

# NSW Government's use and management of consulting services

Hearing – 15/06/2023

## NSW Health response to Questions on Notice

### QUESTION 1 – Page 17

The CHAIR: If we could commence questions with some basics around NSW Health's total spend on consulting, are you able to tell us how much NSW Health has spent on consulting firms since 2011?

ALFA D'AMATO: Since 2011—I need to take that on notice. But I can tell you that what we spent last year—and that was reported in the annual report—for consultants is \$6.372 million. This includes consultancies less than \$50,000 and above \$50,000, which are disclosed and itemised in the annual report.

The CHAIR: Great, so that's 2021-22?

ALFA D'AMATO: That's 2020-21.

The Hon. SCOTT FARLOW: Is that calendar year or financial year?

ALFA D'AMATO: It's financial year. In respect of 2021-22, the total was \$3.7 million.

The CHAIR: That sort of accords with—I've been through the annual reports and I think it's about \$29 million all up, but if you could come back on notice that would be great.

### ANSWER

Financial year	NSW Health total consulting services spend (\$M)	% of Initial Total Expense Budget
2011	16.7	0.11%
2012	14.3	0.09%
2013	15.1	0.09%
2014	19.6	0.11%
2015	18.0	0.10%
2016	18.1	0.09%
2017	18.0	0.09%
2018	15.5	0.07%
2019 <sup>b</sup>	26.9	0.12%
2020	19.7	0.08%
2021 <sup>c</sup>	31.1	0.12%
2022	22.3	0.08%
Total	235.3	

**Source:** The actual amounts in the above table represent NSW Health's total consultant expenditure which is published in the Annual Audited Financial Statements of the NSW Health Annual Report.

### Notes

- The four years from 2019 to 2022 reflect the restated Consultant expenditure amounts which are updated in subsequent years' published annual reports (eg the updated 2020 can be seen in the 2021 Annual Report). NSW Health updated account mapping to ensure compliant and consistent reporting which was endorsed by the Audit Office of NSW.
- In the course of compiling these responses, NSW Health has identified that the 2019 figure is overstated by \$9.0M. The correct amount that should have been included in the financial statements

was \$17.9M. This is because the amount reported in the 2019 financial statements erroneously included Translator Services and Quality Assurance Fees.

- (c) The increase from 2020 to 2021 reflects expenses related to NSW's COVID-19 response. Note the Commonwealth funded fifty per cent of these expenses in accordance with the *National Partnership on COVID-19 Response* agreement between the Commonwealth and States and Territories.

## QUESTION 2 – Page 17-18

The CHAIR: Are you aware, then, of how much the local health districts have spent on consultants since 2011?

ALFA D'AMATO: Since 2011? I need to get back to you. I don't have the figures since then.

The CHAIR: As a matter of course, although the Auditor-General was saying that it's very difficult for her to find the total spend on consultants from the local health districts, presumably NSW Health has that data readily available. I understand you haven't brought it here today, but it is readily available?

ALFA D'AMATO: It is, but I do want to make a comment that each individual local health district prepares a financial statement which is publicly available and they report the spend on consultancies for each district. That is publicly available. What is not available is the itemised details that we make available for the Minister of the moment as has been the practice in compliance with what has been requested.

...

The CHAIR: Understood. I table a document. My office went through all the annual reports for each of the local health districts and we came up with a figure of \$124 million since 2011. If I could ask you to take that document away and on notice come back and confirm whether or not that is the correct amount, that would be very useful.

## ANSWER

Financial year	Total LHD consultancy spend (\$M)	Total LHD expense budget (\$M)	Total LHD consultancy spend as a percentage (%) of total LHD expense budget
2011*	2.4	5,185.6	0.05%
2012	5.5	11,015.1	0.05%
2013	9.7	11,191.5	0.09%
2014	8.6	11,821.8	0.07%
2015	9.4	12,466.9	0.08%
2016	16.4	13,241.7	0.12%
2017	13.0	13,767.4	0.09%
2018	9.6	14,480.0	0.07%
2019	11.3	15,302.8	0.07%

2020	10.1	16,148.6	0.06%
2021	15.0	17,113.2	0.09%
2022	14.2	18,578.0	0.08%
<b>Total</b>	<b>125.2</b>	<b>160,312.6</b>	<b>0.08%</b>

\*6 months only

### QUESTION 3 – Page 19

The CHAIR: Just to put it in a different comparison or a different light, the spend just from the local health districts, not including the rest of Health, in the last year on consultants was more than Education, DPC and DPE spent together—so combined. That is still objectively quite a large consulting spend from these local health districts, wouldn't you agree?

ALFA D'AMATO: I would need to check the figures from Education and what has been reported in Education. I think, as it's been noted this morning by the Auditor-General, there are some inconsistencies in the way different clusters are reporting. So I need to just check that the figures you've quoted are comparable to what we have reported.

### ANSWER

Please refer to the Audited Financial Statements for the respective departments.

### QUESTION 4 – Page 19

The CHAIR: Just to drill down into what that might look like in practice then, I understand the Qudos arena immunisation or vaccination hub was run for the Western Sydney Local Health District by PwC.

**Would that have been classified as a contracting service or as a consulting service?**

ALFA D'AMATO: I would need to confirm the details but, as you said at the very beginning this morning, at times we need to engage consultants because we need something to be done quickly. That's more likely than not that it could be a contracting rather than a consulting.

### ANSWER

Services provided by PwC to assist NSW Health to establish and support the Qudos Bank Arena NSW Health Vaccination Centre were not defined as a consulting service on the basis that the services provided were not consistent with the applicable definition of a consultant. Services provided included support for the vaccination centre logistics model, inventory planning, warehousing, human resource management, operational planning, activity scheduling, telephone call centre and project oversight.

## QUESTION 5 – Page 20

The Hon. MARK BUTTIGIEG: Can I ask on a related point, on that previous PwC example where they were ostensibly contracting for Qudos, is there any probity oversight from the department to ensure that the potential for advice from the same firm isn't conflictual on then a subsequent contract?

ALFA D'AMATO: I need to double-check. I have to admit that what we put in place during COVID is probably slightly different to what would normally occur. On top of that I also would like to state that we have a new procurement policy, which has been put in place since June last year. It's likely that might have been after the Qudos arena, so I will need to get back to you.

The Hon. MARK BUTTIGIEG: That would be good. So if we could have pre- and post- any probity measures that either didn't exist or now exist, because you see the potential for, obviously—and it was raised this morning in evidence from the Auditor-General as well.

## ANSWER

The engagement of PWC in this instance was administered by the Western Sydney Local Health District. The [NSW Health Policy Directive PD2022\\_020 NSW Health Procurement](#) states that the probity principles of fairness, impartiality, accountability, transparency and value for money must govern procurement decision making by NSW Health agencies. These principles are in line with the probity principles from *ICAC's Direct Negotiations: Guidelines for Managing Risks*. The [NSW Health Policy Directive PD2015\\_049 NSW Health Code of Conduct](#) and [NSW Health Policy Directive PD 2015\\_045 Conflict of Interest and Gifts and Benefits](#) support staff in managing probity risks.

The NSW Health Procurement Procedures advise staff to engage an internal or external probity adviser:

- Where the integrity of the process may be called into question
- Where the project is potentially sensitive
- To avoid a perception of bias or favouritism
- Where the process is very complex
- Where substantial costs are involved in preparing submissions
- Where the procurement is high value
- Where there has been a previous abandoned process, or a previous process with complaints.

Staff are also advised not to repeatedly engage the same probity adviser to avoid perceptions of bias.

The NSW Health Procurement Procedures provide staff a more expansive explanation of probity, fairness, confidentiality and conflict of interest than the previous *PD2019\_028 NSW Health Procurement Policy*. The Procedures provide staff guidance on NSW Health's expectations on preventing and managing occurrences in line with *PD2015\_045 Conflicts of Interest and Gifts and Benefits Policy*, *PD2020\_020 NSW Health (Goods and Services) Procurement Policy* and Procurement Procedures provides detailed advice on contract management to ensure engagements of any nature are managed appropriately. Guidance on contract management requirements were not as detailed in the previous policy.

## QUESTION 6 – Page 21

The Hon. MARK BUTTIGIEG: Can I quickly check, because it was a related point on the evidence, the attestations of this self-assessment model. Are you aware of any scrutiny by the Procurement Board on these attestations? Or are they just taken at face value? Can you recall any examples where the Procurement Board has come back to an LHD or the department and said, "Actually, we want to drill down into this a bit"?

PHIL MINNS: I'm not familiar with one. But we can take it on notice and seek to confirm.

## ANSWER

The NSW Procurement Board requires accredited agencies to provide an annual outcomes report, annual procurement plan and a self-assessment attestation as part of their accreditation requirements. The self-assessment attestation requires the Secretary, NSW Health to confirm that best endeavours have been undertaken by their agency to comply with their accreditation requirements. The NSW Procurement Board has not previously raised any concerns with regard to the NSW Health self-assessment attestation.

## QUESTION 7 – Page 22

The CHAIR: Just going to a couple of recent contracts that have been entered into by health agencies since that update to policy. These are both Ambulance Service of NSW contracts. I'm looking at one from 4 October last year. This is a notification of an amended contract from—it's looking at September 2022-23. It is with Deloitte, in relation to the SWIFT Program. It's for an amount of \$1.8 million. **Can you tell us what that was for and why it needed to go to an external provider?**

ALFA D'AMATO: I probably need to go back to the details of the particular contract. But, from what I'm familiar with, the overall program is about additional ambulance stations that were announced in this year's budget. That program of work is the implementation part. But, as I say, I just need to go back to it. We're looking at around 30 new stations across the State.

The CHAIR: This particular one is in relation to the establishment of a project management office and then a governance and performance-monitoring framework. I understand that this went out on limited tender. I'm interested in knowing why that was, I guess, for such a huge amount. **Also, did that limited tender lead to more than just Deloitte putting in for the work?** I also understand that there have been a number of concerns raised in relation to the product of that work. I can put some more questions in on notice. But it does raise the question of how do you assess value for money within Health when looking at these sorts of projects.

ALFA D'AMATO: First I'll take that on notice in respect to the details of the particular engagement because I'll have to check with the chief procurement officer. In regard to assessment and value for money, that is again documented in the policy and clearly spells out in the procedures what it is that we're looking for. Effectively, it is a balanced approach where we mitigate risks and balance the opportunities to deliver on the outcomes that—just going back to the section here—

The CHAIR: Just while you're doing that, can you just also clarify. **My understanding is that a limited tender for a \$1.8 million contract is just a breach of the procurement rules. Is it not?**

ALFA D'AMATO: It depends whether the limited tender—what you mean by that. But, as I say, I'm more than happy to have a look at the details of the particular contract.

...

*Page.34*

ALFA D'AMATO: Can I go back to your original request in regard to Ambulance and whether there were other participants in the suite. There were six providers who responded to the request, and the outcome is recorded in the e-tender. If you want, I can provide you with the names of the companies there.

The CHAIR: That would be good. Thank you. Excellent.

## ANSWER

The contract was to provide resource support to the SWIFT Program to:

- i. Establish a Program Management Office
- ii. Design and provide oversight on Governance and Performance Monitoring Framework
- iii. Help set up the program and prepare internal resources to take over the program in full.

NSW Ambulance sought assistance from an external provider because there are limited resources within NSW Ambulance that have experience on a program of this complexity and size, both in scope and budget (\$1.76 billion over a four-year period). NSW Ambulance also rotates key staff throughout engagements to ensure they are provided the opportunity to broaden their project and program management skills. This also provides opportunities to ensure transfer of knowledge occurs which effectively reduces the reliance on external services moving forward.

Six pre-qualified suppliers were invited to submit a response to the limited tender in accordance with NSW Health procurement policy, five of which provided a response.

- i. Ernest & Young
- ii. Price Waterhouse Coopers
- iii. Deloitte
- iv. KPMG
- v. ConnellGriffin
- vi. EGIS – did not submit a response

Additionally, the [NSW Health Policy Directive PD2022\\_020 NSW Health Procurement](#) requires procurements using a whole-of-government prequalification scheme to seek at least three written quotes for goods or services valued over \$250,000. In this case, quotes were sought from six suppliers on the prequalification scheme, five of the suppliers submitted a response to the tender. This process exceeded the minimum requirements.

## QUESTION 8 – Page 22

The CHAIR: I'll just mention the other one I have in front of me as well. This one is 28 November 2022. Again this is through Ambulance Service of NSW. It's a rostering and resource-planning system, which again has been subject to quite a lot of criticism. It's with PricewaterhouseCoopers. It's for just over \$1 million and, again, was done with limited tender. **If you could find out for us on notice who else put in for that work, that would be useful.** There is a section here where they talk about the evaluation criteria against which the tender was assessed and there is a 20 per cent weighting for "Demonstrated skills and experience of key personnel proposed" to work on the project. That is surprising in something where it looks like it didn't actually go out to a broad tender. It looks and smells like it's really just gone out to one particular firm and partner that they knew wanted the work. If you could come back on that one, that would be very useful.

