunities identified at the Stage 2: Options Analysis should again be considered and confirmed at the Stage 3: Detailed Business Case.

1. IDENTIFY THE VALUE CREATED BY THE INFRASTRUCTURE

Value capture allows the identification and capture of an equitable portion of the value released by new infrastructure. It is fundamental to a value capture approach that the value uplift benefits from the infrastructure are clearly established.

2. IDENTIFY THE BENEFICIARIES THAT CAN REALISE THE VALUE

Beneficiary mapping should be completed during analysis to ensure a clear line of sight to the outcomes to be achieved for those parties and the value capture mechanisms that can potentially generate funding streams.

Potential beneficiaries include: landowners, occupiers, and developers; users and operators; businesses; and governments.

3. VALUE THE BENEFITS THAT CAN BE REALISED BY THE BENEFICIARIES

In order to make the case for value capture, it is necessary to not only identify the value created by infrastructure and the beneficiaries of that value, but to have a reliable and feasible means to estimate how much value can be realised by these beneficiaries such that relevant capture mechanisms can be equitably designed and applied.

4. CONSIDER SUITABLE MECHANISMS

Value capture mechanisms are the instruments by which the value created by the infrastructure or planning decision can be captured and used to contribute to the cost of delivery. There a variety of potential mechanisms – both passive and active – to be considered.

5. IMPLEMENT MECHANISM AND REALISE FUNDING

Once implemented, the funding derived via the project mechanism should be used to contribute toward the cost of funding the infrastructure project or program or, where appropriate, to contribute toward the general cost of core government infrastructure provision and service delivery.

ADDITIONAL GUIDANCE MATERIAL

In considering VCC analysis, a range of other publications may be useful. These include:

- » Queensland Government Project Assessment Framework Value Creation and Capture Guidelines, 2024 found at: <https://www.treasury.qld.gov.au/programs-and-policies/project-assessment-framework/>
- » Victorian Government, Department of Premier and Cabinet, Value Creation and Capture Framework, February 2017, <https://www.vic.gov.au/value-creation-and-capture-framework> <https://www.vic.gov.au/value-creation-and-capture-framework>
- » Infrastructure Australia, Capturing Value: Advice on making value capture work in Australia December 2016 <https://www.infrastructureaustralia.gov.au/publications/capturing-value-advice-making-value-capture-work-australia>
- » Global Infrastructure Hub, Innovative Funding and Financing Framework, <https://www.gihub.org/innovative-funding-and-financing/> <https://www.gihub.org/innovative-funding-and-financing/>
- » Global Infrastructure Hub, Case Studies <https://www.gihub.org/innovative-funding-and-financing/case-studies/>
- » Infrastructure Australia, Assessment Framework, July 2021 <https://www.infrastructureaustralia.gov.au/publications/assessment-framework>

Content to include

This section should include content as outlined in Table 20 below.

Table 20: Financial analysis content and considerations

CONTENT	CONSIDERATIONS
Approach	Document the approach used in the analysis as outlined above
Financial analysis	<p>Evaluate the financial analysis results including:</p> <ul style="list-style-type: none"> » the budget impact of all revenues and costs (both capital and operating costs) » a summary of the revenues and costs in nominal (budget) and where appropriate present value (PV) terms, together with any necessary commentary concerning specific associated issues. Calculate a financial net present value (FNPV) applying an appropriate risk-adjusted discount rate. In all cases, the discount rate should be consistent with the type of cash flows it is applied to e.g. real or nominal » budgetary impacts, as well as potential government (local, state and federal) funding sources for the reference project/s, including opportunities for value creation and capture. » risk adjust all revenues and costs. Report Monte Carlo analysis summary results including key risk, modelling assumptions (including level of design) and report full FNPV distribution profiles including identifying most likely (or expected value), P50 and P90 values.
Sensitivity analysis	<p>Evaluate the financial sensitivity analysis results of key parameters including e.g. using summary information from the Monte Carlo analysis.</p> <p>This should not be a simple +/- percentage of aggregate cost but key parameters noting the level of design or class used.</p>
Quality and assurance	Document the process and outcomes of the peer review analysis (and, where relevant, Gateway review) including robust and transparent consideration of the resolution of any issues.
Building information modelling	<p>The financial analysis should align with the relevant project owner’s building information modelling (BIM) requirements and should clearly document the adoption of these requirements.</p> <p>Agency costs for using BIM on a project may need to consider:</p> <ul style="list-style-type: none"> » maintenance of models for the life of the asset » capacity and capability development where there is an identified need for in-house expertise (usually outsourced) » efficiency benefits from using BIM.

CONTENT	CONSIDERATIONS
<p>Value capture</p>	<p>The opportunity for value creation and capture opportunities to assist in funding proposals should be explored in any Stage 3: Detailed Business Case. Value capture involves the extraction of funding contributions from those who derive a benefit (other than users) from infrastructure. Most commonly, value capture mechanisms are targeted at capturing a portion of the uplift in land values attributable to infrastructure investment.</p> <p>Appropriately designed value capture mechanisms can assist in funding infrastructure projects and have efficiency and equity advantages relative to government contributions in some circumstances. If value creation and capture opportunities are identified at Stage 2, value creation and capture assessment undertaken as part of a Stage 3: Detailed Business Case uses the following five-step process:</p> <ol style="list-style-type: none"> 1. identify the value created by the infrastructure (reconfirm Stage 2 assessment) 2. identify the beneficiaries that can realise the value (reconfirm Stage 2 assessment) 3. value the benefits that can be realised by the beneficiaries (reconfirm Stage 2 assessment) 4. consider suitable mechanisms to capture value 5. implement mechanism and realise funding. <p>By the conclusion of Stage 3: Detailed Business Case, where VCC opportunities are apparent, all steps should be completed.</p> <p>Appropriate considerations include:</p> <ul style="list-style-type: none"> » VCC opportunities were identified for further development in Stage 2: Options Analysis » the potential viability of VCC mechanisms, based around identification and practicality » whether the proposed investment offers value uplift that can be identified and evaluated, including for example, offering enhanced commercial opportunities » relative place within a program. For example, where previous similar or related projects (as part of a program) developments have been assessed for VCC opportunities, then these opportunities may be further developed in the context of the current project. <p>Where value uplift is identified, the evaluation of mechanisms that could be employed to capture that uplift is guided by the following principles:</p> <ul style="list-style-type: none"> » Value creation must be integrated into project design » Value creation and capture must be guided by credible analysis of benefits costs, and risks » Value capture must consider equity and fairness » Application of value capture must be practical » Social licence must be developed » Governance structures must be fit-for-purpose » Value creation and capture should support sustainable development. <p>Consideration of commercial opportunities should align with recently developed ‘Value Creation and Capture Guidelines⁴’. In addition, stakeholder consultation and support are critical to the successful implementation of value capture mechanisms.</p>

⁴ Queensland Treasury Project Assessment Framework Value Creation and Capture Guidelines.

Outcomes

A well-articulated and robust financial analysis provides a clear understanding of the financial costs, revenues and risks of the investment proposal including, where appropriate, critical information on commercial viability.

The financial analysis will:

- » clearly highlight expected risk adjusted cost and revenue estimates
- » highlight the proposal risk and their implications for the proposed investment
- » link capital costs in the proposal budget to whole-of-life costs for service delivery to inform the impact on ongoing budgeting requirements for both operating and maintenance costs
- » evaluate and clearly articulate capital and operating constraints to highlight whether the investment can achieve the service need within capital constraints
- » consider finance and funding alternatives as part of B11: Affordability analysis.

B11 Affordability analysis

Purpose

The affordability analysis allows decision-makers to assess whether the reference project/s is affordable over the whole of its life. It considers all sources of existing funding as well as additional funding from other sources.

All infrastructure investments will require funding over the life of the project regardless of the mechanism used for finance. Funding is required to pay for both the initial cost of the investment (construction) and the ongoing maintenance and operation of the infrastructure service.

Considerations

This section brings together a range of economic, financial and delivery analysis in the Stage 3: Detailed Business Case.

Project affordability is measured by the expected risk-adjusted finance net cost (both direct and indirect) to the state of delivering the reference project/s through traditional delivery.

Queensland Treasury should be consulted for assistance relating to the potential for private sector funding and/or financing.



Funding principles

There is currently no universal framework for determining the optimal mix of funding sources for infrastructure investments. The characteristics of the industry, infrastructure and commerciality will affect the available funding sources. Consider these core principles in assessing the mix of funding sources for each infrastructure investment:

- » User-contribution mechanisms potentially allow infrastructure to be provided cost effectively and may increase willingness to invest in new infrastructure.
- » Value capture mechanisms can be considered where the infrastructure will benefit stakeholders who are not just the direct users.
- » Developer contributions are usually expected for infrastructure that is necessary for land or property development.
- » Certain infrastructure types and/or public goods provision will have limited application under user-contribution or value capture mechanisms. Hence, government funding will likely be required where users do not pay and/or where beneficiaries cannot be identified.

Overlaying these principles are a number of other important considerations including:

- » A funding mechanism may generate community cost and not deliver net positive benefits.
- » User-charging may only fund marginal private benefit leading to the undersupply of infrastructure and limiting the positive benefits to the wider community.
- » The funding mechanism should consider public equity effects of user charges or value capture mechanisms.
- » Vertical equity should consider whether those on lower incomes are bearing a relatively greater burden than those on higher incomes.
- » Horizontal equity should consider whether infrastructure beneficiaries are bearing more of the funding burden than those who do not benefit.
- » Consider current community and industry acceptance of funding methods e.g. user charges, developer contributions and asset sales.

Funding envelope

The capacity to fund new infrastructure investments will be limited by the available funding options.

As such, funding sources are critical as the willingness of the public to pay either taxes/charges or accept a reduction in the quality or quantity of government services will impact the quantum of new infrastructure development/replacement.

Content to include

This section should include content as outlined in Table 21 below.

Table 21: Project affordability content and considerations

CONTENT	CONSIDERATIONS
Approach	Describe the approach for undertaking the affordability assessment including documentation of any limitations and assumptions.
Funding options	<p>There are five common options for funding of infrastructure investments:</p> <ol style="list-style-type: none"> 1. government appropriations 2. user-contribution mechanisms 3. value capture mechanisms 4. developer contributions 5. asset sales. <p>Funding should consider both the initial cost of the investment (construction) and the ongoing maintenance and operation of the infrastructure.</p> <p>Provide clarity around the initial investment either upfront (equity) or over time (debt) and consider a series of repayments.</p> <p>Refer Appendix 2: Funding options.</p>
Analysis outcomes	<p>Present the results of the affordability assessment, acknowledging all underpinning assumptions from the Stage 3: Detailed Business Case assessments including the implication of changing the preferred delivery model.</p> <p>Identify the affordability of the reference project/s. This could include an assessment of staging options, revenue sources (if applicable), preferred delivery options and funding availability (in terms of both capital and operating costs), conditions and timing—acknowledging that the delivery options under consideration will have implications for funding profiles.</p>

Outcomes

- » The affordability analysis should present the information that allows decision-makers to assess if the reference project/s is affordable over the whole of its life.
- » Sources of existing funding, as well as additional funding from other sources, should be well investigated and analysed.

B12 Appraisal summary table

Purpose

The appraisal summary table (AST) provides an overarching summary of the analyses in Section B.



The AST approach has been adopted from the UK Transport Analysis Guidance (2013) and ATAP (2018).

Considerations

An AST is a summary of key consequences relating to the environmental, financial, economic and social impacts of the proposal.

Consider using the AST as a key communication tool for the executive summary and/or the business case conclusions or recommendations.

Content to include

The AST should include the elements outlined in Table 22 below.

Table 22: Appraisal summary

	IMPACT DESCRIPTION	SUMMARY OF KEY IMPACTS	QUANTITATIVE IMPACTS	QUALITATIVE SHORT-TERM IMPACTS	QUALITATIVE MEDIUM-TERM IMPACTS	QUALITATIVE LONG-TERM IMPACTS	IMPACT/VALUE
Environmental	Short description of the environmental impact/s	Describe the results of the impact	Describe the quantitative assessment of the impact	Describe any qualitative assessment of the impact	Describe the qualitative assessment of medium-term impacts	Describe the qualitative assessment of long-term impacts	Describe the environmental impact risks
Economic	Short description of the economic impact/s	Describe the results of the impact	Describe the quantitative assessment of the impact	Describe any qualitative assessment of the impact	Describe the qualitative assessment of medium-term impacts	Describe the qualitative assessment of long-term impacts	Net present value (NPV) Benefit cost ratio (BCR) Internal rate of return (IRR)
Financial	Short description of the financial impact/s	Describe the results of the impact	Describe the quantitative assessment of the impact	Describe any qualitative assessment of the impact	Describe the qualitative assessment of medium-term impacts	Describe the qualitative assessment of long-term impacts	\$xxm
Social	Short description of the social impact/s	Describe the results of the impact	Describe the quantitative assessment of the impact	Describe any qualitative assessment of the impact	Describe the qualitative assessment of medium-term impacts	Describe the qualitative assessment of long-term impacts	Describe the social impact risks

Outcomes

The AST clearly articulates the highlights of all appraisals/assessments.