ALFA D'AMATO: Sure.

## ANSWER

- i. Price Waterhouse Coopers
- ii. Deloitte
- iii. KPMG
- iv. Nous Group

## QUESTION 9 – Page 22

The Hon. MARK BUTTIGIEG: But my point is that there is no machinery of government that goes—for example, in the PwC case, when the decision was made to give it to them to do the ambulance rosters, were there relevant inquiries made as to the skill set and the experience based on our previous experience?

PHIL MINNS: If they used our procurement framework even before the refresh, they would have done that work.

ALFA D'AMATO: Let me back to you with the details on that.

## ANSWER

Yes

Demonstrated skills and experience of key personnel proposed' is one of the standard criteria measures used for tenders and ensures companies match the resources they are offering to the roles and responsibilities required in the tender. Tenderers provide information on personnel skills and experience by submitting resumes and information on how many hours those resources will work on the project per week. The tender evaluation committee looks at these resumes and scores them in relation to the resources needed to support the project.

## QUESTION 10 – Page 22

The CHAIR: That would be very useful. I take your point around "Demonstrated skills and experience of key personnel proposed". We didn't see it in the other tender that I raised. It stuck out. If that's just something that every contract has regardless, I would like to know a bit more about how many contracts across NSW Health do have that as a criterion that was evaluated. In any case, if you could come back, that would be great.

### ANSWER

This criteria is similar to a standard set across both NSW Health and the Whole of Government Performance and Management Services scheme. The standard criteria ask for demonstrated experience and performance in arrangements of the type being tendered for and help to ensure that all tender respondents can adequately address the specifications.

## QUESTION 11 – Page 23

ALFA D'AMATO: Chair, sorry to interrupt, if I may, just further to your inquiry in regards to the limited tenders, in the current policy, which I believe is also the procurement requirements, anything between \$250,000 and \$30 million requires three quotes. That is the limit they describe.

The CHAIR: If you could come back and let us know if anyone else tendered for that and who they were, that would be very useful. I come back to the point that one of the main concerns that has been raised in relation to the potential overuse and over-reliance of government on consulting firms is this usage for things that really should be within the core functions of government departments. **When we are looking at these ambulance contracts in particular—this Swift one of \$1.8 million for Deloitte is to determine the best location of ambulance stations, as far as I can tell, or for the central management of where ambulances should go across the State. How do we not have that capacity within NSW Health or NSW Ambulance? That seems like a very core function of Health in this State, don't you think?**

PHIL MINNS: I think Ambulance will have a view about how it needs to organise its future network of stations. Both Alfa and I have not had any involvement in that tender matter. We need to see what they have requested, which we are happy to do.

### ANSWER

NSW Ambulance did not contract Deloitte to determine the best location of ambulance stations. Recommendations for ambulance station locations were done prior to the engagement of Deloitte. NSW Ambulance take advice from their internal Service Planning team when considering where ambulance station should be located.



## QUESTION 12 – Page 22-23

The Hon. PETER PRIMROSE: So there would be guidelines that would have been provided to people who were looking at developing this needs analysis?

PHIL MINNS: I think we need to go and look at the case.

The Hon. PETER PRIMROSE: I am just trying to understand. "NSW Health procurement procedures encourage staff to undertake a needs analysis," so there must be guidelines that were used to enable them to do that.

ALFA D'AMATO: Yes.

**The Hon. PETER PRIMROSE: "Staff are also required to access value for money," in line with the NSW Procurement Board definition. So there must be guidelines provided.**

ALFA D'AMATO: Yes, absolutely.

**The Hon. PETER PRIMROSE: Can we get a copy of those?**

ALFA D'AMATO: I think that the answer is likely to be more in regards to the standard commercial framework, which is managed by NSW Procurement, which allows to enter into this contract with limited tender approaches, where they specify the cap rates and what is the mix—the value—in respect of the consultancy.

**The Hon. PETER PRIMROSE: I would like a copy of those guidelines that are given to staff.**

The CHAIR: We are talking about a \$1.8 million contract here. You would think that at least some point Ambulance would—and my understanding is that even though it's an Ambulance contract, it's something that NSW Health has to sign off on, ultimately. You would assume that a needs analysis of some sort had been put up to a higher level before this got signed off. This is a significant percentage of that ministry spend.

ALFA D'AMATO: If I can, I will make two comments. One is that all the frameworks are in the policy. I am more than happy to provide the policy and the procedures. The other part that I also think we need to acknowledge is the complexity around—as I understand it, 30 stations were announced to be deployed so that they could improve the ambulance performance. I'm not an expert at that so I'm more than happy to take that on notice, but I do need to acknowledge the complexity of the piece of work from the ambulance side and the fact that NSW Ambulance is not in the business, as Phil has mentioned, to do this on a day-to-day basis.

The CHAIR: You would think that the personnel, though, within the ambulance service would be very well placed to help advise on that. My understanding is they're not even consulted.

...

**The Hon. PETER PRIMROSE: Can I just confirm that you have taken on notice to give us those guidelines?**

ALFA D'AMATO: Yes.

## ANSWER

A variety of guidelines are available to NSW Health staff regarding value for money. This guidance can be found in the NSW Health Procurement Procedures and Procurement Portal, [buy.nsw](http://buy.nsw.gov.au), and the Performance and Management Services scheme standard commercial framework. Please note attached documents:

- Procedures value for money excerpt (Tab A)
- Needs assessment tool (Tab B)
- Buy.nsw value for money page (Tab C)
- Benefits Realisation Management Framework (Tab D)
- TPP18-06 Government Business Case Guidelines (Tab E)
- TPG23-08 NSW Government Guide to Cost-Benefit Analysis (Tab F)
- P&MS scheme standard commercial framework (Tab G)



### QUESTION 13 – Page 24

The CHAIR: Perhaps we could ask you to come back on notice with the percentage of consulting contracts where a post engagement evaluation has been undertaken and also how many of them were seen to be unsatisfactory.

ALFA D'AMATO: Sure.

### ANSWER

NSW Health staff routinely meet with suppliers toward the end of a contract to confirm that all project milestones have been met and to provide feedback on the services delivered, prior to the final invoice being paid. NSW Health is working with NSW Treasury to adopt the Vendor Management System that is being implemented through NSW Procurement, which will enable an improved approach to formal record keeping.

### QUESTION 14 – Page 25

The CHAIR: Just before I turn to the local health district structure again, **could you take on notice what your average annual spend was on consulting firms prior to 2011 when those health reforms came through?** That would be very useful—just maybe in the five years prior.

PHIL MINNS: Chair, if I could clarify that, we will be able to give you a global number, but because we moved from a different structural base of area health services to the 15 LHDs, I think there will be quite a lot of difference in what we're measuring in those time frames.

The CHAIR: Understood. Maybe just state the limitations in the answer so that we can work out how we might or might not compare it. Which consultants were involved in advising on those NSW Health reforms in 2011?

PHIL MINNS: I cannot answer that, Chair. We can take it on notice. I imagine we can find out.

### ANSWER

Financial year	NSW Health total consulting services spend (\$M)	Total expense budget (\$M)	Consultant expense as a percentage of total expense budget
2006	10.8	9,144	0.12%
2007	13.4	11,565	0.12%
2008	17.4	12,379	0.14%
2009	16.3	14,081	0.12%
2010	17.7	15,337	0.12%

### QUESTION 15 – Page 26

The CHAIR: I understand that the boards are appointed by the Minister at the time—those appointments are made by the Minister at the time. The chair is appointed by the board as a whole but signed off by the secretary.

PHIL MINNS: No, the chair is also appointed by the Minister.

The CHAIR: Okay, so the chair is appointed by the Minister.

PHIL MINNS: It's the deputy chair who can be—I would have to check, actually.

## ANSWER

The Minister appoints members of Local Health District Boards, as per the criteria set out in section 26(3) and 26(4) of the *Health Services Act 1997*. The Minister appoints the Chair of the Board under section 26(7) and the Deputy Chair under the provisions of Schedule 4A, clause 2 of the Act. Deputy Chairs may also be appointed by the relevant Chair of a Board, under delegation from the Minister. This delegation has been established to assist in maintaining board functions in times of member absence, illness or other unforeseen circumstance.

## QUESTION 16 – Page 27

The Hon. Dr SARAH KAINE: If I could interrupt just for a relevant point—within that process you would have then an analysis of board composition, including backgrounds, that you provide to the Minister so that the balance of the board could be looked at?

PHIL MINNS: So that it meets what is specified in the Act as the necessary range of capabilities. Yes.

The Hon. Dr SARAH KAINE: And that includes background?

PHIL MINNS: Yes. If you were to lose particular members of the board who were there as having defined capability sets, then we would put forward names from the EOI list to the Minister's office that met that gap.

**The Hon. Dr SARAH KAINE: Are we allowed to request that analysis over time? Obviously not the vetting process itself but the list that you provide?**

**PHIL MINNS: The list of names?**

**The Hon. Dr SARAH KAINE: The names and the background.**

PHIL MINNS: I will take it on notice. I'm not sure if there are any privacy rights associated with people who have completed the EOI. There may be. I'll need to check.

## ANSWER

The Minister is provided with a package of information as part of the regular appointment process. This package includes the:

1. current appointment listing for the relevant board/s
2. capability profile for the relevant board/s, linking each current member with the appointment criteria established by section 26 of the *Health Services Act 1997*
3. information on the individual candidate, including information they may have submitted through an expression of interest process, their latest resume and any additional information which may have been requested from them relevant to the specific appointment
4. any additional information that may have been provided by the relevant Board Chair for consideration during the appointment process.
5. outcomes of background probity checks performed by the Ministry – these include matching candidates against the ASIC Bankruptcy register, ASIC Banned and Disqualified People register, ASIC Enforceable Undertakings register and the NSW Government Register of Lobbyists.

Note, the finalisation of an appointment is subject to the completion of a criminal records check and the resolution of any matters which this may identify. These checks are completed by the LHD/SN as the final stage of the appointment process.

## QUESTION 17 – Page 29

The Hon. MARK BUTTIGIEG: The question was very straightforward and simple. Is the perceived conflict—and I don't think anyone would seriously argue there is no perception, in that situation, of a conflict. Surely any reasonable person would perceive there could potentially be a conflict. Is it actually pointed out or is it left to the Minister to infer from reading through the CVs? And is that still the case?

PHIL MINNS: I'd have to go back and check what advice was given to the Minister. As I said, we are not recommending, we are responding to—

The Hon. MARK BUTTIGIEG: I understand.

PHIL MINNS: There would have been a brief to the Minister at the time that would have dealt with that appointment and other appointments, and I'd have to check to see what offers contained.

## ANSWER

Responded under Question 18

## QUESTION 18 – Page 29

The CHAIR: Just on that, if you could also take on notice looking at—there are a number of them. There are at least—I think I found nine across just the metropolitan health districts where there has been a very clear connection with one of those big four consulting firms. If you could check what was said in relation to that. I'm very interested if there was a particular flag for conflict of interest or any other issues raised in that advice.

## ANSWER

The Ministry has reviewed the resumes of all current sitting members and identified five current board members with previous engagement with the consulting firms of KPMG, Ernst & Young, Deloitte and PwC.

Board members are advised of their obligations as members as part of their onboarding. Identification of a potential conflict of interest is to be made under the framework established by [NSW Health Policy Directive PD 2015 045 Conflict of Interest and Gifts and Benefits](#). If a potential conflict is identified, it is required to be managed according to the requirements of the policy and also giving consideration to the obligations of appointed members under the *NSW Health Code of Conduct*, the *NSW Government Boards and Committees Guidelines* and the *Appointment Standards for Boards and Committees in the NSW Public Sector*.

## QUESTION 19 – Page 29

The Hon. MARK BUTTIGIEG: Can I just get this on the record too—take it on notice if you like, but my specific question is: Would the current processes require the department to specifically call out the perceived conflict of interest?

PHIL MINNS: We'll take it on notice.

## ANSWER

The current process requires a potential conflict to be identified and assessed as per the requirements of the relevant policy frameworks discussed in response to question 18. A copy of the Policy Directive is attached above. The Minister would be advised of the outcomes of an assessment where it may impact on the appointment process.

## QUESTION 20 – Page 29

The Hon. SUSAN CARTER: Can I just ask—perhaps take it on notice—about quantum. Do you have any figures on what percentage of the local health district budget is spent on consultants.

## ANSWER

See response to Questions 1, 2 and 14.

### QUESTION 21 – Page 30

The CHAIR: That ICAC report also refers to refusing to allow people to also work in employment elsewhere where it's likely to conflict with their duties as an official, especially when that official—in this case, a board member—has financial delegations or influence over expenditure.

The Hon. SCOTT FARLOW: I think you just told us they don't have financial delegations.

The CHAIR: Is that what we're absolutely saying? You're saying that an LHD board that decides to hire PwC, for instance—

The Hon. SCOTT FARLOW: The board doesn't decide it.

The CHAIR: Well, that's not what the minutes are implying, and I've got all of the South Eastern Sydney Local Health District board minutes here. They talk about how the board has issued a request for tender to PwC. They talk about how the board has appointed PwC to do work for the district. Are you saying that's not what happens?

PHIL MINNS: It's a case that is before my time. I will need to take it on notice.

## ANSWER

South Eastern Sydney Local Health District undertakes all procurement consultant appointments, including this instance, consistent with [NSW Health Policy Directive PD2022 020 NSW Health Procurement](#).

Submissions are reviewed by a selected panel which makes recommendations to the Chief Executive who is the legal authority to enter into agreements, including with consultants. The District Board is notified of decisions made by the Chief Executive if required. The District Board plays no part in the engagement of consultants.

To further clarify, NSW Health Local Health Districts are statutory corporations under the legislation that establishes them. The person who acts on behalf of the corporation in the legal sense is the Chief Executive. The Board has a set of statutory functions involving oversight of the performance of the Local Health District but has no legal authority to act on behalf of the District. This is the role of the Chief Executive. This is also the reason why there is no financial delegation given to the Boards.

### QUESTION 22 – Page 31

The CHAIR: I think we'll come off that bit then and maybe just zoom back out to health generally. When, again, looking at that potential for conflicts of interest in terms of being exposed to information and taking that information and using it elsewhere, given the huge numbers of people within NSW Health who were previously at a consulting firm or who then go directly on to a consulting firm—I could give you so many examples of this. Mary Foley is a great one, but I could list for you a dozen other people who have just gone straight from consulting to NSW Health and back out to consulting. **What measures do you put in place to ensure that they are not taking information with them directly into their new positions, from NSW Health?**

PHIL MINNS: I would probably need to find for you the end-of-employment separation process that operates.

## ANSWER

All employees, contractors and consultants who undertake work for NSW Health are bound by the [Public Service Commission's Behaving Ethically](#) guide, 2022. Clause 2.2 **The Code of Ethics and Conduct for NSW government sector employees** outlines that the purpose of the Code is to identify mandatory requirements and best practice conduct for all government sector employees

which is consistent with Part 2 of the *Government Sector Employment Act 2013* (GSE Act) (the Ethical framework for the government sector).

The Code applies at all times when employees are acting in the course of, or in connection with, NSW government sector employment. The Code outlines the guiding principle for Integrity is to 'place the public interest over personal interest'.

In addition, all employees, contractors and consultants who undertake work for NSW Health are bound by the [NSW Health Policy Directive PD2015\\_049 NSW Health Code of Conduct](#). Specifically, Clause 4.5.4 - '*Not disclose, use or take advantage of information obtained in the course of official duties, including when they cease to work in NSW Health.*'

The NSW Health Policy Directive PD2022\_020 NSW Health Procurement Clause 3.1 Ethical and professional conduct applies to the procurement of goods and services of any kind by NSW Health agencies. This policy directive references compliance with the following policy directives:

- [NSW Health Policy Directive PD2015\\_049 NSW Health Code of Conduct](#) and
- [NSW Health Policy Directive PD 2015\\_045 Conflict of Interest and Gifts and Benefits](#)

In addition to clause 3.1, Clause 7.3.5 outlines NSW Health agency requirements at contract closure stage. This clause outlines record management requirements that include ensuring all '*conflict of interest declarations and any other probity-related documentation*' is stored in the agency's relevant records management system.

NSW Health's end of employment procedures ensures that all employees, contractors and consultants who have access to NSW Health systems to enable them to fulfil their roles, have system access removed on their last working day.

## QUESTION 23 – Page 32

The CHAIR: Has anyone ever raised with you a concern about conflicts of interest of a consultant, whether they are within NSW Health doing some sort of work or on a board?

ALFA D'AMATO: Not personally.

The CHAIR: With Health? Maybe take it on notice.

ALFA D'AMATO: Okay.

## ANSWER

NSW Health Staff are responsible for identifying and declaring conflicts of interest in accordance with the [NSW Health Policy Directive PD 2015\\_045 Conflict of Interest and Gifts and Benefits](#).

Options to manage conflicts of interest are dependent on the type of conflict, the circumstances of the matter and an objective assessment of it. A high level, preliminary search of NSW Ministry of Health records has not identified a complaint of this nature at this stage. The timeframe provided to return this response has not allowed for a full search of NSW Health records.

## QUESTION 24 – Page 32

The CHAIR: Are you able to take on notice to find out whether that has occurred at any time in relation to a local health district board?

PHIL MINNS: Where it's a conflict potentially about being—

The CHAIR: Where there's a potential conflict of interest—it doesn't have to be a consultant—of any kind.

PHIL MINNS: We won't be able to do that by the twenty-third because we would have to go out and ask every district to do a response.

The CHAIR: Not at a district level; at a Health level, where it's come into the ministry.

PHIL MINNS: The ones that have come to us, yes, we could probably do that in 10 days.

## ANSWER

The NSW Health policy directive [NSW Health Policy Directive PD 2015\\_045 Conflict of Interest and Gifts and Benefits](#) outlines the requirements on Local Health Districts in identifying, assessing and managing conflicts. There is an expectation that any such matter will be assessed by the District and managed locally in accordance with the requirements of the policy framework.

Where concerns arise that involve Board members that cannot be addressed locally, they are referred to the Ministry. A preliminary review of information held by the Ministry has identified two instances of a matter being referred to the Ministry where it has involved a Board member. One matter was referred in 2019, the other in 2021 and in both of these instances, the issue raised was not substantiated.

## QUESTION 25 – Page 33

The Hon. MARK BUTTIGIEG: This needs analysis that is required to be performed before a consultancy firm is engaged—just to clarify, that's both for the ministry and the LHDs?

ALFA D'AMATO: Yes.

The Hon. MARK BUTTIGIEG: Can I ask what sort of information is called for as part of that needs analysis?

ALFA D'AMATO: I can provide that on notice if you want all the details. Otherwise, I can make reference to the procedure that we have issued, that guides all the information that we ask the team to consider in regard to their needs analysis. Identifying the business needs requires them to assess whether the spend is required; identify and understand your internal stakeholders' needs; engaging those stakeholders to win their commitment to your procurement strategy because they'll require them to also be part of the potential evaluation panel; brainstorm different ideas on what your agency requires from the procurement; exploring alternatives for the delivery of the same outcome; and determining and agreeing on the business needs. That's broadly what we ask the team to consider as part of the first step on getting started.

## ANSWER

See response to question 12

## QUESTION 26 – Page 33-34

The Hon. Dr SARAH KAINE: I have one final question. Mine is just an accounting thing, and you might be able to answer it super-quickly, but it's for someone who's perhaps not as well versed. In going through the financial statements of the local health districts, there seems to be a change that occurred between 2014-15 and 2015-16. I'm not anticipating that you're—it might still be an easy answer for you to come back to me.

ALFA D'AMATO: I'll give it a go.

The Hon. Dr SARAH KAINE: In 2014-15, consultancies reported the spend—I've checked across them all—in two line items, "capital works" and "other", and then it wasn't. It started to be consolidated into just the one. I looked at if there was a change in accounting standards. I couldn't see anything there. I just wondered what it would be that had prompted the change across all the area health districts.

ALFA D'AMATO: I'll go back in regard to what prompted, but I suppose this connects back to the comment the Auditor-General made this morning, in regard to the difficulties at the time to account for the whole spend of consultants because some is capitalised versus what is reported.

The Hon. Dr SARAH KAINE: I just wonder why, because it's a devolved system—we kept being told it's a devolved system—each area health service that year changed the way they accounted, from two to one.

ALFA D'AMATO: It's a good point, but I need to remind you that, yes, it's devolved because locally they need to make this assessment, whether they do need to spend the resources in certain areas, but ultimately there is an overall government framework, which we are cascading down. That's what we attempt to do with our policy, which refers to the NSW Procurement.

**The Hon. Dr SARAH KAINE: Would you mind seeing if there was some change in policy that prompted that?**

ALFA D'AMATO: I will.

The Hon. Dr SARAH KAINE: It was just an intriguing kind of change that was across the board. So it would be good to know why.

ALFA D'AMATO: I'll have a look.

## ANSWER

The aggregated consultant reporting was a management decision. The capital portion of consulting costs is typically capitalised as part of the asset in accordance with accounting standard AASB 116.

## Attachments

Tab	Title
A	Procedures value for money excerpt
B	Needs assessment tool
C	Buy.nsw value for money page
D	Benefits Realisation Management Framework
E	TPP18-06 Government Business Case Guidelines
F	TPG23-08 NSW Government Guide to Cost-Benefit Analysis
G	P&MS scheme standard commercial framework



## 1. Value for money

Achieving 'value for money' is not the same as getting the lowest price.

This involves making a balanced assessment of financial and non-financial factors such as quality, fitness for purpose, capability, capacity and the potential benefits and risks.

Consider ways to integrate the principles of value based healthcare into the value for money assessment through outcomes-focused specifications, evaluation criteria and contractual performance measures.

You may assess value by using an equation like:

$$\text{Lifetime benefits} - \text{Total lifetime costs} = \text{Value for money}$$

# Needs Assessment Tool - Instructions

## Objective

To breakdown the business needs into meaning categories. To order and weight these needs to understand their relative importance to the business. The results of the analysis should then be used to challenge the need in the formulation of the specification.

## Directions

### Sheet 1 - PRACTISE Needs

- 1 Firstly, breakdown your business needs into the suggested categories represented by the mnemonic **PRACTISE**.

#### PRACTISE Needs Categories

- 2 Identify how the needs could change over the 3 time periods in the table and complete the cells for the relevant need.

	Current Position	Next 12 months	Next 2-3 years

- 3 Summarise each need incorporating the changes over time into the right hand summary column.

Needs Summary	

### Sheet 2 - Ranking Matrix

- 4 Input the needs summary into the rows with the red arrow. These are the **RED** needs.

RANK	Input Needs Summary Here: ↓
1	Need A
	Need B

- 5 These needs will be transposed into the vertical columns. These are the **BLUE** needs.

- 6 For each need ask the question...

**Is the red need more important than the blue need?**

If 'Yes' enter the value '1' in the white cell where the red need intersects with the blue need . If the red need is less important , enter a "0" .

- 7 ..and use the drop down to input a "1" or "0" into the

corresponding white cells.

	Need A	Need B	Need C
Need A		1	0
Need B	0		1
Need C	1	0	

- 8 The rank of each need will be calculated on the left hand column.

RANK	Input Needs Summary Here: ↓
3	Need A
2	Need B
1	Need C

- 9 A suggested weighting is attributed to each need in the right hand column.

1
2
3

# Value for money

In every procurement, your primary consideration should be achieving value for money.

## On this page

- [Value for money isn't the same as getting the lowest price](#)
- [Assess value for money](#)
- [Apply a monetary value](#)
- [Consult potential customers](#)
- [Consider innovation and collaboration opportunities](#)
- [Related resources](#)



## What you need to know

1. Achieving value for money isn't the same as getting the lowest price.
2. You should take a big picture view that compares lifetime benefit to the lifetime cost.
3. Assessing value for money means looking at the upfront and after-purchase costs and benefits, as well as considering fitness for purpose.
4. You need to apply a monetary value to potential costs, benefits and risks.
5. You should consider whether technology, innovation and citizen engagement can help deliver value for money.

## Value for money isn't the same as getting the lowest price

The term 'value for money' means different things to different people. But as a government buyer, you should always take a big-picture view.

This means looking at the total benefit to the community and measuring and costing it in the most transparent way. It's not just about securing the lowest price or the highest quality.

[back to top](#)

If you have limited funds, you may find a low-cost option that meets your minimum quality requirements is enough. But you always need to consider the value over the goods or services' entire lifetime. This includes everything from upfront installation or construction to maintenance and exit costs, as well as indirect costs and benefits.

For instance, you may deliver economic value through cost-saving innovations or downstream job-creation.

# Compare lifetime benefits against lifetime costs

Broadly speaking, you can determine value by comparing lifetime benefits (non-financial factors) against lifetime costs (financial factors). As an equation, it looks like this:

**Value for money = total lifetime benefits - total lifetime costs**

Measuring these means considering factors such as cost, quality, fitness for purpose, capability, capacity, risk and more.

## Assess value for money

Procurement benefits, costs and risks generally fall into 3 categories:

[Expand all](#)

### Upfront

**Savings.** How will your offering reduce costs immediately or over time? You must be able to verify any savings.

**Changes to revenue.** Look at new revenues rather than those you already achieve.

**Costs avoided.** What costs – often called ‘opportunity costs’ – would you face if your procurement didn’t go ahead?

**Transitioning-in costs.** What are your setup costs, including the direct and indirect costs of commissioning and maintaining technology and staff?

**Risks.** What are the commercial, business and operational risks? What about the risk of operations being disrupted?

### After-purchase

Ongoing benefits and costs are often called the ‘total cost of ownership’, ‘whole-of-life’ or ‘whole-of-contract’ benefits and costs. These are generally easier to measure in services contracts involving people than in those for physical goods.