Health check B

#	HAVE YOU COMPLETED THE FOLLOWING?	SECTION	COMPLETED
1	Provided a comprehensive review of the reference project/s, documenting the scope and objectives, the outcomes and benefits expected and any changes from previous work i.e. Stage 1: Strategic Assessment and Stage 2: Options Analysis	B3	<input type="checkbox"/>
2	Captured discussions around the alignment/misalignment of the reference project/s with all relevant government policy, programs and initiatives, and discussed the impact for the proposal	B3	<input type="checkbox"/>
3	Documented all policies, standards, approvals (including whether seeking planning approval through a Ministerial Infrastructure Designation), legislations and regulations that are applicable to the reference project/s, and considered relevancy through a whole-of-life, whole-of-system lens from proposal inception and delivery to the ongoing/operational phase	B4	<input type="checkbox"/>
4	Documented potential impacts of the reference project/s on relevant areas of public interest including public access, equity, consumer rights, security and privacy	B5	<input type="checkbox"/>
5	Provided a completed sustainability assessment	B6	<input type="checkbox"/>
6	Documented the result of the proposal's social impact evaluation	B7	<input type="checkbox"/>
7	Provided a completed environmental assessment for the proposal, including identifying all potential environmental impacts and any mitigation strategies	B8	<input type="checkbox"/>
8	Provided a robust and transparent socio-economic analysis narrative and CBA, which has been assessed against Section 6.1 Quality and 6.2 Checklist in the CBA Guide, and adequately considered peer review feedback	B9	<input type="checkbox"/>
9	Provided a socio-economic analysis which has considered uncertainty, climate risk and resilience, including sensitivity and scenario analysis	B9	<input type="checkbox"/>
10	Provided a complete, robust, transparent and accurate financial assessment for the reference project/s	B10	<input type="checkbox"/>
11	Provided a financial analysis detailing the level of design (or class) and showing it is fit for purpose according to the decision-maker's level of risk tolerance	B10	<input type="checkbox"/>
12	Provided detailed consideration for, and analysis of value creation and capture opportunities, and implications for proposal funding.	B10	<input type="checkbox"/>
13	Captured all relevant information to allow decision-makers to assess whether the project is an affordable option over its whole-of-life	B11	<input type="checkbox"/>
14	Documented any consultation with Queensland Treasury for assistance relating to the potential for private sector funding and/or financing	B11	<input type="checkbox"/>



Section C:
Delivery

Purpose

Section C: Delivery provides details of the intended delivery and implementation approach as outlined in Figure 6.

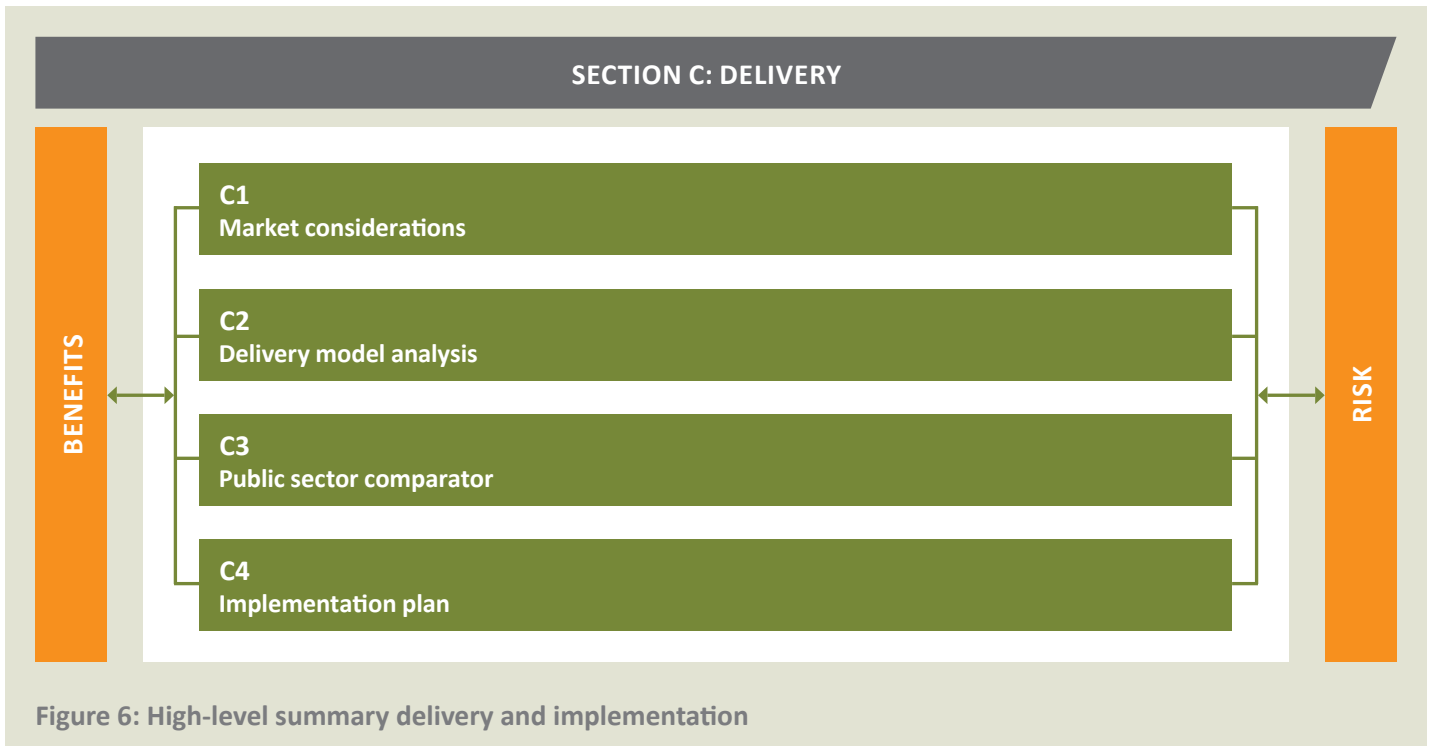


Figure 6: High-level summary delivery and implementation

C1 Market considerations

Purpose

This section supports:

- » the investment decision-making process
- » the development of a procurement strategy
- » the identification of opportunities and risks related to the procurement process.

Considerations

As the level of private sector involvement varies considerably between projects, information should be sought from the private sector concerning the proposal. This may include:

- » market information regarding market risk appetite, availability of contractors and any other major projects that may compete for resources
- » potential delivery models and issues concerning the project from an industry perspective
- » project feasibility, appetite/attractiveness and risk sharing
- » feedback on matters such as project scope and specification, and any opportunities for design and construction innovation.

Where the reference project/s is highly sensitive to assumptions about the attractiveness, likely involvement of the private sector and the terms on which that involvement might occur, those assumptions should be validated through market sounding.

- » Market sounding during proposal development builds upon and provides more detail than Stage 2: Options Analysis. It also identifies any changes or impacts in the market since Stage 2: Options Analysis completion.
- » Subject to the type of project, market sounding may be required to capture the design phase to increase its effectiveness.
- » Information provided by the market should be critically evaluated if there is different or inconsistent feedback and response. Care must be taken to ensure participant expectations regarding project implementation and options are managed appropriately and with due regard for probity.
- » Market consideration activities may include documenting the results of a desktop review undertaken prior to, and supporting, the market sounding activities.



Market sounding can also be used to gain feedback on ways to present the proposal to the market to increase its attractiveness and reduce obstacles. Queensland Treasury can assist with the development of a Market Sounding Plan if required.



Where there are multiple projects that draw on the same market and resources, the proposal should seek to outline potential interfaces between them and the resulting impact (i.e. strained market capacity or potential for staged development).

Content to include

This section should include content as outlined in Table 23 below.

Table 23: Market considerations

CONTENT	CONSIDERATIONS
Market sounding objectives	<p>Market sounding refers to the collection of activities to determine the market’s appetite for involvement in the project and/or explore possible solutions. Document the objectives for market sounding for the reference project/s. They may include:</p> <ul style="list-style-type: none"> » obtaining market information including risk appetite and the availability of contractors » acquiring feedback on matters such as project scope and specification, the opportunity for design and construction innovation, timeliness for the bidding process and bidder selection criteria » providing information to the market e.g. on project requirements.
Market sounding approach	<p>For the Stage 3: Detailed Business Case this may involve detailed desktop market sounding of trends and issues including formal requests for information. In some cases, this will involve conducting formal market sounding processes using structured engagement with industry.</p> <p>As market sounding should focus on the private sector as a whole rather than on any individual company, structured engagement requires careful consideration regarding which companies and industry groups to approach.</p> <p>Planning and structuring the engagement is important to minimise the risks of providing information to companies which may give them an unfair advantage during any future procurement processes. A clear probity protocol is required to assist in managing such risks. Probity protocols should not prevent discussions with the market but they should ensure care is exercised so no company has, or is perceived to have, received or provided information that offers them an unfair advantage in any subsequent procurement process.</p>
Market feedback	<p>Feedback typically includes:</p> <ul style="list-style-type: none"> » feedback on options and risk allocation » market preference on size and staging (work packages).
Assessment of market capability	<p>Consider the market capability and interest in the project including delivery or financing options. This should include local market engagement during options analysis development as well as delivery.</p> <p>Where the local market is to be targeted during delivery, this should be reflected in the economic and financial analyses.</p> <p>Information from this section is used to inform the financial and risk assessment sections.</p>

Outcomes

Document key market feedback information including risk, market capability and other considerations which will inform reference design, deliverability assessment, environmental assessment, the social impact evaluation, the risk assessment and the project cost estimates.

C2 Delivery model analysis

Purpose

This section evaluates potential delivery models and recommends one that is likely to optimise value-for-money in delivering the investment. The analysis will also consider packaging options for the delivery including development of private finance models (as appropriate). The objective of the assessment is to identify a delivery model that is likely to provide the best value-for-money in meeting the identified service need.

Considerations

Treasury's Project Assessment Framework mandates that in all circumstances private sector procurement must be considered for all proposed investments with an expected capital cost greater than \$100 million. This consideration is facilitated through the delivery model analysis.

You can find further guidance on undertaking a value-for-money assessment in the Project Assessment Framework (PAF) and the National PPP Guidelines. Workshops will be needed to explore the detailed assessment required to evaluate the delivery model, including packaging considerations.

The delivery model analysis should consist of the following multiple stages:

- » Source and analyse data needed to undertake the evaluation, including proposal objectives and requirements, risks, option characteristics e.g. design, operations, agency capability and market sounding analysis. You will need to develop detailed data to reach an informed evaluation of potential benefits.
- » Evaluate packaging to decide which elements of the investment should be included or excluded in the evaluation e.g. operations and maintenance. Also evaluate whether to break up construction into separate packages e.g. rail, road, signalling, etc. (Workshop 1).
- » The analysis should detail supporting evidence, analysis and rationale. Issues to consider include:
 - › brownfield versus greenfield infrastructure
 - › discrete elements of procurement
 - › easily separable portions of work e.g. geographically
 - › analysis of risks and interface issues
 - › operating environment
 - › site accessibility
 - › staging opportunities and requirements.



Engage Queensland Treasury at the earliest possible stage in the business case process to explore options for private sector funding and/or financing.

- » Evaluate whether private finance models are suitable to procure the investment. As part of this evaluation consider:
 - › the ability to derive output-based specification
 - › risk allocation between government and private sector providers
 - › efficiency cost benefits
 - › revenue opportunities
 - › market appetite and interest
 - › potential for innovative solutions.
- » Develop qualitative criteria and associated weightings for the delivery model evaluation.
- » Shortlist delivery models for evaluation by considering:
 - › proposal objectives
 - › agency capability
 - › efficiency cost benefits
 - › characteristics of the procurement model e.g. inclusion or exclusion of operations, similar investments locally that set a precedent, comparable projects across other jurisdictions and industries, and relevant historical experience.
- » Determine appropriate cost criteria and associated weightings consistent with relevant guidelines.
- » Undertake your evaluation in line with relevant guidelines to justify the preferred procurement approach.
- » Undertake additional checks to confirm the preferred procurement model. These checks could include a sensitivity analysis and engaging the market to confirm interest, capability and availability.