You should look beyond recurring costs such as rentals and licence fees to consider the following factors.

**Contract period.** Benefits and costs often change over time. Is technology likely to change during the contract term? What about agency preferences?

**Transactional costs.** How much will it cost to maintain and operate the goods or services over the contract term?

**Transitioning-out costs.** Is there an end-of-contract benefit? Are remediation costs likely?

**Contingency costs.** Are there early termination fees? What will it cost you if a supplier fails to deliver?

**Contract management risks.** Go beyond supply and business continuity risks. Are there any risks to your reputation?

### Fitness-for-purpose

Estimating fitness for purpose involves analysing the non-price elements of the contract. You could do this by answering the following questions.

**Are you in line with government-wide procurement policies?** For instance, are you following government policy on promoting competition?

**Do the goods or services really meet your need?** Will you have to make adjustments? If so, what's the likely cost? Don't buy more than you require.

**Are you complying with relevant standards and specifications?** What are the costs of compliance or non-compliance? What's the risk of non-compliance?

**Can the supplier deliver?** What's their availability, reputation and track record? Don't double count benefits you've identified in contingency costs.

**How flexible are the goods or services?** Assess any potential for improvement and innovation during the contract term. What impact will this have on cost?

## Apply a monetary value

After you've identified the potential costs, benefits and risks, you'll need to assign a monetary value to each of them. This isn't always easy. But keep in mind the following:

**Every procurement activity has an opportunity cost.** Your resources are limited. What opportunities are you foregoing to procure the goods or services?

**Include everything.** Make sure you assign a monetary value to all benefits and costs you've identified.

**Don't focus only on the benefits.** Ignoring the costs will lead to errors in your calculations.

**Consider the entire lifecycle.** Assess costs and benefits across the lifecycle of the goods or services. Don't forget about disposal of goods, where applicable.

**Can you include broader community benefits?** Community benefits are only relevant where they align with government priorities, policies or programs. This is usually more relevant to large procurements.

**Costs and benefits aren't always commodity-based.** For instance, buying teleconferencing equipment may reduce the need to spend money on travel. Look out for these knock-on benefits and quantify them.

## Consult potential customers

When you're planning to procure goods or services that citizens will consume, consider consulting potential customers. Robust and valid citizen engagement can help you understand the user and give you informed feedback.

If you take this approach, be sure to:

ensure suppliers can't influence the outcome

test several options against pre-set criteria, not just your preferred option

consider using a control group to give you a baseline view.

## Consider innovation and collaboration opportunities

You may find emerging technology and the collaborative economy can help you cut costs and boost benefits. Consider whether:

any digital solutions could help you cut costs or increase benefits over the lifecycle  
buying through a collaborative platform is a better approach than traditional procurement  
you could improve the value of underused assets through the collaborative economy.

## Related resources

You'll find more information and guidance on how to measure value for money in the following documents.

[Benefits Realisation Framework](#). A process for identifying, planning, managing and evaluating an investment's likely benefits.

[TPP18-06 Government Business Case Guidelines](#) (PDF). NSW Treasury guidelines for developing a business case.

[TOO17-03 NSW Government Guide to Cost-Benefit Analysis](#). NSW Treasury policy and guidelines for approaching and appraising the evaluation of public projects, programs and policies.

[Public Works and Procurement Act 1912](#)

[Government Sector Finance Act 2018](#)

## Previous

◀ Procurement objectives

## Next

Fair and open competition ▶

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# Benefits Realisation Management Framework

The Benefits Realisation Management Framework provides best practice principles and concepts drawn from proven practice in setting up and managing programs that are transferable across NSW agencies.

The Benefits Realisation Management Framework informs investment decisions and establishes plans to realise intended benefits.

## What is Benefits Realisation Management?

BRM informs investment decisions and establishes plans to realise intended benefits. Best practice principles, processes and techniques help stakeholders to clearly articulate:

- why an investment is needed?
- what are the strategic outcomes of a program?
- what are the measurable benefits?
- when will the benefits be realised?
- who owns the benefits?

## What is the purpose of the Framework?

The purpose of the Benefits Realisation Management Framework is to provide:

- best practice principles, processes and techniques building upon proven practice across NSW Government
- a structured approach to communicating the need for investment, identifying benefits and organisation responsibilities
- consistent terminology and benefits categories
- guidance for program sponsors and benefit owners.

## Who is it for?

The Benefits Realisation Management Framework is for:

- anyone interested in how to identify and value benefits when allocating public funds including change managers, project managers and business analysts
- those interested in implementing benefits management practice including program sponsors, directors, managers and program management office (PMO) staff across NSW Government.

## What's in it for me?

The Benefits Realisation Management Framework can help to:

- develop a business case
- identify benefits
- collaborate with stakeholders
- improve the chances of successful business change
- assess and mitigate the risks arising from poor forecasting or program delivery issues
- inform program evaluations.

## Downloads

### Part 1: Principles

Part 1 includes a suite of ten principles for best practice. Benefits Realisation Management Rationale is explained for each principle as well as associated implications.

**[Part 1: Principles \(PDF 175.45KB\) \(https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20principles.pdf\)](https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20principles.pdf)**

### Part 2: Process

Outlines the four high-level phases associated with the Benefits Realisation Management process. This includes the objectives of each phase, key questions to be asked, processes to be undertaken and key deliverables.

For each of the key deliverable there are templates available that can assist and speed up the development of your benefits realisation management deliverables (see Templates section)

**[Part 2: Process \(PDF 461.22KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20process.pdf)** (<https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20process.pdf>)

## Part 3: Guidelines

The purpose of Part 3: Guidelines is to provide an introduction to benefits management practice to assist program management practitioners to implement a benefits process.

**[Part 3: Guidelines \(PDF 325.5KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20guidelines.pdf)** (<https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20guidelines.pdf>)

## Part 4: Implementation

Part 4: Implementation provides information on how to adapt the deliverables and techniques explained in Part 2, Part 3 and templates provided to meet stakeholder needs.

Advising on what should be considered before starting, what analysis will help implementation plans and recommendations for adapting benefits management deliverables. The intent is to provide practical information to:

- help make the benefits analysis in the business case more robust
- make the process and deliverables more relevant to stakeholders
- help embed the benefits management planning and sustain progress towards realisation
- provide information and data to support an evaluation of the program, either as part of the evaluation phase or as an independent program evaluation.

**[Part 4: Implementation \(PDF 266.5KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20implementation.pdf)** (<https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20implementation.pdf>)


## Part 5: Glossary

The glossary provides explanations of key terms and acronyms. It also has a section with references to key policy documents and guides and specifies related best-practice literature.

**[Part 5: Glossary \(PDF 206.66KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20glossary.pdf)** (<https://www.nsw.gov.au/sites/default/files/2020-11/brmf%20glossary.pdf>)

# Related policy documents

## NSW Treasury

- [Business case guidelines](https://www.treasury.nsw.gov.au/information-public-entities/business-cases)  (<https://www.treasury.nsw.gov.au/information-public-entities/business-cases>).
- [Guide to Cost Benefit Analysis](https://www.treasury.nsw.gov.au/nsw-economy/economic-frameworks)  (<https://www.treasury.nsw.gov.au/nsw-economy/economic-frameworks>).

## NSW Department of Premier and Cabinet

- [Program Evaluation Guidelines](https://www.dpc.nsw.gov.au/tools-and-resources/evaluation-toolkit/evaluation-in-the-nsw-government/)  (<https://www.dpc.nsw.gov.au/tools-and-resources/evaluation-toolkit/evaluation-in-the-nsw-government/>).

## NSW Department of Customer Service

- [Government Digital Strategy](https://www.digital.nsw.gov.au/beyond-digital/ministers-foreword)  (<https://www.digital.nsw.gov.au/beyond-digital/ministers-foreword>).
- [ICT Assurance](https://www.digital.nsw.gov.au/policy/ict-assurance)  (<https://www.digital.nsw.gov.au/policy/ict-assurance>).

## Infrastructure NSW

- [Infrastructure Investor Assurance Framework](https://www.digital.nsw.gov.au/policy/ict-assurance)  (<https://www.digital.nsw.gov.au/policy/ict-assurance>).

## Templates

- [Benefits Realisation Management Strategy \(DOC 201KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/Benefits-Mgt-Strategy_TEMPLATE_0.doc) ([https://www.nsw.gov.au/sites/default/files/2020-11/Benefits-Mgt-Strategy\\_TEMPLATE\\_0.doc](https://www.nsw.gov.au/sites/default/files/2020-11/Benefits-Mgt-Strategy_TEMPLATE_0.doc))
- [Benefits Plan \(DOC 202.5KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/Benefits-Mgt-Plan_TEMPLATE_0.doc) ([https://www.nsw.gov.au/sites/default/files/2020-11/Benefits-Mgt-Plan\\_TEMPLATE\\_0.doc](https://www.nsw.gov.au/sites/default/files/2020-11/Benefits-Mgt-Plan_TEMPLATE_0.doc))
- [Benefits Realisation Register \(XLSX 60.54KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/Benefits%20Register_TEMPLATE.xlsx) ([https://www.nsw.gov.au/sites/default/files/2020-11/Benefits%20Register\\_TEMPLATE.xlsx](https://www.nsw.gov.au/sites/default/files/2020-11/Benefits%20Register_TEMPLATE.xlsx))
- [Benefits Profile \(DOCX 65.86KB\)](https://www.nsw.gov.au/sites/default/files/2020-11/Benefit%20Profile_TEMPLATE.docx) ([https://www.nsw.gov.au/sites/default/files/2020-11/Benefit%20Profile\\_TEMPLATE.docx](https://www.nsw.gov.au/sites/default/files/2020-11/Benefit%20Profile_TEMPLATE.docx))



## What would a good Benefits Realisation report look like?

A good Benefits Realisation report demonstrates sound preliminary work in the early framing stage around Benefits dependency mapping. Once benefits are identified and recorded in the Benefits register, they should be regularly monitored and reported against. Good Benefits Realisation Management is embedded into project management continuous improvement approach turned into Business As Usual.

## If I have done Benefits Realisation for my project, is there a need to also do Evaluation?

No, not necessarily. Benefits Realisation may be all that is required to report on a project's performance and achievements.

Evaluation would be required only if there is a case to provide robust evidence against hard to measure outcomes.

## How much should I set aside to conduct Benefits Realisation for my project compared to a Program Evaluation? Is Benefits Realisation overkill for small low budget projects?

Benefits Realisation doesn't have to be costly. The main investment is in the initial phase where key stakeholders assist in the identification of benefits that will be monitored along the way and potentially realised.

Evaluation can be more resource intensive, but it depends on the type of evaluation chosen. For instance, process evaluations can be quite straightforward in the types of methods used, e.g. document review, stakeholders' interviews.

## What do you see as the main distinction between benefits and outcomes?

An outcome (e.g. more efficient service delivery) is the result of the change derived from using the project's outputs (customer service training).

A benefit is the measurable improvement resulting from an outcome that is perceived as an advantage by one or more stakeholders (e.g. costs are reduced by 10%).

## Are benefits always financial?



No. Benefits can be financial or non-financial. Non-financial benefits might include things like improved capability or increased customer satisfaction.

## How can we maintain momentum in tracking benefits in later years?



This is indeed a challenge for Benefits Realisation, and even more for Program Evaluation which often considers outcomes that may take several years in the making. Monitoring of benefits and outcomes often stops after the completion of the project, in particular where projects relied on an ad hoc team and contingent workforce. As long as the appropriate governance arrangements are put in place, i.e. a senior executive is responsible for realising the benefit, the likelihood of that benefit being realised increases significantly.

However, organisations should set themselves up to measure benefits and outcomes when required for projects with longer term impact. In these cases, it is recommended to embed benefits or outcomes tracking in to monitoring or performance reporting systems, so that it doesn't stop with the project team.

Last updated: 17 November 2020



# Benefits Realisation Management Framework

## Part 1: Principles

This document is part of the NSW Government Benefits Realisation Management Framework. The structure of the Framework is as follows:

## **Part 1: Principles**

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## **Part 2: Process**

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## **Part 3: Guidelines**

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## **Part 4: Implementation**

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## **Part 5: Glossary**

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“Benefits Realisation Management Framework” Parts 1-5. An electronic version of this document is available at [www.nsw.gov.au/customer-service/publications-and-reports/benefits-realisationmanagement-framework](http://www.nsw.gov.au/customer-service/publications-and-reports/benefits-realisationmanagement-framework)

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Third Edition

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# Benefits Realisation Management Framework

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**A standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across NSW Government.**

---

## **The purpose of the Benefits Realisation Management Framework is to provide:**

- a framework of best practice principles and concepts drawn from latest experiences and proven practice in setting up and managing programs that is transferable across NSW Government agencies
- a standard approach for benefits realisation management for anyone not familiar with the subject matter
- consistent terminology and benefits categorisation
- introduction and guidance for program sponsors and business benefit owners.

## **The Framework:**

- is aimed at those who are interested in benefits realisation within NSW Government agencies, enabling them to adapt and tailor the guidance to their specific needs
- must be accessible by strategy groups, operational business areas and program/ project teams as well as by individual practitioners and benefit owners
- should help PMO practitioners improve their decision making and become better at implementing beneficial change.

# 1. Principles

**1** A benefit is a measurable improvement resulting from an outcome which is perceived as an advantage by a stakeholder.

---

**2** Benefits must be aligned to the organisation's strategic goals.

---

**3** Benefits need to be first understood as outcomes. Benefits are the reason an investment is made.

---

**4** Benefits must be measurable and evidence-based in order to demonstrate that an investment provides value.

---

**5** Benefits can only be realised through change and change can only be sustained by realising benefits.

---

**6** Benefits need to be owned by appropriate sponsors and managers, not by the program/project manager.

---

**7** Intermediate benefits are needed to realise end benefits (and are just as important).

---

**8** Benefits are dynamic; they need to be regularly reviewed and updated.

---

**9** Keep the number of benefits monitored and reported to a sensible, manageable number.

---

**10** Benefits management should be integrated with other organisational processes, including Project Management.

## 2. Principles expanded

### Principle 1

A benefit is a measurable improvement resulting from an outcome which is perceived as an advantage by a stakeholder

.....

#### Rationale

Benefits are the primary reason investments are made. Benefit Management starts with defining the problem, required business changes and the intended outcomes.

#### Implications

- a) A broad approach to the identification and categorisation of benefits is desirable to support a business case.
- b) Benefits should be understood and planned from a user-centric perspective.
- c) Non-financial benefits are not always easy to quantify.
- d) Care should be taken when giving financial values to non-financial benefits see NSW Treasury Guidelines on Cost Benefit Analysis.
- e) Digital capability supports the management of benefits identification, planning, realisation and evaluation.
- f) Dis-benefit can arise when an outcome is perceived as a disadvantage by one or more stakeholders. Dis-benefits should be considered and incorporated to provide a holistic view of the merits of a program.

### Principle 2

Benefits must be aligned to the organisation's strategic goals.

.....

#### Rationale

The outcomes and benefits realisation delivered by the change help achieve strategic goals.

Strategic goals describe how an organisation wishes to evolve.

#### Implications

If benefits are not aligned with strategic goals then their overall value must be questioned. Investment decisions must be based upon realisation of benefits that support the delivery of strategic goals. Projects and programs which are not properly aligned with the right strategies should not proceed (unless they are compliance related).

## 2. Principles expanded (cont.)

### Principle 3

Benefits need to be first understood as outcomes. Benefits are the primary reason an investment is made.

.....

#### Rationale

Ultimately it is the realisation of benefits which helps achieve one or more program/project outcomes. The benefits management cycle should start by identifying intended outcomes and benefits.

#### Implications

- a) Creating a benefits map collaboratively with stakeholders will help to identify the intended outcomes and benefits of a program.
- b) Failure to fully identify and understand benefits will result in a weakened business case.
- c) If benefits (and dis-benefits) are not fully identified and quantified within the business case, in alignment with strategic outcomes, then this may impair decision-making and adversely affect resource allocation.

### Principle 4

Benefits must be measurable and evidence-based to demonstrate value.

.....

#### Rationale

Benefits can either be financial or non-financial.

Financial benefits are readily quantifiable. Where non-financial benefits may not be quantifiable, a qualitative approach may be considered.

For service oriented benefits, user satisfaction could be measured using surveys.

For digital service benefits, enablement measures can be used for more information on benefit categories see Part 3.

#### Implications

- a) If initial baseline measures are not established then the extent of benefits realisation cannot be demonstrated.
- b) If benefits are not measured, or are not measurable, then insufficient evidence exists to justify the investment in the initiative.
- c) Projects or programs should not be claiming the same benefits. Double counting of benefits impacts the ability of senior management to make informed decisions.



## 2. Principles expanded (cont.)

### Principle 5

Benefits can only be realised through change and change can only be sustained by realising benefits.

.....

#### Rationale

Identifying who is impacted by the proposed change and collaborating with these stakeholders will support the implementation of lasting change and benefits realisation.

#### Implications

- a) Failure to successfully embedded change creates a risk that benefits will not be optimised.
- b) Failure to consider stakeholders change impact on organisational processes and technology may result in a new capability failing.
- c) Benefits management should be a collaborative activity with stakeholders.

### Principle 6

Benefits need to be owned by appropriate sponsors and managers, not by the program/project manager.

.....

#### Rationale

The benefits owner is the individual accountable to the program sponsor for the realisation of specified benefits within the program. Accountability and responsibility for benefit realisation is key for successful benefits management. It is important that responsibility for benefit realisation remains with those business units affected.

#### Implications

- a) Failure to formally assign accountability and responsibility for benefits creates a risk that benefits will not be fully realised.
- b) Benefit profiles assist benefit owners in understanding all the parameters of a benefit.
- c) Asking benefit owners to assign a confidence level for each benefit is good practice. The confidence level can be monitored and updated over time, to provide assurance that benefit realisation is on track.

## 2. Principles expanded (cont.)

### Principle 7

Intermediate benefits are needed to realise end benefits (and are just as important).

.....

#### Rationale

Monitoring intermediate benefits will give management confidence that benefits realisation is on track.

#### Implications

- a) There can often be critical dependencies between intermediate benefits and other subsequent benefits. Failure to realise intermediate benefits may indicate a risk to the overall benefits realisation.
- b) Unless intermediate benefits and their measures are monitored and reported upon, there is no opportunity for management to implement corrective actions (if need be).
- c) Non-financial intermediate benefits may lead to the realisation of a financial end benefits.

### Principle 8

Benefits are dynamic; they need to be regularly reviewed and updated.

.....

#### Rationale

Benefits identified at the commencement of the program life cycle will change over the life of the investment. Benefits register should be regularly reviewed and updated.

#### Implications

- a) Failure to regularly review and update benefits may lead to benefits being under or overstated.
- b) Any reduction in the overall value of benefits forecast needs to be clearly understood and communicated to senior management.

## 2. Principles expanded (cont.)

### Principle 9

Keep the number of benefits to a practical, manageable number.

.....

#### Rationale

Priority should be given to those benefits with the greatest likelihood of being realised.

#### Implications

- a) Failure to adequately identify benefits measures that provide best business value may lead to an overly complicated and time-consuming reporting.
- b) There is a risk that complex reporting may not be commensurate with the value of the benefits to be realised.

### Principle 10

Benefits management needs to be integrated with other organisational processes, including Project Management.

.....

#### Rationale

The new capabilities delivered by project and program management need to be understood in terms of their bringing about change and therefore benefits.

#### Implications

- a) Without active monitoring of benefits, senior management and other stakeholders cannot assure themselves that benefits will be delivered in full, or in a timely manner.
- b) Benefits realisation should be a standing agenda item at each Program Board meeting.
- c) Benefits management is at the heart of Program Evaluation. Identifying benefits early in the lifecycle will inform requirements for the evaluation phase or an independent program evaluation.
- d) Benefits management supports and can be aligned with relevant assurance requirements, including the following NSW Government ICT Assurance Framework, Recurrent Investor Assurance Framework and the Infrastructure Investor Assurance Framework.



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# Benefits Realisation Management Framework

## Part 2: Process

This document is part of the NSW Government Benefits Realisation Management Framework. The structure of the Framework is as follows:

## **Part 1: Principles**

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## **Part 2: Process**

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## **Part 3: Guidelines**

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## **Part 4: Implementation**

---

## **Part 5: Glossary**



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# Benefits Realisation Management Framework

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**A standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across NSW Government.**

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## **The purpose of the Benefits Realisation Management Framework is to provide:**

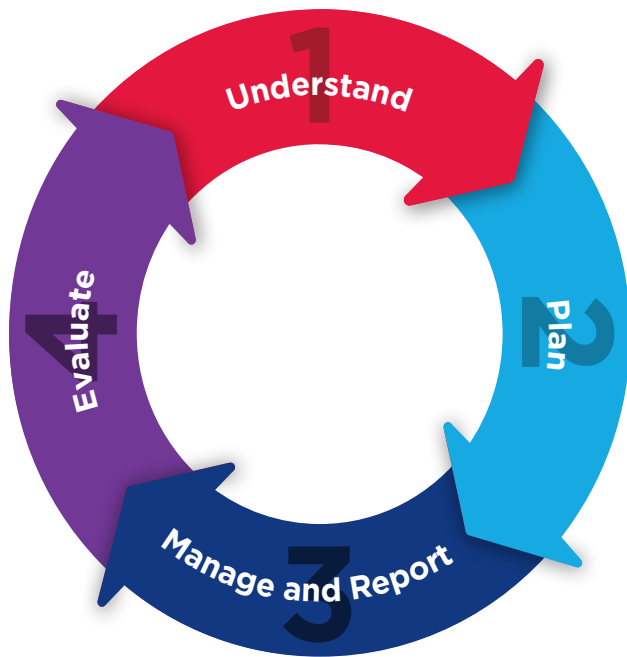
- a framework of best practice principles and concepts drawn from latest experiences and proven practice in setting up and managing programs that is transferable across NSW Government agencies
- a standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across NSW Government
- consistent terminology and benefits categorisation
- introduction and guidance for program sponsors and business benefit owners.

## **The Framework:**

- is aimed at those who are interested in benefits realisation within NSW Government agencies, enabling them to adapt and tailor the guidance to their specific needs
- must be accessible by strategy groups, operational business areas and program/ project teams as well as by individual practitioners and benefit owners
- should help PMO practitioners improve their decision making and become better at implementing beneficial change.



# 1. Benefits Realisation Management Process



The key to applying the framework is to understand your starting point. Have you got an approved business case or are you still in the process of developing a business case for your project or program?

When developing your own agency strategy or plan, we suggest you refer to this standard framework and use it for your Benefits Realisation Strategy and/or Plan when preparing one.

Not all tasks and deliverables may be relevant to your program or project, but at least you can use this standard approach to focus on developing your own content.

For each of the key deliverables we have developed a template that should greatly assist and speed up the development of your benefits realisation management deliverables.

The following sections outline the objectives/ definitions for each of the phases, a summary of the key questions to answer when developing a benefits framework, the key (recommended) tasks by phase which will lead to the key deliverables.

## 2. Benefits Realisation Management Process (cont.)

### Phase 1

## Understand

### Objective

Define vision, objectives and potential benefits ensuring alignment with strategic drivers.

#### Key questions:

- Have the vision/objectives/end state been articulated?
- Who will be impacted by the program?
- Have the stakeholders been identified?
- What are the benefits of the program?

### Process

- Articulate the vision/objectives/key principles
- Identify key stakeholders
- Identify benefits with stakeholders
- Map the outcomes and benefits with stakeholders
- Develop a benefits realisation strategy
- Obtain sponsorship buy in and ownership of benefits

### Deliverables

- Benefits Realisation Strategy
- 3 Column Analysis
- First draft benefits map
- Benefits Distribution Matrix

### Phase 2

## Plan

### Objective

Prioritise the benefits and business change required to determine a plan for achieving the objectives.

#### Key questions:

- What type of benefits will the program realise?
- Can benefits be measured? What are the measures and data source?
- Who should be responsible for realising each benefit?
- Have the baseline data and targets been agreed with benefit owners?
- Are there any risks relating to either the forecasting of benefits or delivery failures?

### Process

- Classify benefits
- Identify benefit measures
- Value benefits
- Create benefits register
- Develop benefits profiles
- Establish governance
- Confirm benefit ownership
- Develop benefits plan
- Inform business case

### Deliverables

- Benefits plan
- Benefits profiles (included in plan)
- Benefits register or benefit tracking tool
- Updated benefits map

### Phase 3

## Manage and Report

### Objective

Measure, analyse and understand the program outcomes to proactively support the delivery of benefits.

#### Key questions:

- Have any quick wins been realised?
- Has progress been reviewed against the business case?
- Has an effective and sustainable monitoring, data analysis and reporting process been established?
- Do benefit reports/dashboards meet the needs of different stakeholders?
- Are the responsibilities for ongoing managing and reporting documented in the benefits plan?

### Process

- Operationalise the benefits register or benefits tracking tool
- Agree final targets with benefit owners
- Monitor program process
- Review progress against business case
- Update benefits plan, benefit register or tracking tool
- Establish reporting on progress
- Handover benefits reporting and measurements to BAU team

### Deliverables

- First benefits report
- Updated benefits plan
- Updated benefits register

### Phase 4

## Evaluate

### Objective

Identify learnings from program activities to inform strategic decisions and priorities.

#### Key questions:

- Were the expected program outcomes realised?
- Do the benefit management deliverables provide sufficient evidence to evaluate the program?
- Has the transition to BAU been managed?
- Did the stakeholders realise the benefits they expected?
- Has progress towards the vision/end state been reported against?
- Have lessons learned been captured and communicated?