The analysis should use value-for-money criteria to assess whether potential private financial procurement models could generate value for the state.

Each potential procurement model should include some form of private financing to fund infrastructure construction, and should consider other variants of ownership, maintenance and operations.

Traditional delivery model

Traditional delivery models may include those listed in Table 24.

Table 24: Traditional delivery models

1	Design and construct including early contractor involvement and early tenderer involvement
2	Design, construct and maintain
3	Design, construct, maintain and operate
4	Alliance/competitive alliance
5	Managing contractor

Engage those with the experience and professional judgement to help select the most relevant delivery models to evaluate. Not all of these delivery models may be suitable for the specific circumstances. Other delivery models may be evaluated instead or in addition to these options.

Private finance delivery model assessment

A private finance arrangement is a risk-sharing relationship between the public and private sectors to deliver public infrastructure (and associated services) with a component of private sector finance.

Value-for-money

Value-for-money drivers may include:

- » project scale
- » risk allocation
- » whole-of-life costing
- » innovation
- » improved asset utilisation
- » economies of scale
- » competitive process.

You should undertake the value-for-money evaluation using a multi-criteria analysis. The analysis should detail supporting evidence and rationale including the following:

- » your ability or otherwise to develop an output-based specification covering defined requirements and performance indicators (justify your rationale for being able to achieve this)
- » how you have evaluated risk allocation between government and the private sector. Show:
 - » details of the expected risks, analysing which party is best placed to manage those risks to determine the optimal risk transfer
 - » your assessment of cost certainty and the likelihood of variations or scope creep
 - » whether private finance can cost risks efficiently, including an evaluation of the risk premium needed to transfer these risks.
- » evaluation of potential cost efficiency benefits detailing what bundling benefits are expected and why those benefits are expected e.g. substantive operating cost relative to the capital cost
- » evaluation of all potential revenue opportunities that could be developed to offset the expected capital and operating costs
- » assessment of the market appetite, interest and ability to undertake the proposed investment. You need detailed evidence to support this assessment
- » investigation of innovative and creative solutions to meet the investment objectives.

Other factors you need to evaluate include the contract term and the benefits of developing on a holistic basis e.g. coupling infrastructure construction with maintenance.

Content to include

Undertake the delivery model analysis in line with the approach below, which evaluates the preferred delivery model using a five step process. The evaluation should involve a number of workshops (at least two but could be up to four). Workshops should include:

- » internal government stakeholders with extensive knowledge of the proposal and of the construction, maintenance and operational environment
- » experienced and skilled advisors (where appropriate)
- » external consultants with private equity and private sector construction, maintenance and operational experience in the relevant industry.

STEP 1. DATA

Gather and analyse data to cover the following areas:

- » Confirm the proposal objectives i.e. service need or opportunity (the objectives need to be adequately defined to determine whether the delivery model will affect their achievement).
- » Confirm the proposal requirements (needed to inform market sounding).
- » Confirm proposal characteristics (needed to both inform market sounding and to evaluate whether delivery models will be affected). Evaluate the potential for innovation in design, delivery, operation and maintenance, and whether the proposal has easily definable output requirements that could have performance measures.
- » Undertake a transparent and independent evaluation of whether your agency (with its network of personnel, skills, systems etc.) can manage the proposal's implementation across the different delivery model alternatives e.g. does the agency have the capability to undertake a Public Private Partnership?
- » Revisit your market analysis for each stage of evaluation e.g. pre-feasibility options analysis (initial discussions), feasibility, detailed business case (preferred proposal) and procurement development.
- » Undertake a detailed risk assessment for all investment risks, such as financial, legal, technical, design, environmental, social, etc. Each risk should be quantified (where possible) to allow an understanding of the expected costs if delivery is retained by government or transferred to the private sector under an alternative delivery model.

- » Undertake a detailed evaluation of the whole-of-life costings to understand:
 - › packaging
 - › build and maintenance dependencies and synergies
 - › capital versus operating costs
 - › lifecycle management for the proposal
 - › whether there are opportunities for cost savings under different delivery model alternatives.
- » Undertake a packaging evaluation to determine which elements of the investment should be included in the delivery model evaluation and which should be sourced independently (usually through government). The packaging evaluation should also analyse in detail whether multiple construction packages would be suitable.
- » Undertake all analysis necessary to inform economic evaluation of outcomes under different delivery models.
- » Investigate whether the proposal has scope to generate additional revenue streams.
- » Determine the likely number of bidders for the proposal through market sounding.
- » Undertake preliminary, detailed legal assessments on whether a long term contract is suitable for the proposal.

STEP 2. SHORTLISTING

Shortlist a selection of delivery model alternatives (Workshop 1) using data gathered and analysis undertaken in step 1. Focus on the following for each delivery model:

- » ability to fully deliver the proposal objectives
- » suitability e.g. brownfield versus greenfield
- » existing and proposed operating environment
- » proposal recurrent budget or capital funding constraints
- » operating model e.g. government-managed services
- » split between capital, operating, and maintenance costs
- » agency capabilities
- » market appetite.

STEP 3. VALIDATION

Validate your shortlisted alternatives by:

- » comparing your analysis to previous investments delivered in different jurisdictions, noting any differences that would be relevant to your selection of preferred delivery model alternatives
- » reviewing lessons learnt that have particular relevance to the current proposal
- » checking any structural or market changes e.g. market preference for availability structures, interest rate environment
- » market sounding feedback.

STEP 4. ANALYSIS

This step analyses the delivery models for the shortlisted alternatives (Workshop 2).

You should determine appropriate criteria for the analysis and allocate weightings based on each criteria's likely effect on achieving value-for-money. The same criteria and weighting should be applied to each shortlisted delivery model alternative.

The delivery model analysis should be used consistently whatever type of delivery models are shortlisted i.e. whether they are only private finance, traditional or a combination.

Value-for-money is determined by considering benefits relative to costs. A delivery model choice can affect both the expected benefits and costs. Your delivery model evaluation should consider both the likely range of cost outcomes (financial) and likely range of benefit outcomes (financial and non-financial). Non-financial outcomes can be assessed using techniques such as economic and social evaluations.

The delivery model assessment should be focused on determining which alternative is likely to generate the highest value-for-money outcome for the state. Value-for-money is assessed using:

- » Financial evaluations—focus on the costs to the state that will affect the state's cashflow profile, such as capital and operating costs.
 - › This category will also evaluate cost offsets such as revenue opportunities associated with different delivery models.
- » Non-financial evaluations—focus on economic, social and environmental benefits that could be achieved with different delivery models.
 - › This category should consider both disadvantages and costs e.g. noise, and advantages such as better quality of life.

To establish the cost and quality criteria, break down criteria into the maximum number of sub-criteria that are relevant and can be evaluated. Each sub-criterion should then be weighted based on its impact on value-for-money outcomes.

- » The total weightings of all sub-criteria (cost and quality) should add up to 100 per cent.
- » The weighting split between cost and quality should be based on the type of project.
- » The importance of the qualitative criteria and their effect on value-for-money should be used to decide an appropriate weighting e.g. low non-financial values might represent 20 per cent of the weighting.

Only criteria that are relevant to outcomes for all delivery models should be included in the assessment. If impacts are minimal, inconclusive or similar for all delivery models, exclude that criterion from the assessment.

Trade-offs between outcomes will become obvious in evaluating the alternative delivery models. It is unlikely that one model will score highly in all categories. For example, a high level of state control will potentially reduce opportunities for innovation, or a constrained timeframe for delivery may increase cost. Consider the relative priority of the proposal's targeted objectives and outcomes when setting the criteria and weightings.

COST

A criterion should only be included in the cost category where it will affect the expected cost of delivery (design, construction, maintenance and operation). All qualitative criteria should be assessed in the quality category. A cost should also only be included where it is expected to be different in the different delivery model alternatives e.g. innovation in different delivery models may change construction costs, operational costs, maintenance costs or financing costs.

The relative weighting of each sub-category should also take into account its comparative value over the investment horizon of the proposal i.e. transaction costs relative to whole-of-life costs.

Example cost categories may include:

- » capital costs (vary due to different competitive tension in delivery model alternatives)
- » operating costs (should only be included where at least one delivery model includes an operating component)
- » maintenance costs (should only be included where at least one delivery model includes a maintenance component)
- » transaction costs (should only be included if the cost for one delivery model is substantially different from the other delivery models). If transaction costs are insignificant, they should be excluded
- » risk of cost variation (only include this when the total risk can be quantified and where the optimal risk allocation for one delivery model is substantially different to the other delivery models). Individual risks should only be assessed where one or more delivery models achieves optimal risk allocation at a significantly lower cost compared to other models
- » other e.g. cost of environmental offsets.

All cost categories must be evaluated over the same investment horizon.

QUALITY

The qualitative criteria will be determined by the type of investment. Only qualitative criteria that significantly affect non-financial outcomes should be included in the assessment. For each qualitative criterion assessed, clearly explain its link to the investment's objectives and non-financial outcomes e.g. social. Consider the following:

- » Level of service: to maintain level of service at or above minimum service standard over the economic life of the investment. This is unlikely to apply where delivery models do not include operations and maintenance.
 - › Only include this criterion where one delivery model is expected to provide a higher level of service compared to others. The level of service can be broken down into multiple sub-categories as needed.
- » Innovation: to improve investment non-financial outcomes through innovative solutions.
 - › Only include this criterion where one delivery model is expected to include innovative solutions that lead to better non-financial outcomes compared to other delivery models.
- » Timing: to complete investment to align with a non-negotiable date or event. Note that deferring the timing may generate considerable financial and non-financial benefits.
 - › Only include this quality category if the economic assessment shows that an early start will give significant advantages and if one of the delivery models achieves a worthwhile time difference.
- » Environment: to minimise environmental impacts.
 - › Only include this criterion where one delivery model is expected to achieve better environmental solutions than others.
- » Equity: to improve equity through improved public accessibility, consumer rights and security.
 - › Only include this criterion where one delivery model is expected to achieve better equity outcomes than others.
- » Sustainability: to achieve sustainability over the investment's economic life. This includes assessing whether the delivery models will use resources and energy effectively while achieving social returns for stakeholders.
 - › Only include this criterion where one delivery model is expected to achieve better sustainability outcomes than others.
- » Economic externalities: to minimise negative externalities and enhance positive externalities for stakeholders, including how delivery models will perform for factors such as noise and pollution.
 - › Only include this criterion where one delivery model is expected to achieve better economic outcomes than others.
- » Flexibility: where a proposal's operations are either not suited to a long term contract or the output requirements are uncertain. In these cases, flexibility may be needed to undertake modifications over the contract term or flexibility of the operational phase contractual period. In these cases, flexibility would be a valid criterion for evaluation.

Decide on criteria weightings based on their effect on achieving value-for-money across all delivery models. You can use mathematical approaches such as Rank Order Centroid, Pairwise or Swing Weighting to set better weightings. Whichever method you use for weightings, you should have sufficient justification and rationale for each weighting from the analysis and evidence developed during Step 1.

STEP 5. EVALUATE

Develop a tool for multi-criteria analysis (such as Multi-Attribute Utility Theory) to evaluate and rank the delivery model alternatives.

Develop a spreadsheet or similar tool to undertake the evaluation (Workshop 3).

Score each criterion, either on a relative basis to each other or on an absolute achievement basis. Get each participant to score each criterion independently, first to gather diversity of opinion, then invite comprehensive discussion to find scoring consensus.

- » Each score should go through an iterative process and sense checking.
- » Scores must be justified and have a supporting rationale given (preferably sourced from Step 1).
- » Spreadsheets and supporting rationale should be circulated to participants for final consultation and modification.
- » Use resulting scores to identify and rank preferred delivery model/s.

Outcomes

- » The delivery model analysis evaluates procurement models and recommends one that is likely to optimise value-for-money in delivering the investment.
- » The analysis considers packaging options for the procurement as well as development of private finance models (as appropriate).



Where the recommended delivery option is a PPP with private finance, report the outcomes of the assessment (including the preferred PPP delivery model) in accordance with the National PPP Guidelines and the Queensland Treasury, Project Assessment Framework (PAF) PPP guidelines.

C3 Public sector comparator

Purpose

The Public Sector Comparator (PSC) is a financial model that estimates the most likely value of the proposal if it is delivered by the public sector using the most efficient method of government delivery. It forms the benchmark against which private sector bids, and delivery through PPP models, are compared.

Considerations

The PSC will estimate the risk-adjusted, whole-of-life cost of a project to the government using the most efficient and likely method of government delivery (most efficient traditional delivery method).

The PSC is limited to those components that would be in the scope of services for the private sector to include in its tender response. Accordingly, the PSC provides a like-for-like comparison with potential private sector bids.

Additional costs, which would be incurred by the state in procuring the reference project/s under a different delivery model, are not included in the PSC.

Content to include

The PSC should include content as outlined in Table 25 below.

Table 25: PSC content and considerations

CONTENT	CONSIDERATIONS
Approach	<p>Describe the analysis methodology adopted for establishing the PSC. The National PPP Policy methodology and PAF guidelines should be followed where a PPP delivery model is preferred. Considerations for the approach:</p> <ul style="list-style-type: none">» assumptions underlying the analysis i.e. duration, discount rate» key analysis inputs i.e. costs in nominal and present value form, risks, market sounding, financial analysis, delivery model and packaging» literature used to inform the assessment e.g. current issues and case studies on delivery of similar projects in Queensland and elsewhere» packaging opportunities and scenarios» project items not considered» criteria and measures for analysis including the importance of the criteria» evaluation and mitigation of risks.
Assessment	<p>Provide an overview of the PSC assessment, including the risk-adjusted financial net cost for the project over the whole of its life.</p>

Outcomes

The PSC should clearly articulate the most likely value of the reference project/s if it is delivered by the public sector using a traditional delivery model.

If a PPP is the outcome of the delivery model analysis, the PSC information should be consistent with that contained in the financial and affordability analysis section.

C4 Implementation plan

Purpose

The implementation plan outlines the proposed program for the delivery of the project.

Considerations

- » Level of detail to be commensurate with the size of the project and its associated risk.
- » When planning implementation, consider the organisation’s experience in delivering and managing projects of a similar nature, and the relevance of experience in line with the preferred delivery model.
- » Where appropriate, consider the relevant department’s governance and asset management framework.

Content to include

The implementation plan should include content as outlined in Table 26 below.

Table 26: Implementation plan content and considerations

SECTION	CONSIDERATIONS
Governance arrangements	<p>Outline the proposed governance arrangements for the implementation (procurement and delivery) phase including roles and responsibilities, and involvement of other agencies e.g. central agencies.</p> <p>Make note of any changes to governance arrangements during proposal development.</p>
Project management approach	<p>Document the development of project management plans.</p> <p>Develop the key project deliverables, milestones and approvals (including Ministerial Infrastructure Designations, if appropriate). Consider scope, timelines and responsibilities. For each milestone, identify the date and responsible person. Ensure it is clear what is within scope and what is out of it.</p>
Procurement strategy approach	<p>Document the development of the proposed procurement strategy. Develop the procurement strategy and its objective including:</p> <ul style="list-style-type: none">» the value-for-money from the procurement choice and the governance arrangements for managing the procurement (this should complement the description of governance arrangements identified above)» the market characteristics (as this may influence the method of procurement or who to procure from)» how the market is to be engaged (i.e. whether open tender or from a pre-qualified list of tenderers etc.)» an outline of the key steps and timing for developing and implementing the procurement method» an outline of the cost of procurement and the key risks and management methods» a statement of the capacity and resources of the agency to manage the procurement process as well as the agency’s responsibilities under the contract (may be included in the project plan).

SECTION	CONSIDERATIONS
Change management	<p>Describe the approach to managing organisational change throughout the project including:</p> <ul style="list-style-type: none"> » the effect implementation of the project will have on existing services, processes and people » how current business/work practices will be enhanced/improved and/or changed as a result of project implementation » legislation, policy and regulatory issues » the stakeholders who will be involved in the change management process including the agency, a business unit within an agency, other agencies (where there are cross-agency implications), service providers, users or recipients » the change management roles and responsibilities such as a change sponsor, change agents and the stakeholders who will need to alter their work practices » the communication strategies and plans to be developed as well as the training tools, processes or work methods » the mechanism to monitor and measure the effectiveness of the change management process.
Resource requirements	<p>Outline the skills and resource requirements for the project including:</p> <ul style="list-style-type: none"> » what resources are necessary to implement this project and realise the benefits » whether the necessary resources are available (considering the agency's current commitments and capacity to deliver) » the training requirements and how they will be addressed (where applicable).
Benefits realisation	<p>Document the development of a benefits realisation methodology for the project that:</p> <ul style="list-style-type: none"> » describes the benefits to be achieved » describes the contribution to agency service delivery » identifies the person responsible for implementation » describes what will be managed and measured during implementation to ensure the objectives and/or benefits are achieved » tracks whether the project is being implemented in a way that gives assurance the benefits will be achieved (including a set of measurable KPIs that link to the post-implementation benefits) » identifies the performance measure or service level before and after the change » identifies target date/s for the objectives and/or benefit to be implemented or realised » develops a benefits profile.

Outcomes

The implementation plan section should clearly articulate timing, approval processes (including timing associated with seeking a Ministerial Infrastructure Designation, if relevant), stakeholder engagement and communications, and the procurement strategy.



Detailed supporting documentation (i.e. project management plan, procurement strategy and change management plan) can be submitted as an appendix(ces) to the Stage 3: Detailed Business Case.

Conclusions

Purpose

This section draws together the key findings from:

- » Section A – Proposal context
- » Section B – Considerations and findings
- » Section C – Delivery.

Considerations

Clearly articulate the analysis of the social, economic, financial and environmental merit of the proposal including how it meets the service need and delivers quadruple bottom-line (economic, social, environmental and financial) outcomes.

Summarise key issues that may impact the delivery of the project and its benefits.

Outcomes

Your conclusions should clearly articulate and draw together the key findings from Sections A, B and C.

Document key conclusions drawn from the following analyses (where relevant):

- » strategic (government level issues/risks, legislative issues)
- » economics
- » financial/commercial
- » sustainability
- » social
- » environmental
- » deliverability including the high-level outcomes from the market sounding
- » affordability—discuss the project’s affordability and value-for-money taking into consideration the estimates of benefits and costs, depth of technical investigations, sensitivity analysis, market sounding and recommended procurement strategy
- » any implementation issues including approvals and timeframes.



Recommendations

Purpose

This section clearly outlines the actions which need further consideration by the decision-maker.

Considerations

- » Justify the basis on which the proposal proceeds, incorporating all the considerations in Sections B and C but particularly the socio-economic viability as outlined in Section B9: Economic analysis.
- » If the recommendation is to proceed (i.e. it is viable), summarise the reference project identified to progress to procurement.
- » Summarise the recommended delivery option for the project.
- » Finalise the benefit and risk registers and make note of any possible future risk and benefits actions/activities.
- » If the recommendation is to proceed to procurement, this section also:
 - › seeks approval for the implementation plan (and associated documents)
 - › highlights significant issues or risks (if appropriate)
 - › includes recommendations regarding optimal timing.
- » Areas typically requiring recommendations include:
 - › the viability of the proposal (economic, social, environmental, financial, affordability and commercial) including, as appropriate, endorsement of the reference project or alternatives
 - › progression to procurement and approval of the implementation plan, where appropriate key activities/ thresholds to achieve prior to the project going ahead
 - › identification of significant issues, analysis limitations or risks
 - › key timeframes, timing and governance arrangements.
- » Where the outcome of the detailed business case concludes that a non-infrastructure preferred option/s is to progress, the executive summary should include recommendations regarding the governance arrangements, oversight and ownership of the proposal moving forward.



Well-formed recommendations support government decision-making, provide transparency and support smooth implementation.

Outcomes

- » The recommendations section will:
 - › clearly note the proposal outcome i.e. whether the reference project is viable, rejected or modified
 - › clearly outline the actions required by the investment decision-maker.

Health check C

#	HAVE YOU COMPLETED THE FOLLOWING?	SECTION	COMPLETED
1	Documented the impacts of market considerations and how they have been reflected in the deliverability assessment, environmental assessment, the social impact evaluation, the risk assessment and the project cost estimates	C1	<input type="checkbox"/>
2	Captured an overview of the proposal's market considerations activities, including relevant research and market sounding activities	C1	<input type="checkbox"/>
3	Outlined a recommended delivery model for the reference project/s that provides decision-makers assurance of a value-for-money outcome to consider the project further for investment	C2	<input type="checkbox"/>
4	Provided an overview of the PSC assessment and its outcome	C3	<input type="checkbox"/>
5	Provided an overview of the implementation plan	C4	<input type="checkbox"/>
6	Documented the business case conclusions		<input type="checkbox"/>
7	Documented the business case recommendations		<input type="checkbox"/>
8	Documented all references for the Stage 3: Detailed Business Case		<input type="checkbox"/>
9	Provided a succinct executive summary that considers a high-level overview of the results of the Stage 3: Detailed Business Case assessments and is an appropriate length for the intended audience		<input type="checkbox"/>

Glossary

Benefit	<p>A measurable improvement resulting from an investment perceived as an advantage by one or more stakeholders.</p> <p>Benefits might initially be stated in terms of the outcomes sought in response to a problem/opportunity. Then they are refined in terms of potential benefits that will occur from one or more options.</p>
Benefits management	<p>The identification, definition, monitoring, optimisation and realisation of benefits.</p> <p>Benefits management is a whole-of-life, whole-of-system process.</p> <p>Benefits management involves measurable improvement resulting from the investment in the potential option and contributes to one or more objectives sought by an agency or government.</p>
BCDF	The Queensland Government Business Case Development Framework
Disbenefit	An adverse impact illustrated through a measurable decline resulting from a negative consequence of implementing a particular solution.
Outcome	The result of change, normally affecting real world behaviour ⁴ .
PAF	Queensland Government Project Assessment Framework
PPP	Public Private Partnership
Stage 1: Strategic Assessment	Previously referred to as Strategic Business Case
Stage 2: Options Analysis	Previously referred to as Preliminary Business Case

⁴ UK Office of Government and Commerce definition

Appendix 1: BCDF sustainability assessment: approach and templates

Approach

A sustainability assessment supports an understanding of the quadruple bottom line (economic, social, environmental and financial) impacts and opportunities of the project, not just its financial performance. The lens through which the assessment is completed at this stage in the project lifecycle is primarily a sustainability impact view.

The sustainability assessment is considered up-front in the business case development. It is undertaken in conjunction with the risk evaluation as it will influence the understanding and assessment of project risk. The approach to the assessment leverages work done by the proposal owner to date and either of the two sustainability assessment tools developed for the Queensland Government in collaboration with peak sustainability bodies:

- » the Infrastructure Sustainability (IS) rating scheme themes and categories developed in collaboration with the Infrastructure Sustainability Council—for linear infrastructure
- » the Green Star sustainability principles, themes and categories developed in collaboration with the Green Building Council of Australia—for buildings.

The approach to the assessment may include the following steps:

1. **Evaluate** the principles contained in the sustainability assessment approach (Section B6: Sustainability assessment) for relevance to the project. Not all of the principles may be appropriate.
2. **Identify** the broad suite of stakeholders, their interests and drivers and the reference project's impact on them (drawing information from the environment and social impact sections of the Stage 3: Detailed Business Case and from prior Stage 1: Strategic Assessment and Stage 2: Options Analysis).
3. **Conduct** a workshop involving people with diverse expertise to apply the sustainability framework and develop innovative approaches to all relevant principles. The workshop should take a holistic, long-term and integrated perspective. Ahead of the workshop:
 - » **Develop** questions for selected principles. The questions for each principle are an important guide for the issues to be addressed. However, the project type, location, context and issues may suggest alternative or additional questions.
 - » **Identify** any principles that are not relevant to the proposal. Indicate these in the assessment format with an accompanying justification of why the principle is not relevant. A level of achievement is not required in these cases.

4. **Facilitate** the workshop to:

- » examine the wider system and the significant connections or relationships for the proposal
- » identify the most important drivers of change (e.g. 10–30 years into the future) and their implications for the project
- » identify the broad suite of stakeholders, their interests, drivers and likely impacts/outcomes
- » confirm any principles that are not relevant to the project
- » use the guiding questions to direct thinking and develop solutions that are innovative, lasting and result in multiple benefits. Integrated solutions are likely to have environmental, social and economic benefits, or benefits across several principles
- » challenge the project team to go beyond a BAU response when developing solutions and to avoid a narrow approach or one that only focuses on risk and overlooks opportunities.