### Process

- Clarify the purpose and scope of the evaluation phase
- Review the benefits deliverables
- Conduct post-implementation review to inform corrective action
- Capture lessons learnt to inform continuous improvement

### Deliverables

- Updated benefits register
- Updated benefits report
- Business case variation report
- Lessons learned report

## 2. Benefits Realisation Management Process (cont.)

The following diagram provides an overview of the process flow and deliverables to understand, plan, manage and report and evaluate the realisation of benefits.

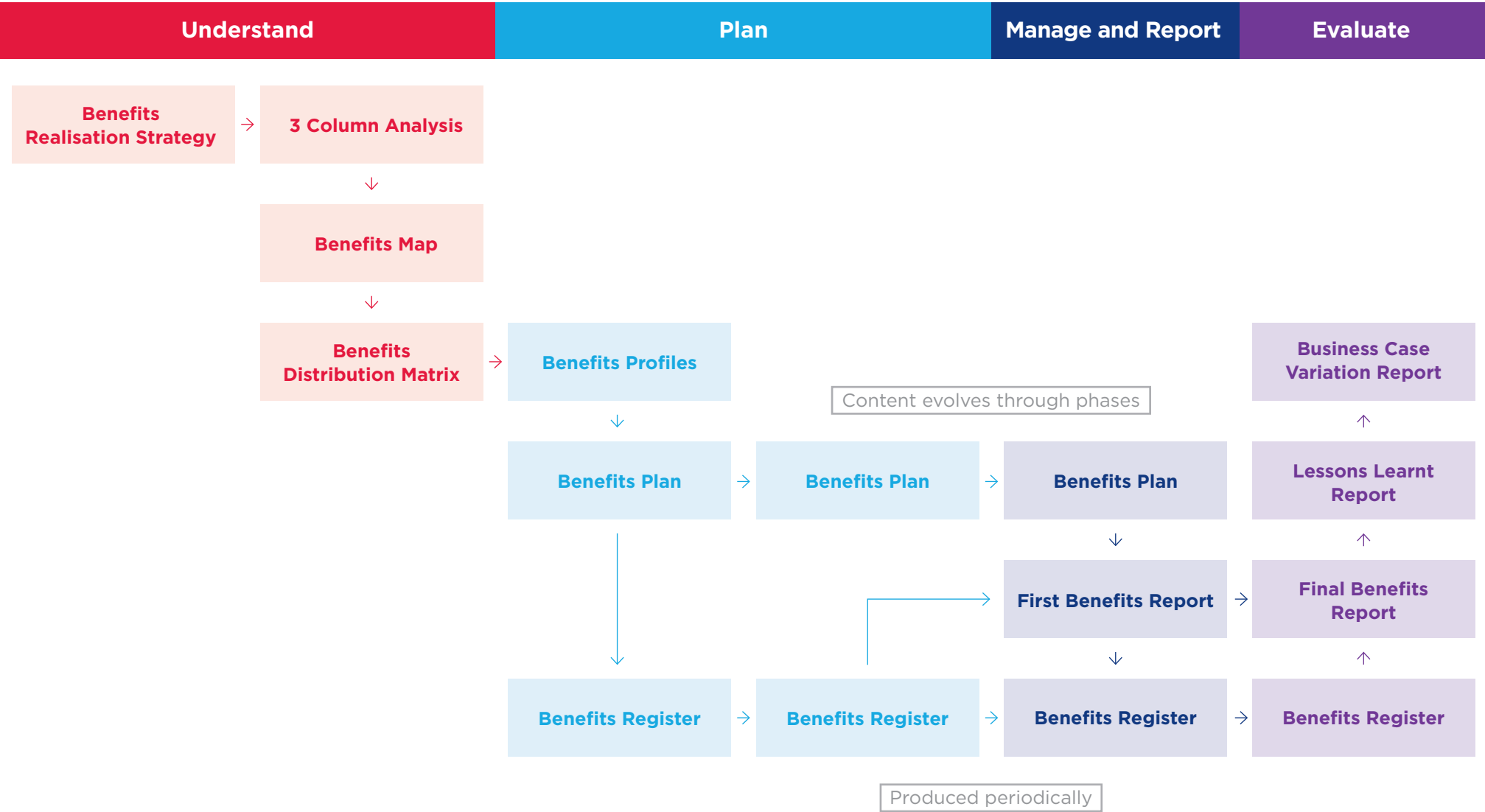


Figure 1 - Benefits Realisation Management deliverables



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# Benefits Realisation Management Framework

## Part 3: Guidelines

This document is part of the NSW Government Benefits Realisation Management Framework. The structure of the Framework is as follows:

## Part 1: Principles

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## Part 2: Process

---

## Part 3: Guidelines

---

## Part 4: Implementation

---

## Part 5: Glossary

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# Benefits Realisation Management Framework

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**A standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across NSW Government.**

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## **The purpose of the Benefits Realisation Management Framework is to provide:**

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## **The Framework:**

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- must be accessible by strategy groups, operational business areas and program/project teams as well as by individual practitioners and benefit owners
- should help PMO practitioners improve their decision making and become better at implementing beneficial change.

# 1. Introduction

## 1.1 Document Purpose

The purpose of Part 3 of the Guidelines is to provide an introduction to benefits management practice to assist program management practitioners to implement a benefits process.

The Guidelines provide a structured approach for agencies to manage and demonstrate the realisation of benefits from change programs. They help practitioners show the linkage between investment and government policy priorities, agency business objectives and service delivery outcomes.

Supporting these Guidelines are sample templates for benefits realisation:

- The Benefits Plan is used as a key component in the development of business cases used to support proposals for new change programs.
- The Benefits Register is used to ensure that potential benefits are captured and realised.
- For sample templates see Part 5: Glossary.

## 1.2 Scope

The Guidelines cover the phases involved in effectively understanding, planning, realising and reporting benefits of business change programs. It outlines how these phases relate to developing business cases as explained in the NSW Government Business Case Guidelines see Figure 3 (Benefits Realisation Management Deliverables) It does not cover areas such as writing a business case, undertaking project or program management, portfolio management or governance.

It should be read together with other NSW Government Guidelines including NSW Government Business Case Guidelines, Guide to Cost Benefit Analysis, Program Evaluation Guidelines, Digital Government Strategy and Digital Service Standard. Noting that currently there may be some differences in the use and meaning of terms.

---

**an introduction to  
benefits management  
practice to assist  
program management  
practitioners to  
implement a  
benefits process**

---

# 2. Objectives of Benefits Realisation Management

## 2.1 The Case for Benefits Realisation

Effective benefits realisation is critical to the achievement of the outcomes desired from investments. Benefits realisation is an important contributor of key information to the development of business cases, portfolio management, governance and decision making by Government.

## 2.2 Objectives of Benefits Realisation Management

The objectives of Benefits Realisation Management (BRM) are to:

- ensure benefits are identified and defined clearly at the outset, and linked to strategic outcomes
- ensure business areas are committed to realising their defined benefits with assigned ownership and responsibility for adding value through the realisation process
- drive the process of realising benefits, including benefit measurement, tracking and recording benefits as they are realised
- use the defined, intended benefits as a roadmap for the program, providing a focus for delivering change
- provide alignment and clear links between the program (its vision and desired benefits) and the strategic objectives of the agency involved.

For more information on the principles that underpin benefits realisation management, see Part 1: Principles.

## 2.3 What is a Benefit?

A benefit is the measurable improvement resulting from an outcome which is perceived as an advantage by a stakeholder.

Benefits are the specific outcomes where accountability can be assigned and measurement defined. Benefits are used for defining and declaring success of an investment. Benefits are the net positive changes resulting from outcomes. It is essential to understand the outcomes before we can define and declare them as benefits.

Benefits can be classified into the following types:

- Financial - benefits that can be quantified and valued in financial terms e.g. cost savings, revenue generation
- Non-financial - benefits that can be quantified in non-financial terms or qualitative terms e.g. user satisfaction, performance measures.

For a list of terms and definitions used in this document see Part 5: Glossary.

## 2.4 Challenges typically encountered in Benefits Realisation

The Guidelines aim to increase successful benefits realisation. They address typical challenges encountered in benefits realisation, including:

- ill-defined benefits
- unclear program objectives
- unclear strategic goals
- benefit measures data is unavailable or inaccurate
- unclear benefits ownership.

## 2. Objectives of Benefits Realisation Management (cont.)

### 2.5 Critical Success Factors

Benefits Realisation Management requires the following three strategic and integrated characteristics in place for successful operation.

Characteristics	Critical Success Factors
<b>Stakeholder Buy-In</b>	<ul style="list-style-type: none"><li>• Senior management leadership and commitment</li><li>• Active stakeholder participation</li><li>• Operational ownership of benefits</li></ul>
<b>Management of Information</b>	<ul style="list-style-type: none"><li>• BRM profiles, plans and tracking registers up to date</li><li>• Data is available from digital services by default</li><li>• Alignment with business forecasting/budgeting and actual performance</li><li>• Alignment with project/program management and evaluation systems</li></ul>
<b>Embedded BRM</b>	<ul style="list-style-type: none"><li>• Alignment of benefits to strategic objectives</li><li>• Governing bodies maintain a benefits management focus</li><li>• Monitoring and evaluation processes embedded into organisation</li><li>• Integration with program, change management and program evaluation</li></ul>

## 2. Objectives of Benefits Realisation Management (cont.)

### 2.6 Risks to Benefits Realisation Management

Risks may arise from poor forecasting or program delivery issues. Below are examples of risks to benefit realisation and what should be considered when preparing migration plans.

Risk	Response
<b>Benefits forecasts are incorrect or overestimated</b>	<ul style="list-style-type: none"><li>Identify the intended outcomes prior to the enablers/business changes required to realise the benefits</li></ul>
<b>Optimistic benefits estimates or target benefit measures are unrealistic</b>	<ul style="list-style-type: none"><li>Identify how the impact of the program will be measured</li><li>Identify data and systems to measure the program's impact and how to adopt, adapt or procure them</li><li>Determine the baseline measure prior to agreeing the target measure</li><li>Estimate the potential for un-planned reduction in the value of the benefit in the future</li></ul>
<b>Benefits delivery failure</b>	<ul style="list-style-type: none"><li>Failure to deliver the initiative with the planned functionality and on time, so impacting on the scale and timing of benefits realisation</li></ul>
<b>The focus on benefit realisation is not maintained throughout the full program lifecycle</b>	<ul style="list-style-type: none"><li>Establish tools and techniques to collect, manage and analyse data digitally</li><li>Implement a stage gate review process which includes benefit related deliverables and acceptance criteria for each stage gate</li><li>Produce periodic program status reports which focus on tracking 'actual' benefits against those identified in the original business case</li><li>Report on performance in a dashboard</li><li>Have a reference that benefits management should be a standing agenda item at each program board meeting</li><li>Have a defined governance structure in which benefits are managed</li></ul>
<b>The benefits realised cannot be tracked back to the original business case including the underlying cost benefit analysis</b>	<ul style="list-style-type: none"><li>Baseline the benefits at key milestones and ensure that any changes are subject to a formal change control process</li></ul>
<b>Benefit owners lose focus on benefit realisation</b>	<ul style="list-style-type: none"><li>Agree with benefits owners their accountabilities, meet regularly with benefit owners to review progress and reinforce commitment</li><li>Establish a performance management system which is clearly linked to realising benefits</li><li>Report on performance in a dashboard</li></ul>
<b>Staff do not have the capability or capacity to support new ways of working</b>	<ul style="list-style-type: none"><li>Update the organisation structure to reflect the new processes and systems</li><li>Encourage organisation to have capacity building initiatives</li></ul>

Active participation of stakeholders is of critical importance particularly in programs undergoing major change. It requires a certain level of discipline and attention to detail that is often overseen and undervalued. Through the implementation of clear governance, planning and the implementation of effective change management processes, the risk of program failure can be substantially reduced.

## 2. Objectives of Benefits Realisation Management (cont.)

### 2.7 Design Principles

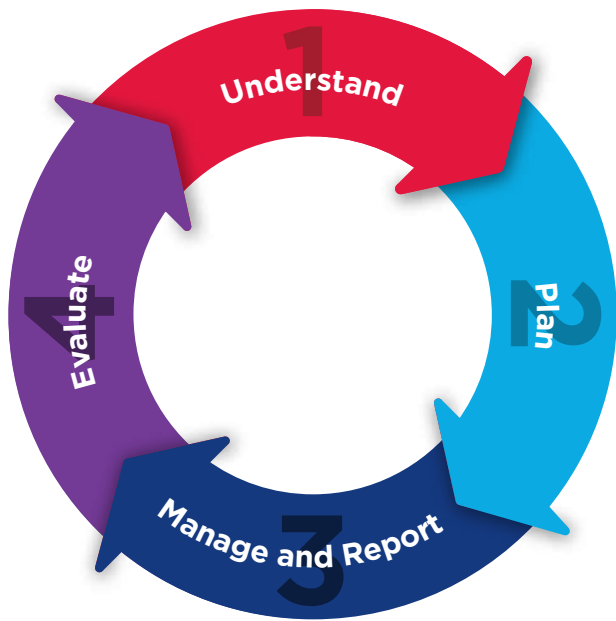
The following outlines the minimum requirements Agencies should adhere to in relation to the successful implementation of benefits realisation management. The following principles underpin best practice benefits management.