5. **Following** the workshop:

The level to which each principle has been fulfilled should be indicated in the assessment format template:

- » Unless already captured in the assessments in Sections (B7: SIE, B8: Environmental assessment or B9: Economic analysis), the impacts of significant sustainability issues rated poor, compliant or basic should be reflected in the risk assessment where appropriate and, if required, subsequently in the project cost estimates.
- » Unless already captured in Sections (B7: SIE, B8: Environmental assessment or B9: Economic analysis), incorporate impacts identified in the sustainability assessment that can be monetised in the CBA in Section B9.
- » Unless already captured in Sections (B7: SIE, B8: Environmental assessment or B9: Economic analysis), social or environmental impacts that cannot be monetised should be incorporated into the SIE.
- » An overall achievement level across the principles (advanced, moderate, basic, compliant or poor) should be assigned and reported (refer Table 27).

Principles covered in this sustainability assessment are included in Table 12: ISC sustainability assessment principles—linear infrastructure or Table 13: GBCA sustainability assessment principles—buildings.

A description and guiding questions for the principles are included in the sustainability assessment tool in Table 28: Sustainability assessment (applicable to all infrastructure) or Table: 29 Sustainability assessment (building specific).

Queensland Government sustainability assessment templates

Document the results of undertaking the sustainability assessment in the applicable template using the rating levels presented in Table 27: Sustainability assessment rating, noting that an 'advanced level' implies global best practice. Outline information sources and/or sections of the business case or supporting documentation that you have used to undertake the assessment.

The information and evidence you present for each principle must substantiate this assessment and be concise but include sufficient detail to demonstrate the key elements and benefits of the approach.

Table 27: Sustainability assessment rating

SUSTAINABILITY ASSESSMENT RATING	
LEVEL	CRITERIA
Advanced	<ul style="list-style-type: none"> » Generates significant additional value and new opportunities not previously evident, such as changing a liability into an asset. » 'Designs out' the problem upfront rather than relying on managing impacts later. » Solutions generate flow-on benefits outside the project boundary.
Moderate	<ul style="list-style-type: none"> » Solutions to significant issues result in multiple benefits through economic, social and/or environmental outcomes. » Meets immediate community and user needs and will be resilient and efficient into the future. » Significant innovation and leading practice incorporated into the project.
<p>It is assumed that all projects will meet this level. Sustainable solutions are therefore expected to go beyond legislative and regulatory compliance.</p>	
Basic	<ul style="list-style-type: none"> » Avoids harm and negative effects. » Solutions create project efficiencies. » Solutions have an immediate or short-term focus.
Compliant	<ul style="list-style-type: none"> » Meets legislative and regulatory requirements.
Poor	<ul style="list-style-type: none"> » Fails to meet legislative and regulatory standards. » Solutions may result in disbenefits and negative effects.

Increasing project sustainability ↑

Sustainability Assessment Template—All Infrastructure

The [Infrastructure Sustainability Council \(ISC\)](#) defines infrastructure sustainability as: ‘Infrastructure that is designed, constructed and operated to optimise environmental, social and economic outcomes of the long term’. This template is preferred for transport, utilities and other linear infrastructure (e.g. roads, rail, pipelines, energy networks and renewable energy assets).

ISC’s Infrastructure Rating scheme and overarching framework is aligned to the United Nation’s Sustainable Development Goals. The accreditation scheme is intended to increase stakeholder awareness of key sustainability issues and provide organisations with a structured approach for improvement.

An overview of the principles considered in this assessment are included in Table 12: ISC sustainability assessment principles—linear infrastructure. A description and guiding questions for the principles are included in the sustainability assessment tool (Table 28: Sustainability assessment (applicable to all infrastructure)).

Table 28: Sustainability assessment (applicable to all infrastructure)

SUSTAINABILITY ASSESSMENT	
Demonstrate how the project fulfils the following sustainability principles	Achievement level: (indicate level achieved) Advanced, moderate, basic, compliant, or poor.
<p>Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available. Information should be succinct (dot points encouraged) and no more than a half page per principle.</p>	
GOVERNANCE	
<p>1 Context</p> <p>All infrastructure projects sit within a broader context and should be planned, designed and operated to connect with the wider system, including other infrastructure, economic activity, landscapes, population hubs and movements, flows of resources, materials, goods and people. This could occur at neighbourhood, town, city, region or state level.</p> <ul style="list-style-type: none"> » What is the service need being addressed by this project? Have social, environmental and economic issues been considered? » How will the project solve the identified service need and in what timeframe? How does it align with departmental and/or state goals and objectives? » What are the key elements, interrelationships and interdependencies of the wider system or network for this project that are fundamental to its long-term effectiveness? » How will the project integrate with, or respond to, these elements? » Has a strategic merit test been conducted to demonstrate the project objectives align with the strategic priorities set out in the relevant infrastructure and land use plans? 	
<p>2 Leadership and management</p> <p>The leadership team is responsible for implementing, measuring and reporting on the sustainability performance as well as creating a culture of innovation and knowledge sharing.</p> <ul style="list-style-type: none"> » How will this project engage a committed leadership team to embed sustainability into the planning, design, building and operation of this infrastructure project? » Has a materiality assessment been undertaken with internal stakeholders to identify the material sustainability topics? Have you included assessment of direct and indirect governance, economic, environmental and social risks and opportunities? Describe your methodology and any standards referenced. » How will a culture of innovation be created across the project lifecycle and include both proponent and contractor? » How will knowledge and lessons be shared with the project team, other projects and the supply chain? How will lessons learnt from previous projects be incorporated? 	

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

3 Sustainable procurement

Procurement activities are important. They consider human rights, society and the environment creating positive social outcomes through procurement spend and processes.

- » How will sustainable procurement including human rights, society and the environment be incorporated into the project's procurement activities? For example, will social and environmental procurement targets be set? How will social and environmental criteria be incorporated into tender evaluation?
- » How will this project use procurement spend to create socially and environmentally beneficial outcomes e.g. the procurement of environmentally friendly products and services?
- » Prior to going to market, how will strategies or action plans for managing the material sustainability risks and/or opportunities of specific goods and/or services to be procured be agreed upon, in collaboration with key internal stakeholders?
- » How will the supply chain be prepared for the sustainability and innovation requirements of this project?
- » How will contract management and supplier reporting practices ensure sustainability is delivered?

4 Resilience

Design infrastructure as the solution to the identified service need, taking into consideration the strategic goals and objectives. Focus on long-term use and outcomes so that the infrastructure leaves a positive legacy. Consider adaptability to respond to future changes, challenges and trends.

- » How will the project respond to the most significant drivers of change over the next two decades (i.e. those with the greatest impact and most probable) including technological, demographic, political, environmental and economic trends?
- » What futures modelling has been undertaken and applied to the strategic planning of the asset? Have scenarios for alternative futures been considered? What methodologies or standards were applied in developing these scenarios?
- » Has a review of climate and natural hazard risks been completed using readily available and current data and climate change projections for all direct risks to the asset? Provide details of government data sets leveraged e.g. long paddock.
- » Has a multidisciplinary internal team identified and assessed climate and natural hazard direct risks, and selected treatment options? This could include a range of acute shocks and chronic stresses likely to impact the functionality of the identified asset and its delivery to the community it services.
- » Have the key interdependent physical assets and services within the city/town/community likely to be impacted been identified should the project asset lose functionality or be forced to operate at minimal capacity? E.g. impacts on vulnerable communities.
- » How has the project asset considered these interdependencies to futureproof the asset, the network functionality and community resilience?

5 Innovation

Contribution of the proposal to product innovation, process innovation, marketing innovation or organisational innovation.

- » How will the project lead in innovative technology or process, or contribute to broader market transformation towards sustainable development?

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

ENVIRONMENT

6 Energy and carbon

Materials used on the project have a low lifecycle impact and low toxicity. The proposal incorporates climate change mitigation by identifying infrastructure solutions that reduce global carbon emissions.

- » How will this project assess the materials used in terms of their environmental lifecycle impact and toxicity?
- » How will this proposal address climate change mitigations? What initiatives have been included to reduce the greenhouse gas emissions footprint for whole-of-life?
- » Has high-level modelling of carbon emissions and energy use for Scopes 1, 2 and 3 been completed for operational and construction impacts?

Scope 1 emissions are direct greenhouse gases (GHG) emissions occurring from sources that are owned or controlled by the project e.g. emissions from combustion in owned or controlled boilers, furnaces, vehicles, generators, etc. and emissions from chemical production in owned or controlled process equipment.

Scope 2 emissions accounts for GHG emissions from the generation of purchased electricity consumed by the project.

Scope 3 emissions are all other indirect emissions that are a consequence of the activities of the project but occur from sources not owned or controlled by the project.

7 Green infrastructure

Traditional infrastructure is replaced with natural processes to do the same job.

The term 'green infrastructure' refers to an interconnected network of landscape assets that is intertwined with engineered (grey) infrastructure and buildings (all the natural, semi-natural and artificial networks of multifunctional ecological systems within, around and between urban areas, at all spatial scales).

- » Describe the opportunities to replace traditional infrastructure (grey) with green infrastructure.
- » Has a green infrastructure plan, including targets and associated strategies, been developed for the project?
- » Has a member(s) of the management team been assigned responsibility for incorporating green infrastructure elements into the design?
- » How will ongoing maintenance and management of green infrastructure during construction and operation be addressed?

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

8 Environmental impacts

Manage adverse impacts of the project on the environment (noise, vibration, air quality, light pollution, or local habitat).

- » Will this project be located on previously disturbed land? How will the impacts to habitat be limited?
- » Is the project compatible with the existing and future land use of the surrounding areas?
- » How have environmental impacts been baselined, goals identified and measures determined to mitigate impacts during construction and operations?

9 Resources

Use resources efficiently and responsibly. Reduce waste generated and increase re-use in construction and operation.

- » Has a resource efficiency workshop been held to define the strategy and performance expectations for the project?
- » How will this project manage waste and resource recovery? What are the waste management objectives and targets for the project?
- » What waste management and resource recovery initiatives are being implemented on this project?
- » How has the project considered end-of-life decommissioning to maximise resource re-use and recovery?

10 Water

Manage water consumption and discharge according to local conditions now and in the future.

- » Will this project use large amounts of water in construction and operation?
- » Is this project located in an area of water scarcity? If not, how will water scarcity in the future affect its construction and operation?
- » Will this project discharge water into sensitive environments during construction and/or operation?
- » Where the project discharges or uses water in sensitive environments, what are the operational water quality objectives for the asset? What initiatives have been incorporated into the project and asset to achieve water quality objectives during construction and/or operation?

11 Ecology

The local and regional habitat and ecology will be enhanced.

- » Has a preliminary ecological assessment (PEA) incorporating a desktop review been carried out by a suitably qualified professional for the infrastructure site (involving a site visit and incorporating an element of ground-truthing)?
- » How will this project improve ecology within the local region? E.g. what planning, design strategies and components have been incorporated into the project?
- » Will this project have residual impacts on critical natural capital (irreplaceable natural features, species, habitats etc.) that cannot feasibly be avoided, mitigated or offset?

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

SOCIAL

12 Stakeholder engagement

Understand and incorporate community and stakeholder views, including marginalised and affected groups, to increase the social licence to operate.

- » Has a stakeholder engagement strategy been developed which incorporates lessons learned? Is it informed by the local context and social risk assessment?
- » Has the strategy been integrated into the project?
- » How will marginalised and affected groups be included in the engagement?
- » How will community and stakeholder views be considered and incorporated into the decision-making processes throughout the project?

13 Legacy

Does the proposal have a strong positive social return on investment?

- » What will be the social return of this proposal? Describe how this proposal will benefit society (both locally and regionally) over the design life of the asset e.g. reduced travel times, increased wellbeing, improved air quality, increased social cohesion.
- » What is the legacy left behind beyond the project itself e.g. a bike path, enhanced community space, restoration of a heritage area etc?
- » Have initiatives to positively contribute to the environment or society for one priority issue or opportunity been implemented?
- » Who may be disadvantaged or made vulnerable through this project? How is this being addressed?

14 Heritage

Protect Indigenous and non-Indigenous heritage and sites highly valued by the community.

- » Has a broad assessment of heritage value been undertaken?
- » How will this project affect heritage sites or areas highly valued by the community?
- » How will opportunities to enhance heritage or mitigate adverse impacts be managed?

15 Workforce sustainability

Support and improve the lives of all employees including subcontractors of the infrastructure project.

- » Has a skills analysis been undertaken detailing relevant workforce capacity and capability requirements across all parts of the project lifecycle?
- » What actions are proposed to respond to identified skills gaps?
- » How will this project support and improve employee outcomes especially for marginalised and disadvantaged groups?

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

ECONOMIC

16 Options assessment and detailed business case

Make decisions based on the whole-of-life impacts and benefits of a project to the entity, the region and the state, including how the benefits and costs of infrastructure development are addressed in a fair and equitable way. Put a value on material externalities and incorporate them into the decision-making process.

- » Has a full range of options been considered including non-infrastructure solutions? E.g. were a range of strategic options developed and assessed to determine which is preferred, including at least one option to promote behavioural change or the use of existing assets?
- » Were strategic and subsequent project options evaluated by considering environmental, social and economic aspects through the use of a formal assessment technique?
- » Were whole-of-life costings adequately incorporated into financial and economic analyses for project options?
- » Has a weighted representation of the sustainability risks and opportunities of the preferred option been provided?
- » How will the whole-of-life impacts and benefits be incorporated into the project's ongoing decision-making processes?
- » What are the material externalities of this project (calculated over the whole-of-life of the asset)? How will they be valued (including monetised and non-monetised values) in the decision-making process?
- » Has there been consideration and evaluation of cost avoided as well as capital costs incurred?
- » Have sustainability strategies and initiatives been incorporated into the detailed business case estimate including third-party fees where applicable?

17 Benefits Realisation

Manage and realise benefits through construction and operations.

- » Has a benefits management plan including clear planning for high-level measurement of benefits been developed?
- » How are the benefits shared and has equity for stakeholders been considered?
- » Has sustainability been considered in the benefits realisation methodology including defining a future base case against which to measure these benefits? Has a baseline of business-as-usual (BAU) performance been established?
- » How will sustainability outcomes be quantified, monitored and evaluated throughout the project phases and lifetime of the asset?

Sustainability Assessment Template—All Buildings

The Green Building Council of Australia defines a green building as one that incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and occupants. Green buildings promote efficiency and can reduce construction and ongoing performance costs significantly. They are also known to deliver a suite of environmental and social benefits aligned with various government objectives to protect and enhance the natural environment and meet social needs. This template is preferred for buildings such as hospitals and schools.

This assessment template is based on the Green Star—Design and As Built rating scheme categories and credits, and was developed in collaboration with the Green Building Council of Australia. Green Star rating tools focus on built environment sustainability, aiming for long-term social, economic and environmental benefits during operation. This largely translates into reduced operating costs and greater comfort for end-users, as well as improved outcomes for the environment.

An overview of the principles considered in this assessment is included in Table 13: GBCA sustainability assessment principles—buildings. A description and guiding questions for the principles are also included in the Table 29: Sustainability assessment (building specific).

Table 29: Sustainability assessment (building specific)

SUSTAINABILITY ASSESSMENT	
<p>Demonstrate how the project fulfils the following sustainability principles</p> <p>Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available. Information should be succinct (dot points encouraged) and no more than a half page per principle.</p>	<p>Achievement level: (indicate level achieved)</p> <p>Advanced, moderate, basic, compliant, or poor.</p>
PROJECT SET UP AND MANAGEMENT	
<p>To ensure that positive sustainability outcomes can be achieved throughout design, construction and ongoing operation, all proposals should implement decision-making processes and strategies to ensure the project will be used to its full operational potential.</p> <ul style="list-style-type: none"> » How will the project facilitate coordinated approaches among cross-sectoral stakeholder interests? Consider: <ul style="list-style-type: none"> › Are there any existing processes to promote transparency, accountability, the inclusion and provision of information, and to provide for practical standards of responsibility and resource allocation? » How will the project commit to implementation and continual improvement? Consider: <ul style="list-style-type: none"> › Are there any existing policies/procedures that provide for practically enforceable standards of ownership, accountability and delivery? Are there existing mechanisms to enable performance evaluation, feedback and support? » How will the project promote sustainable cultures and behaviours among stakeholders? Consider: <ul style="list-style-type: none"> › Are there any existing policies/procedures that can raise awareness of the sustainability requirements of the project among stakeholders? What opportunities exist to enable more sustainable practices and continual improvement through data monitoring and information sharing? » How will the project verify its sustainability outcomes at the design, construction and operations phases? Consider: <ul style="list-style-type: none"> › Are there any mechanisms for independent verification being considered? What opportunities are there for tracking initial sustainability outcomes from concept through to construction? How are deliverables being monitored? 	

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

PROJECT SET UP AND MANAGEMENT

- » How will the project enable and provide for improved sustainability performance?
Consider:
 - › What are the opportunities for commissioning, handover and tuning initiatives to help ensure all building services operate to their full potential?
 - › How will the project develop resilience to the impacts of a changing climate and natural disasters?
 - › How will the project facilitate understanding of a building's systems, operation and maintenance requirements and environmental targets?
 - › What are the opportunities to encourage owners, occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way?
 - › What are the opportunities for effective energy and water metering and monitoring systems?
 - › What are the opportunities for the project to use best practice formal environmental management procedures during construction?
 - › How will the project seek to reduce operational waste?

INDOOR ENVIRONMENT QUALITY

Buildings are designed for people, and improvements in sustainability performance should not be made at the expense of comfort and wellbeing. A holistic approach to sustainability is achieved when initiatives that improve sustainability performance also improve occupant experience of the space through the indoor environment quality.

- » How will the project seek to enhance occupant comfort and wellbeing?
Consider:
 - › How will the project ensure healthy environments?
 - › How does the project provide high levels of thermal comfort?
 - › How will the project provide high air quality to occupants?
 - › How will the project provide appropriate and comfortable acoustic conditions for occupants?
 - › How will the project provide lighting comfort to users?
 - › How will the project support well-lit spaces that provide high levels of visual comfort to occupants?
- » How will the project ensure low-toxicity environments? Consider:
 - › How does the project safeguard occupant health through the reduction in internal air pollutant levels?

ENERGY

Buildings that are designed and constructed to reduce overall energy consumption deliver reduced greenhouse gas emissions, lower energy demand and less operating costs for building owners and occupants. Energy consumption can be lowered through energy efficiency and the use of energy generated by low emissions sources.

- » How will the project reduce its greenhouse gas emissions and peak demand?
Consider:
 - › How will the project implement well-designed systems aimed at lower operating emissions?
 - › How will the project select high-efficiency equipment over less energy-efficient alternatives?
 - › How will the project implement well-designed and zoned lighting that is energy efficient and appropriate for a space use?
 - › How will the project use efficient supplementary equipment?
 - › Will the project procure zero carbon energy sources and reduce use of natural gas for building services?

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

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Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

TRANSPORT

The use of motor vehicles directly contributes to climate change in two ways—through the high amounts of energy required to produce cars, and build and maintain supporting road transport infrastructure and services, and the direct emissions that result from car operations. Reducing occupant dependency on private car use can be an important means to reduce overall greenhouse gas emissions. This may include initiatives that encourage and make possible the use of mass transport options, cycling or walking, and the selection of sites that are close to a large number of amenities.

» How will the project support reductions in carbon intensive modes of transport, promote the health and fitness of commuters and increase the liveability of the project location?

Consider:

- › Is the project located on a site that has readily accessible public transport options?
- › Is it near diverse amenities or initiatives to encourage the use of alternative transport options, such as bicycles or electric vehicles?
- › What policies/procedures/legal requirements exist to respond to this?

WATER

Reductions in water consumption can be achieved through maximising water efficiency and using reclaimed water sources. Projects can reduce the consumption of potable water through measures such as incorporating water-efficient fixtures and building systems, and water re-use.

» How will the project support reductions in potable water consumption?

Consider:

- › How will the project select equipment that is more water efficient than comparable standard practice equivalents?
- › How will the project use water-efficient supplementary equipment?
- › How will the project select water-efficient toilets, taps and showers?

MATERIALS

Projects should address the consumption of resources in building construction by encouraging the selection of lower impact materials. Absolute reductions in the amount of waste generated should also be encouraged as well as recycling as much as possible.

» How will the project support the use of products and materials with lower impact? How will the project assess the materials used in terms of their life cycle, impact and toxicity?

Consider:

- › How will project address life cycle impacts of construction materials and products?
 - › How will project support the selection of furniture, assemblies and flooring materials that are certified or re-used?
 - › How will the project use products and materials that are subject to chain-of-custody agreements?
- » How will the project support the reduction in waste to landfill?
- Consider:
- › How will the project minimise waste through efficient design and material selections?
 - › How will the project consider waste minimisation across its entire life cycle?
 - › How will the project use materials with high levels of recycled content or select re-used products and materials?

SUSTAINABILITY ASSESSMENT

Demonstrate how the project fulfils the following sustainability principles

Succinctly outline the major initiatives or elements of the approach that will achieve each principle, plus the most significant outcomes or benefits. Specific, quantitative information should be included where available.

Information should be succinct (dot points encouraged) and no more than a half page per principle.

Achievement level:
(indicate level achieved)

**Advanced, moderate,
basic, compliant,
or poor.**

LAND USE AND ECOLOGY

Negative impacts on the project site's ecological value as a result of development should be reduced. The project should minimise harm and enhance the quality of local ecology.

- » How will the project support the reduction in waste to landfill?
Consider:
 - › Will the project improve the ecological value of the site?
 - › Will the project be developed on a site that has limited ecological value, re-use previously developed land or remediate contaminated land?
 - › How will the project seek to reduce the ecological impacts from occupied sites? E.g. best practice approaches for addressing stormwater, reducing impacts of heat island effects from hard surfaces and reducing light pollution.
- If relevant:
 - › Has the site been remediated in accordance with best practice remediation strategy?

EMISSIONS

The project should minimise point source pollution emissions. Negative impacts commonly associated with buildings include damage to the environment through refrigerant leaks or disturbances to native animals and their migratory patterns as a result of light pollution.

- » How will the project seek to minimise point-of-source pollution emissions?
Consider:
 - › How will the project minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure?
 - › How will the project minimise light pollution?
 - › How will the project implement systems to minimise the impacts associated with harmful microbes in building systems?
 - › How will the building encourage operational practices that minimise the environmental impacts of refrigeration equipment?

INNOVATION

The project should recognise and encourage the implementation of innovative practices, processes and strategies?

- » How does the project recognise and encourage the implementation of innovative practices, processes and strategies that promote sustainability in the built environment?
Consider:
 - › Will the project use a process or technology that is considered innovative in Australia or the world?
 - › Will the project undertake a sustainability initiative that contributes to broader market transformation towards sustainable development?

Appendix 2: Funding options

Government appropriations (indirect)

The predominant method of funding infrastructure is through appropriation of a specified amount of funding over a stipulated time period. The funding for appropriation is derived from several sources including:

- » taxation
- » intergovernmental transfers
- » Government-owned corporation dividends.

User pays mechanisms (direct)

A method of funding infrastructure that is becoming more common is the user pays (user-contribution) principle.

A significant portion of infrastructure industries such as electricity, water, gas and some roads are now based on these principles.

Infrastructure can either be owned by the private sector or the public sector due to the potential commerciality of user-contribution regimes.

Another form of user-contribution mechanism that is becoming increasingly common around the world is congestion charging (peak demand pricing).

Value capture (direct/indirect)

Another potential funding option is through value creation and capture opportunities where third parties benefit from the construction of infrastructure. Value capture involves capturing a portion of the value that the infrastructure investment adds to either surrounding assets or is generated through the additional consumption of goods and/or services. The most common value creation and capture opportunity is the uplift in land value that the investment in infrastructure can generate. The benefits to surrounding properties from infrastructure investment can potentially be captured through mechanisms such as broad-based land taxes. Value capture mechanisms can provide either upfront funding (one-off charge) or a source of ongoing funding (land taxes).

Value capture can occur through existing taxation systems (if already in place) or through a dedicated mechanism specifically coupled to an infrastructure investment. Taxation systems capture value where rising land values, or other increased economic activity, result in more taxes being paid by beneficiaries of the infrastructure through e.g. increased land tax. To use value capture does not usually require a change in the rates of taxation being applied.

The degree of automatic value capture that occurs depends on the structure of a jurisdiction's tax system. Opportunities for value capture are greater where broad-based land taxes are applied.

Where the taxation system does not readily capture value directly related to an infrastructure investment, a dedicated mechanism should be applied. Dedicated value capture mechanisms can include:

- » betterment levies (areas that directly benefit from infrastructure investment are charged a levy)
- » leasing/sale of rights for retail, commercial and residential development facilitated by the infrastructure investment.