<b>Business Rule</b>	<b>Purpose</b>
<b>Assign single points of accountability for realisation of each intended benefit</b>	Benefit Owners must be identified and accept their role to lead the successful realisation of benefits
<b>Baseline measures should be taken for prioritised tangibles</b>	The baseline will provide an independent and credible reference level to demonstrate the extent of change
<b>Develop benefit profiles for prioritised benefits using profile template</b>	Developing profiles will ensure a complete assessment of prioritised benefits is undertaken
<b>Develop a benefits plan outlining how and when benefits will be monitored and realised</b>	A benefits plan will ensure that all the tasks and actions to realise benefits are recorded and monitored in a single document
<b>Establish a benefit tracking tool or benefits register</b>	The progressive achievement of benefits must be tracked throughout the program and beyond completion (note: in many cases benefits are realised after the program is complete)
<b>Establish digital data collection by default, if applicable</b>	Measuring the program service will be built into the service system design, if applicable
<b>Establish a change control procedure which includes an assessment of impact on benefits</b>	All changes should be fully assessed through the change control process to determine the impact on the expected benefits or benefit assumptions, prior to being approved by the relevant authority to ensure that benefits are not compromised
<b>Adequately resource a benefit management capability</b>	Departments should adequately resource benefits management to support program planning and evaluation
<b>Establish a governing body e.g. a steering committee monitoring benefit realisation</b>	A benefits governing body will ensure that the activities with a clear mandate for monitoring benefit realisation are progressed and that any major issues are identified and resolved in a timely manner
<b>Establish Benefit realisation reference groups</b>	The sharing of lessons learned and experiences will enable the benefits management capability across the sector to continually develop and improve

# 3. Benefits Realisation Management Process

## 3.1 Four Phases of Benefits Realisation

This section introduces the benefits realisation process, outlining the four key phases that can enable a program to realise benefits. Subsequent sections define each phase, each with its purpose and deliverables. The four key phases are displayed in a circle to reflect the iterative nature of the process.



### Phase 1: Understand

The understand phase is about understanding why the program is needed, and identifies the required outcomes to address a problem and achieve the program’s purpose. This phase establishes the program’s strategic intent and defines the vision, objectives, and potential benefits, ensuring alignment with strategic drivers.

### Phase 2: Plan

A plan is then created which builds upon the understand phase. The plan defines how the impact of the program will be measured, how data will be collected, benefit targets, benefit owners, and what activities need to be planned to realise the benefits. The deliverables of the plan will inform the benefits section of the program business case.

### Phase 3: Manage and report

Realising the benefits is then achieved by monitoring progress towards the planned outcomes. Any deviations from the plan can be assessed early with the appropriate corrective action taken. Throughout this process the business case should be updated and maintained as there may be differences between what was initially proposed and what is attainable as the program progresses. The manage and report phase will measure, analyse and understand the program outcomes to proactively support delivery of benefits.

### Phase 4: Evaluate

The evaluation phase documents the program outcomes and identifies learnings from program activities to inform strategic decisions and priorities. A governance body will determine the scope and focus of this evaluation phase or whether an independent Program Evaluation is required. For guidance on planning, managing and commissioning an independent Program Evaluation see the NSW Government Program Evaluation Guidelines.

## 3.2 Implementing the Framework

This framework and supporting processes and templates should be adapted to the specific environment an organisation operates in to optimise its use and increase its relevance to local stakeholders. For information on what to consider when adapting the deliverables and techniques see Part 4: Implementation.



# 4. Phase 1: Understand

Define vision, objectives and potential benefits ensuring alignment with strategic drivers.

## 4.1 Objective

The Understand phase identifies and defines the problem, that the program is seeking to address, and potential outcomes and benefits of the program. Appraising business ideas by focusing on the potential benefits, answering 'why we are doing this?'. This process of understanding the problem being addressed, outcomes and benefits is integral to writing a business case, with the articulation of the benefits providing the rationale and objectives of the program.

## 4.2 Questions

This phase aims to answer the following key questions:

- Has the program vision, objectives and desired outcomes been articulated?
- Who will be impacted by the program?
- Have the stakeholders been identified?
- What are the benefits of the program?

## 4.3 Process

To answer these questions, it is recommended that the following activities are undertaken:

- Articulate the vision/objectives/key principles, business context of the benefits:
  - explain why the program is needed, what problem is trying to be solved
  - define the scope and objectives of the program
  - define benefits intended to flow from the outcomes
- Identify stakeholders
- Collaborate with stakeholders to identify benefits:
  - facilitate reviews with stakeholders using a brainstorm technique such as the Three-Column Analysis

- Map the outcomes and benefits with stakeholders:
  - map and estimate scale of benefits
  - define the intermediate and final outcomes required to realise the benefits
  - analyse the impact of the change on different stakeholders
  - review how the impact of the program could be measured, considering the program maturity. For more information see Part 4: Implementation
  - identify any enablers
  - identify any dis-benefits
- Develop a benefits realisation strategy:
  - identify which benefits are considered strategic and align these with the strategic goals
  - identify any potential risks associated with either the forecasting or delivery of the benefits
  - review any interdependencies with other programs that may be claiming the same benefits
  - define the governance requirements to support benefits realisation
  - assess the resources required to identify and manage benefits
  - see Part 4: Implementation for information on adapting benefits deliverables to organisational needs
- Obtain sponsorship buy-in and ownership of benefits:
  - identify benefit owners
  - validate benefits realisation strategy with stakeholders

## 4. Understand Phase (cont.)

### 4.4 Deliverables

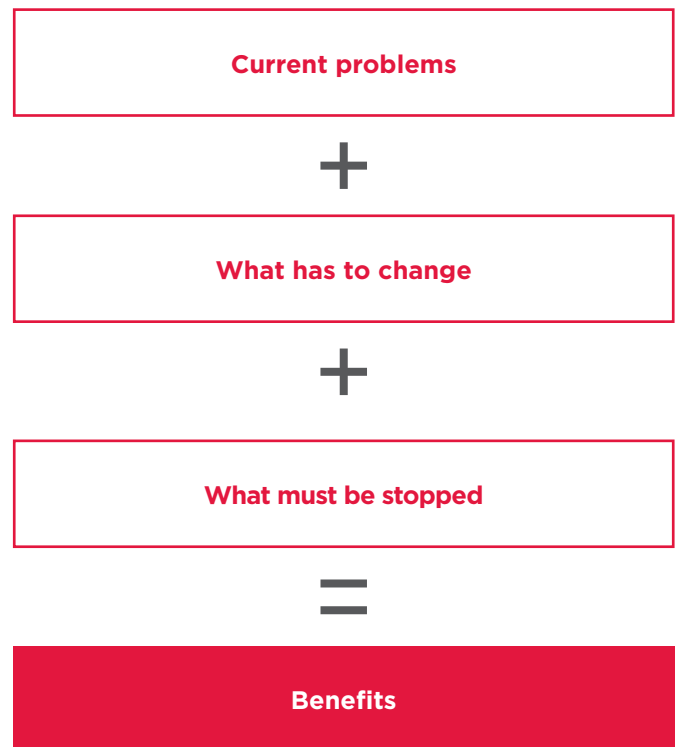
Characteristics	Required	Recommended
Benefits Realisation Strategy	✓	
3 Column Analysis	✓	
First draft Benefits Map	✓	
Benefits Distribution Matrix		✓

#### 4.4.1 Benefits Realisation Strategy

The benefits realisation strategy identifies, at a high level, how benefits are aligned to the organisation's strategy and the approach to ensuring that benefits are not double-counted. It describes the end goal and the required direction for the organisation. It generally includes a benefits map that provides a clear line of sight between outcomes, objectives, end benefits, intermediate benefits, business changes, enablers and dis-benefits. A benefits realisation strategy is a useful document for communicating expectations and assessing the impact of unexpected changes, both internal and external. A benefits realisation strategy template is available in Part 5: Glossary.

#### 4.4.2 Three-Column Analysis

A useful technique to help stakeholders understand and agree what is the current business problem, what has to change (and what must be stopped) and to start to identify benefits, is a three-column analysis. This technique involves brainstorming answers to each of the four sections shown below.



#### 4.4.3 Benefits Map

The benefits map is a diagram that shows the cause-and-effect mechanisms by displaying how the program inputs, activities and outputs will lead to certain outcomes for stakeholders. A visual map helps stakeholders to understand the program chronology and intended outcomes. Also, it helps to avoid double counting of benefits, ensuring benefits are attributed to the correct program input or output. Typically, a benefits map is developed by working from right to left to identify the benefits which will contribute to each objective. Although some stakeholders may prefer to work left to right. There are many benefits mapping techniques and online tools. For further information see Part 5: Glossary.

## 4. Understand Phase (cont.)

### 4.4.4 Benefits Distribution Matrix

The benefits distribution matrix identifies how the benefits and potentially dis-benefits are distributed between the stakeholders. There are several techniques for mapping the impact of change on stakeholders. The example below is based on the work of Gerald Bradley. The matrix can be used to identify the appropriate benefit owners or review the scope of the program to ensure the benefits are more evenly distributed. It can also identify stakeholders that may be disadvantaged (either real or perceived) and may support stakeholder engagement and communication. For further information see Part 5: Glossary.

## 4.5 Considerations and Techniques

### 4.5.1 Benefit Workshops

Workshops are a technique to engage a cross-section of stakeholders to help identify benefits by answering key questions. Their answers to the questions below will inform an understanding of the cause-and-effect mechanism(s) by which the program activities and outputs will create certain outcomes and benefits.

- why is the program needed?
- what are the strategic outcomes of the program?
- how will the stakeholder be impacted?
- what are the measurable benefits?
- who owns the benefits?
- what is the mechanism to realise the benefits?

	Expenditure Review Committee (ERC)	Steering Committee	Program Director	Benefit Owners	BR Coordinators
<b>Key benefits</b>					
Creating and maintaining optimum project portfolio		Benefit	Benefit		
Increase return on investment	Benefit	Benefit	Benefit		
<b>Key dis-benefits</b>					
Extra effort required by agencies				Dis-benefit	Dis-benefit

Figure 1 – An example of a Benefits Distribution Matrix

# 5. Phase 2: Plan

Prioritise the benefits and business change required to determine a plan for achieving the objectives.

## 5.1 Objective

The Plan phase develops the initial findings from the understand phase into a benefits plan. The plan phase defines how the impact of the program will be measured, how data will be collected, what the benefit targets are, who the benefit owners are, and what activities need to be planned to realise the benefits. The deliverables from this Plan phase will inform the benefits section of the business case.

## 5.2 Questions

This phase aims to answer the following questions:

- what type of benefits will the program realise?
- can benefits be measured? What are the measures and data source?
- who should be responsible for realising each benefit?
- have the baseline data and targets been agreed with benefit owners?
- are there any risks relating to either the forecasting of benefits or delivery failures?