Developer contributions (direct)

A common funding source is contributions from land and property developers (developer contributions) that cover the costs of the infrastructure necessary to support new developments. These contributions can be in the form of mandated upfront financial contributions, 'in kind' provision of infrastructure or land transferred to the government. The contributions can take forms such as:

- » upfront charges to cover necessary infrastructure (roads)
- » development of public amenities (parks)
- » construction of public assets (libraries and housing).

In Queensland, upfront mandatory financial contributions are made to local governments for 'trunk infrastructure' (transport, water, sewer, storm water and parks). Provision of 'in-kind' local infrastructure is also commonly required as a condition of approving a development application.

Financial contributions for Queensland Government infrastructure (such as main roads, electricity infrastructure and other public infrastructure) are not routinely required; however, can occur on a case-by-case basis as a condition of approval for a development.

The provision of 'in-kind' works also occurs on a case-by-case basis. This contrasts with other jurisdictions such as Victoria where a Growth Area Infrastructure Contribution (GAIC) is collected by the government (at a set rate per hectare of developed land) within a defined area. The contributions are used to fund essential state infrastructure to support new urban development.

Less commonly, developer contributions are levied as a form of value capture mechanism. For example, in NSW the announcement of the Parramatta Light Rail project included a proposal to impose a special infrastructure contribution of \$200 per square meter for new residential developments along the corridor. The contribution has been described as a form of value capture mechanism as developers are expected to receive a windfall gain due to increased land values.

Asset sales (indirect)

The sale of assets can be used to fund new infrastructure investments. Existing (brownfield) infrastructure that is supported by a user-contributes regime will be commercially attractive to the private sector. This infrastructure can be sold, and the proceeds used to fund new infrastructure developments.

The sale of assets that generate dividends may not increase the actual funding capacity of the government, but rather bring forward the funding. Asset sales will only generate additional funding capacity where the sale proceeds exceed the net present value of the future stream of dividends payable to government.

Any application of asset sales as a funding source should consider existing government policy.

Appendix 3: Design, cost and risk

Purpose

The project design, cost estimate and risks are interrelated/interdependent variables. They are defined and refined as the project progresses from one stage to another.

The analysis should be targeted so that an appropriate level of design and project knowledge is available to inform robust, reliable and transparent cost estimates at any stage in an infrastructure proposal assessment.

Key considerations

Engineering and design efforts should provide context to the reference design of each option (sometimes referred to as project definition), informing robust and transparent cost estimates for all major project elements. Reference design analysis should include: scope, project scheduling, identification of risks and constraints, and any assumptions used.

Key considerations include: analysis of all key inputs; design and operating principles; design complexity; interdependencies of design elements; use of benchmarking data; sequencing requirements; the level of resources/effort used to inform design and cost estimates; assurance activities; and the assessment of risk and uncertainty including sensitivity analysis.

Analysis and inputs

Engineering and design efforts should include technical investigations and engineering/architectural design identifying the nature and limits of works, cost assumptions and escalation rates, interdependencies and interfaces (e.g. existing property or infrastructure, grade separations), and any constraints.

As the cost estimate is refined through the analysis and project lifecycle (e.g. Stage 2: Options Analysis and Stage 3: Detailed Business Case), increasing emphasis should be placed toward project aspects which account for the greatest cost and/or risk. However, all elements within a cost schedule should be considered.

These efforts should also incorporate technical aspects such as hydrology and geotechnical considerations, as well as inputs relevant to the design, such as social and environmental impact, legal and regulatory considerations, demand and economic analysis. These efforts should also respond to the risk profile of the project, such that more detailed design on specific elements is available in response to any risks identified.

Design complexity

The required level of engineering and design efforts will be guided by project characteristics and complexity, as well as the availability of comparable project data, with the aim to integrate a sufficient level of project knowledge into cost and risk estimates (refer **Table 30**). The aim is to ensure cost estimates reflect the state of the design, the project risk profile and corresponding level of contingency at each stage.

As such, complex or bespoke projects which lack comparable project data will require more fit-for-purpose design and technical investigation to support robust, transparent, and defensible analysis to provide confidence to decision makers. Quantity surveyors (supported by engineers) will use relevant data, including from comparable projects and benchmarking, to inform cost estimates regardless of the level of project complexity and design.

Table 30: Illustrative complexity and level of design

ILLUSTRATIVE INPUT TO DESIGN AND COST ESTIMATES	NON-COMPLEX	COMPLEX
Project complexity	Non-complex: routine or repeatable project; no complicating technical factors or unique service delivery requirements	Complex: bespoke project with complicating technical and/or service delivery requirements
Illustrative level of project design	20% (concept level)	30% (concept level)
Engineering and design efforts to inform reference design	Design (including engineering and/or architecture) Technical investigations	Design (including engineering and/or architecture) Technical investigations
Quantified risk and contingency range	90% to 70%	90% to 70%

Benchmarking analysis

Where reference projects and comparable project data is readily available, benchmarking combined with design works and technical investigation can support an informed robust, transparent, and defensible analysis. However, benchmarking is not a substitute for inadequate design.

Level of resources to dedicate to engineering and design efforts

At all stages of analysis, resources should be appropriately allocated to higher levels of cost and risk impacted items in engineering and design. Expenditure for engineering and design efforts is minor relative to the total project cost, but can materially influence investment decisions and delivery outcomes.

Sophisticated design efforts and thorough engineering investigations in the planning stage inform more robust analyses. This is particularly important as the key drivers of cost escalations (and assumption error) often relate to unforeseen risks and the delivery environment (e.g. timing, labour, site-specific factors). Critically, thorough engineering and design efforts help to establish realistic set co-design and delivery model approaches, to support analysis of proposals through later stages. Consequently, the analysis provides greater certainty and confidence to decision makers throughout the planning and procurement stages of an infrastructure proposal.

Engineering and design efforts in cost estimation

Developing a robust cost estimate requires a well-defined scope, sufficient data and appropriately qualified professionals (including quantity surveyors) with sufficient peer review checks.

In the early stages of the project, the scope and risks are being defined such that the cost estimate accuracy will be low with a wide range of possible outcomes. As shown in the example in Figure 7, it is expected that the cost estimate will become more accurate over time as the design is refined and more project information (informed by targeted engineering and design efforts) becomes available.

Engineering and design efforts should support this process by enhancing the reference design, refining the project scope, informing the cost and work breakdown schedule, clearly documenting technical decisions and assumptions, and developing an evidence base to support the appraisal of risks, and calculation of contingencies. A 'basis of estimate' document should outline any assumptions and exclusions underpinning the cost estimate. This analysis should inform robust, defensible, and transparent cost estimates and provide confidence to decision makers as the cost estimates progress the business case stages. Indicative minimum level of design considerations are outlined in Table 31.

Where the project cost history is such that estimates progress well above the first or previous cost estimates, a post-delivery and benchmarking review should be performed to inform future projects.

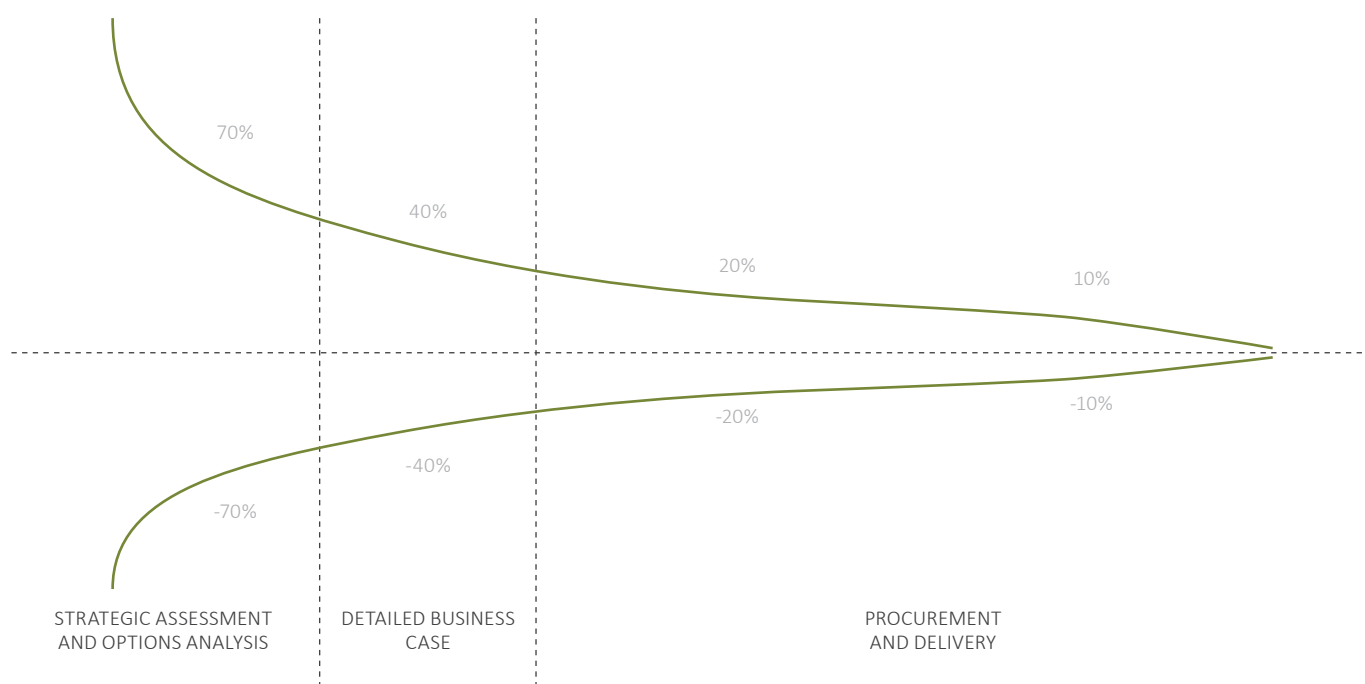


Figure 7: Example indicative estimate accuracy across the infrastructure lifecycle

SOURCE: Victoria Treasury, Risk, Time, Cost and Contingency (RTCC) Guidelines, <https://www.dtf.vic.gov.au/sites/default/files/document/Risk%2C%20Time%2C%20Cost%20and%20Contingency%20Guidelines.docx> , [Accessed 20 July 2022].

Table 31: Indicative Design, Risk and Cost Estimates for Options Analysis and Detailed

INDICATIVE INPUT TO DESIGN AND COST ESTIMATES	OPTIONS ANALYSIS (STAGE 2)	DETAILED BUSINESS CASE (STAGE 3)
Indicative level of design	15% to 30%	30% to 70%
Engineering and design efforts to inform reference design	<p>Technical investigations</p> <p>Establishment of service need and demand to support the design of the longlist options</p> <p>Longlist: concept design (engineering and/or architecture), order of magnitude estimate and/or benchmarking of recent comparable projects (if appropriate).</p> <p>Shortlist: Project design that is able to reasonably compare shortlisted options</p>	<p>Technical investigations</p> <p>Preliminary or Schematic design (engineering and/or architecture)</p> <p>Nomination of applicable cost estimate class / category</p> <p>Design informs costing estimates that are robust, defensible, and risk adjusted with an appropriate contingency allowance, with a well-defined scope and breakdown of projects costs</p>
Indicative contingency range	90% to 70%	70% to 40%
Purpose	<p>Longlist: Screening, “what if” analysis, engineering and design efforts examine differences in high-level alternatives</p> <p>Shortlist: Concept design data that is able to reasonably compare project options.</p>	Design provides the approved budget estimate of the project

Assurance activities

Analysis should be undertaken by subject matter experts/advisors (including quantity surveyors, engineers, and financial analysts) with an appropriate level of expertise to inform cost and risk estimates that are robust and defensible.

Like all technical analysis completed for proposals, engineering and design efforts should be subject to appropriate assurance arrangements. Assurance mechanisms should include specialist peer and technical review which assesses the: appropriateness of engineering/architectural solutions; the cost/risk/contingency estimate and the basis of estimate; as well as the validity of any assumptions. Additional focused technical reviews should be undertaken in response to any identified or perceived issues, to ensure that all outstanding issues are resolved or reflected in the cost and risk estimates.

While peer review is important at all stages of analysis, it is especially important during the early stages. This is because, as shown in Figure 8, analysis at one stage will determine or constrain subsequent analysis in further stages. That is, an inadequate demand or service need assessment is likely to result in an incorrect scope/design in response to that analysis, cascading to inappropriate costing and risk, financial and economic analysis.

As part of these arrangements, engineering and design efforts should also align with best practice guidance (e.g. for the built environment QDesign from the Office of the Queensland Government Architect (OQGA)).

Principles underpinning engineering and design assurance activities include:

- » **Completeness:** engineering and design outputs contain a sufficient level of technical information and project knowledge necessary to provide confidence in analysing cost estimates (with contingencies), and risks.
- » **Transparency:** the information has been prepared without bias and with all assumptions, risks and mitigations, and compliance with legislative or standards clearly documented. Emphasis should be placed on transparently outlining assumptions used in the analysis, and the reasoning underpinning them.

Peer reviewers and supporting advisers must be appropriately qualified and delegated to review analysis strictly within their domain of expertise and experience in the sector. For example, quantity surveyors should be tasked only with reviewing quantity surveyors work, and not economic or financial advisers. Similarly, appropriately qualified/experienced designers and design peer reviewers. The advisers and peer reviewers appropriate to each stage of analysis is shown in Figure 8 below. Note that this may be an iterative process, and not linear in nature.

Figure 8: Stages of analysis and appropriate peer review



Sensitivity analysis

Sensitivity analysis is a method used to account for risks and uncertainties with key parameters used in analysis, by assessing the possible impact of risks and uncertainties on project outcomes. Its objective is to assess the robustness of project outcomes to variables which determine its viability.

Sensitivity analysis span deterministic and probabilistic approaches. Deterministic methods include: range-based methods (considering the range of values of each project cost element), factor-based methods (reviewing factors which will influence project outcomes and using that analysis to calculate a single overall range), or reference-class forecast methods (basing the contingency on the historical difference between the initial base estimate and final cost of a similar “class” of projects). Probabilistic methods use the above analysis and inputs, but additionally utilise statistical

sampling to simulate the effect of uncertain variables on model outcomes. Regardless of method, all sensitivity analysis must be supported by an appropriately qualified quantity surveyor.

DETERMINISTIC SENSITIVITY ANALYSIS

Deterministic sensitivity analysis methods apply a predetermined or defined percentage of contingency for the project. This is often the simplest approach to contingency calculation but involves a high degree of subjectivity and judgement, and may be difficult to justify or defend if derived from intuition or past experience. As such, deterministic approaches should use a robust method, with all assumptions and derivations clearly and transparently outlined, and peer-reviewed to ensure they are justifiable and defensible.

The following methods should be used for deterministic sensitivity analysis:

- » Factor-based methods – This method determines the contingency through a strategic review of the factors that will influence the project’s ability to manage its cost outcome. It is most applicable during the early stages of the project lifecycle, where there is likely to be insufficient information or resources available to undertake a more detailed assessment.
- » Range-based methods – This method considers the range of values that the elements comprising the project cost estimate could take, and aggregates this to arrive at a single contingency estimate. This method should ideally calculate the minimum, maximum, and mean values for each element, and assumes that all elements are uncorrelated, and therefore that the mean values and variances are statistically additive.
- » Reference-class forecasting methods – This method determines the contingency based on the gap between the initial base estimate and final costs of a “class” of related previous projects. To be effective, this method requires a sufficient number of appropriate reference projects to be identified from past data, and assumes the project being compared to will behave in broadly the same way as the others in the reference set.

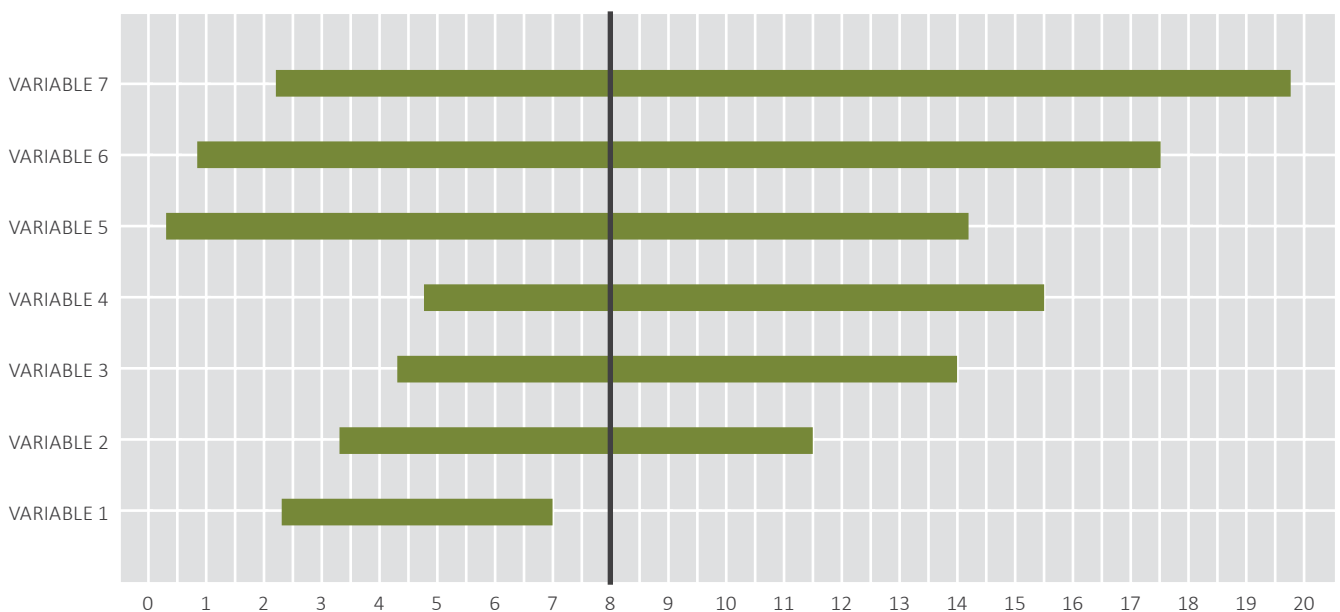
PROBABILISTIC SENSITIVITY ANALYSIS

Probabilistic analysis is a computer-based technique that uses statistical sampling and probability distributions to simulate thousands of iterations to determine the risk adjustment of variables on model outcomes (often referred to as Monte Carlo analysis). It is frequently used to determine contingency estimates in infrastructure projects with large uncertainties in costs to give an indicative range of outcomes for the key components (e.g. tornado graph Figure 9) and total cost.

The appropriate use of probabilistic techniques rests on well-specified design and cost inputs, sufficient data to support statistical estimation and analysis, and the correct interpretation and application of results. While using more advanced techniques than deterministic methods, probabilistic methods are not value-free and can involve a material degree of subjectivity. Appropriate judgement is still required to arrive at a robust contingency estimate, for example when defining the probability distribution and range for variables estimated using Monte Carlo analysis.

As such, probabilistic analysis should only be used where there is sufficient data and project knowledge to support a probability density function that is robust and appropriate to the parameters being estimated. Underlying assumptions inputted to the probabilistic analysis should be transparent, robust and defensible. Failing this, the use of probabilistic techniques would produce spurious results and should be avoided. Rather, a transparent deterministic method should be used.

Figure 9: Example Tornado Chart

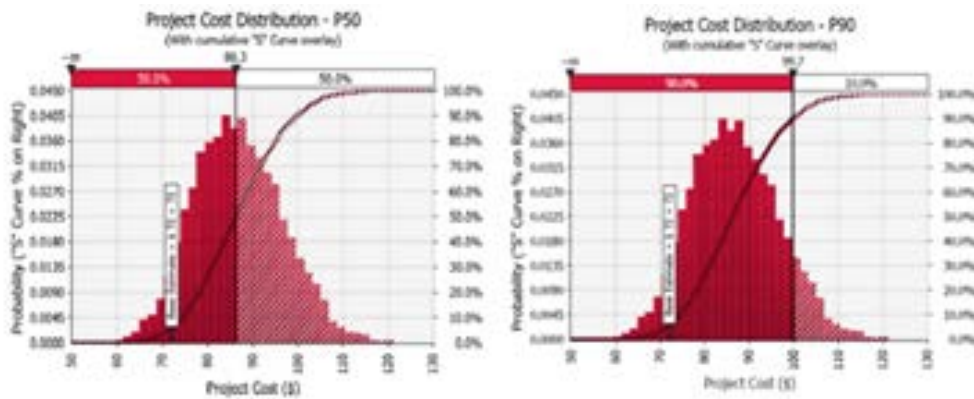


P-values in probabilistic analysis and simulation

Each generated estimate of total project cost from a probabilistic simulation can be given a p-value indicating the likelihood that the cost will be less than or equal to that amount. For example, a P50 cost estimate would represent

an estimate of project cost with sufficient contingency that there is a 50% expectation that the cost of the project would not exceed this level (visually represented in Figure 10 below).

Figure 10: P50 and P90 cost distribution examples



SOURCE: <https://www.finance.gov.au/government/commonwealth-investment-framework>

Probabilistic outputs should be applied and interpreted appropriately. A P50 and P90 value is not an indication of the level of design or the quality of the analysis. Rather, it is a probabilistic estimate of the parameter value based on

the range and probability distribution assumptions used to generate the estimate. As such, a P90 estimate for a low level of design would not represent a high level of confidence in the cost estimates for the project.

In practice, some analysis used by Quantity Surveyors may be based on ranges for each variable, using a technique called range analysis. This practice bases the defined range of values for a variable typically on historical record/knowledge, which is then used to drive Monte Carlo analysis. Most importantly, there is often no scope for peer review to undertake detailed checks on these assumptions and judgement used in the range analysis, and to verify the basis of estimate.

As such, the use of range analysis as an input to probabilistic analysis assumptions should be supported by risk analysis workshops and historical data sets. This should be clearly and transparently disclosed in all probabilistic analyses reporting results, including all assumptions, analysis and the basis for ranges used in defining the probability distribution.

Probabilistic analysis outputs should identify the variables which are likely to have the largest impact on business outcomes, and provide their confidence interval. This should be clearly presented in a tornado chart (as shown in Figure 9). While the chart may indicate each variable's individual impact on the overall cost as independent to each other, in reality, many input variables can be interrelated and may not vary independently.





Reference to specific guidance

In developing appropriate levels of design, and risk adjusted cost estimates, overarching risk appetite statements should be satisfied to ensure alignment with proponent acceptance of risk. Whole-of-Government, Sector- and Agency-specific guiding advice should be applied.

Examples include:

- » A Guide to Risk Management, A Guide to Risk Management- Queensland Treasury, accessed 07.03.2023
- » Project cost estimating manual, Project cost estimating manual (Department of Transport and Main Roads) (tmr.qld.gov.au), accessed 07.03.2023.

Application of such guides encourages improved practice.

Examples of parameter and expected values

The parameter values used for a proposal cost estimate should reflect a robust and transparent assessment of price and volume that is based on the most up-to-date data and costings. This should include considerations of the current market capacity and supply chain reality, usually assessed by a quantity surveyor, and reflecting the level of design.

Clearly, if the level of design is not very high (e.g. 5% – 10%), then the level of confidence in the estimates will be very low. This is particularly so when key parameter values are volatile and changing rapidly, and variable across different parameters. In these cases the expected values / ranges need to be carefully assessed.

EXAMPLE 1: PRICE VOLATILITY

Suppose that the price of concrete is to be calculated as a key input into the cost estimates. Concrete prices typically range from \$10/t to \$30/t, based on historical data over the past 3 years. However, due to supply chain and capacity constraints, concrete prices have recently approached \$30/t over a sustained period.

The expected value in this instance is not the historical average of concrete prices over the past 3 years⁵, but needs to be assessed (by a quantity surveyor) in the current context of \$30/t, as the recent price increase suggests sustained higher prices is likely over the project construction period.

As such, the expected value should be calculated at the points in time in the construction ramp-up period and include the application of escalation rates reflecting a defensible and transparent projection of future prices for each of the key parameters. This should be performed by a quantity surveyor working in close consultation with the financial adviser.

EXAMPLE 2: VOLUME

Suppose that the volume of concrete is to be estimated as an input for options analysis. As the reference design at this stage of the analysis is nascent, the exact volume of concrete needed is not yet known, and subject to uncertainty.

A single estimate is unlikely to reflect this uncertainty and is insufficient to quantify the true amount of concrete needed. The estimate should therefore include a confidence interval that is defensible, transparent, and reflects the project complexity and level of project design.

⁵ This is because the expected value of a random variable is not necessarily equal to its historical average. The expected value of a random variable represents the most likely outcome, which is the weighted average of all possible values of that variable (i.e. the entire population). This may not be the same as the historical average, which represents only a sample of all possible values (in this example, the sample is the historical price of concrete over the past 3 years).

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