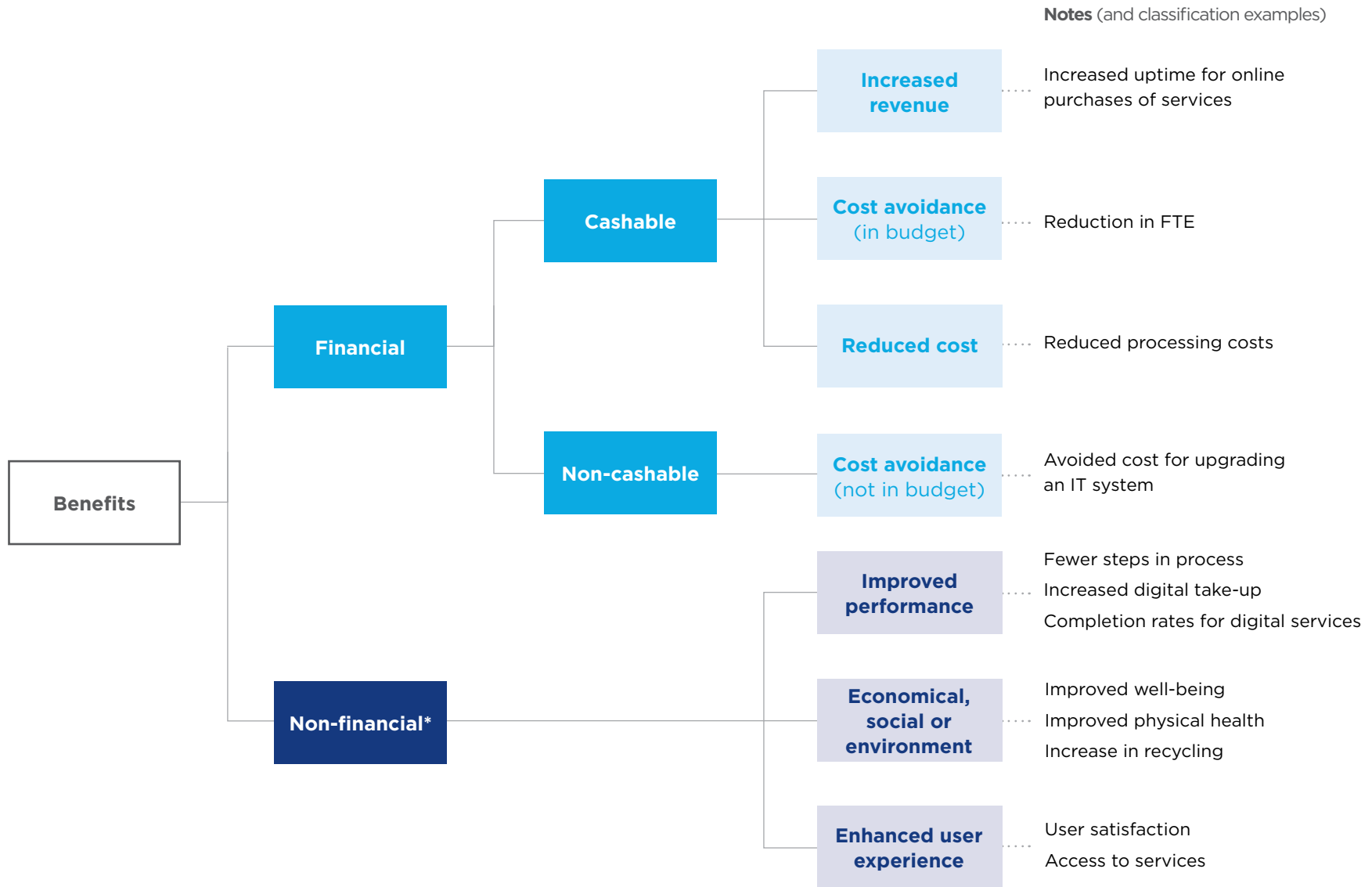
## 5.3 Process

To answer these questions, the following structured approach needs to be planned and undertaken:

- Classify benefits

There are several ways to categorise benefits. The structure in Figure 2 is based on the work of the NSW Government BRM Community of Practice. The initial groups are financial and non-financial categories. Classifying benefits informs which benefits should be valued financially or measured in relation to performance.

## 5. Phase: Plan (cont.)



\*These are examples and should be tailored to the program/project environment

## 5. Phase: Plan (cont.)

### Identify benefit measures

- agree with stakeholders which benefits should be measured, determine which benefits will best show the impact of the program
- determine which benefits can be measured and how, wherever practical, use existing performance measures, limit the number measuring unless program
- maturity is high. For more information on maturity see Part 4: Implementation
- consider how the available digital data could inform understanding on impact on stakeholders or user needs
- identify what is the key performance indicator (KPI) measure for each benefit
- determine whether data is available digitally, if not determine how data will be obtained
- for digital services, the Digital Service Standard identifies, all services must, at a minimum measure user satisfaction, digital take-up, completion rate and cost per transaction
- obtain a baseline measure for each benefit. Take a baseline measure at the earliest possible opportunity
- determine how much the benefit measure is expected to improve; establish a target
- determine the timeframe and milestones for each benefit.

### Value benefits

- prepare an economic appraisal of the benefits in accordance with the NSW Government Guide to Cost-Benefit Analysis
- consider how the digital data available could improve economic appraisal analysis or expand the types of analysis

### Create benefits register

- capture data into benefits tracking tool or benefits register, see Part 5: Glossary for templates. How to capture data will be influenced by the program maturity. See Part 4: Implementation for information on maturity

### Develop benefit profiles

- create a benefit profile showing the measure attributes of each benefit on one page
- validate with Benefit Owners to ensure: the benefits are realistic, target values are achievable, and that the stakeholders understand and agree

### Establish governance

- determine who will be responsible for benefits realisation, what governance structures, processes, resources and information needs are required, etc. For information on program governance structures refer to Prince2®.
- list any potential risks to benefits realisation and consider adding a confidence rating to each benefit

### Confirm benefit ownership

- review responsibilities with the assigned Owner and obtain their agreement/sign-off

### Develop benefits plan

- consolidate benefit measures, governance requirements into a benefits plan appending the benefits register and profile
- review benefits plan with stakeholders and obtain program sponsor/ benefit owner approval.

### Inform business case

- use the benefits plan to inform the requirements of the benefits section of a business case
- develop the business case in accordance with the NSW Treasury's NSW Government Business Case Guidelines
- confirm the strategic link between the benefits identified and NSW Government strategies

## 5.4 Deliverables

Deliverable	Required	Recommended
Benefits Plan	✓	
Benefits Profiles (profile included in Plan)	✓	
Benefits Register	✓	

## 5. Phase: Plan (cont.)

### Benefits Plan

The benefits plan explains how the program benefits will be realised. It outlines how the benefits will be monitored, managed, reported upon and evaluated, including any interdependencies with other change initiatives. It helps the program team to understand and keep track of what activities are required to enable benefit realisation. The benefit plan should clearly define the measurable benefits, and include baseline data and provide context on the need for the program and any subsequent program changes. This information will inform an evaluation on whether the program has delivered its expected benefits, providing a foundation and evidence for the evaluation phase and if required an independent program evaluation.

The benefits plan should evolve throughout the program life-cycle and can provide input into other program documents, as well as change management and program evaluation planning. It forms part of the Prince2 Project Initiation documentation. The benefits plan should be reviewed regularly and updated when benefits are achieved, or if any new benefits or dis-benefits emerge, or if there is a program change that will impact the realisation of any benefits. A benefits plan template is available in Part 5: Glossary.

### Benefits Register

A register which tracks, for each benefit progress towards realisation targets can be a benefit register such as the template in Part 5: Glossary or a benefit tracking tool incorporated into a digital service. A benefit register can be linked with the benefits estimated in the cost benefit analysis and can be appended to the Benefits Plan. The selection of benefit tracking tool will be dependent upon the maturity of the organisation and program. For more information see Part 4: Implementation. The benefits register or tracking tool should contain the following key information about each benefit including:

- benefit name
- benefit description
- measurement metric
- calculation methods
- data source
- current baseline measurement and target
- timeframe for realisation
- benefit ownership

### Benefit Profiles

The benefit profile is a view of a single benefit, showing all key attributes including measures, estimated value and dependencies. The data can be extracted from a benefit tracking tool or benefits register. A benefit profile supports good governance, as it enables the benefit owner and other stakeholders to quickly appraise all the attributes of a benefit. The benefit owner will be responsible for approving the target measures and the extent of improvement that is achievable. Benefit profiles can be appended to the Benefits Plan. A Benefits Profile template is available in Part 5: Glossary. It generally contains the following key information:

- unit of measure
- method of measurement
- benefit calculation methods (if appropriate)
- data source
- baseline measurement
- improvement timescale
- beneficiary of the expected improvement
- approved by benefit owners
- rationale

## 5.5. Considerations and Techniques

The following considerations and techniques are recommended for planning for benefits realisation:

- select measures that will indicate success of this program specifically. For example, overall user satisfaction will be influenced by many initiatives and can be too broad a measure. Selecting specific questions from user satisfaction survey results will be more relevant.
- be careful not to have too many measures
- always look for existing measures for benefits. A Cluster may have an existing dashboard and performance reporting that captures existing measures
- check benefits included in inter-dependent projects to avoid potential double counting of benefits
- meet with stakeholders to ascertain baseline metrics and level of buy in
- take the baseline measures at the earliest opportunity to ensure that any early achievement of benefits i.e. quick wins, are recognised and reported.

# 6. Phase 3: Manage and Report

Measure and analyse the program outcomes to proactively support the delivery of benefits.

## 6.1 Objective

The Manage and Report phase establishes the ongoing monitoring and reporting upon benefits beyond the life of the program into the business operations of the organisation.

Reporting should commence as soon as the program delivery commences. Initial reports should focus on progress in achieving intermediate outcomes of the program e.g. new capabilities successfully delivered, change outcomes achieved. This will give an early indication on the likelihood of program outcomes being achieved and inform if any corrective action is needed.

This phase continues over the life of the program and beyond completion of program delivery. Strategic benefits are usually realised well beyond the program delivery life-cycle. This phase does not end until the benefits have been realised, which may be several years, with the responsibility for ongoing management and reporting needing to be handed over to the usual business operations of the organisation.

A benefits register or benefits tracking tool needs to capture and monitor progress on benefits identified in the benefits plan and business case. These benefits deliverables will be reviewed in the Evaluate phase and if required an independent program evaluation.

## 6.2 Key Questions

This phase answers the following key questions:

- have any quick wins been realised?
- has progress been reviewed against the business case?
- has anything changed, such as program scope, organisational structure, external factors, that will impact the realisation of benefits?
- has an effective and sustainable monitoring, data analysis and reporting process been established? Or has data capture and analytics on benefits been embedded into the system with the capability to access, interpret, analyse and report upon and use data?
- do benefit reports/dashboards meet the needs of different stakeholders?
- are the responsibilities for ongoing managing and reporting documented in the benefits plan?

## 6.3 Process

To effectively manage and report on the realisation of the benefits, the following tasks are undertaken during this phase:

### Operationalise the benefits register or benefits tracking tool

- review all the benefits selected for measurement during the Plan phase
- agree with stakeholders when and at what frequency benefits should be measured in the benefits tracking tool or benefits register
- agree with stakeholders the governance required for reviewing and approving changes.

### Agree final targets with benefits owners

- schedule benefits review sessions with benefits owners
- ensure all benefits owners have signed off their allocated benefits.

### Monitor program progress

- identify any quick wins
- assess how program progress and any external factors are impacting the intended outcomes
- identify changes or issues that may affect the realisation of benefits, either positively or negatively
- capture emerging benefits of the program, justify why they are included.

### Review progress against business case/baseline

- validate that the benefits are still valid and achievable
- assess if there are benefits that need to be deleted.

### Update the benefits plan and benefits register/benefits tracking tool

- obtain and record the actual measurements for the benefits in the benefits register or confirm that a benefits tracking tool is capturing the required data

### Establish reporting on progress

- agree with stakeholders the content, format and required frequency of reporting.

### Handover reporting to BAU team

- obtain agreement on ongoing BAU responsibilities.



## 6. Phase: Manage and Report (cont.)

### 6.4 Deliverables

Deliverable	Required	Recommended
Benefits Plan	✓	
Benefits Profiles (profile included in Plan)		✓
Updated Benefits Register	✓	

### 6.5 Benefits Report

A report can be as simple as a benefit register such as the example below through to a benefit tracking tool that is integrated into a system with customisable visualisation tools and public dashboards. Benefit reports will be dependent upon and will evolve in response to digital capability, audience needs and any evaluation requirements. It is important that the report presentation is structured to enable stakeholders to:

- make data driven decisions about how to improve services
- make comparisons with other government services
- provide transparency on service performance.

For recommendations on assessing digital capability and process maturity see Part 4: Implementation and Australian Government Digital Service Standard. When possible, it is recommended that explanations are expected impacts of change requests, any forecasting or delivery risks, corrective actions or lessons learned are included in reports.

### 6.6 Considerations and Techniques

The following techniques and considerations are recommended for establishing effective management and reporting:

- ensure all measurement and review activities are undertaken on a formalised basis, with regular formal meetings established
- embed benefits into existing reporting and include any expected savings into forward year budgets.
- face-to-face conversations are important to effectively understand the benefit realisation progress and to gain a shared understanding of the current situation and actions required
- capture any anecdotal 'benefits' that arise from stakeholder discussions. Anecdotal items tend to be personal experiences of users, and therefore add considerable credibility to the success of a program. Consider formalising anecdotal benefits in the benefits processes (where practicable).
- recognise that benefits are dynamic and can change during the lifecycle of a program
- be alert for benefits that need to be deleted if they are no longer relevant or achievable
- consider the impact on the business case and update if required
- incorporate any new emerging benefits, consider the impact on the business case and update if required
- incorporate any monitoring that will support program evaluation requirements, where practical.

# 7. Phase 4: Evaluate

Identify learnings from program activities to inform strategic decisions and priorities.

## 7.1 Objective

The final phase in benefits realisation is to evaluate whether the program achieved its intended outcomes. The scope of this evaluate phase will be informed by several factors including benefit owners and other stakeholder's needs, program size and complexity.

In this phase, at a minimum, the business case, benefits report and benefits plan, including the benefits register, benefits map, governance and risks, will be reviewed. The benefits register will be reviewed to compare the data collected on actual performance with the baseline data and forecast targets. The benefits map and benefit distribution matrix will be reviewed to assess how the program activities planned contribute to the intended outcomes, in comparison with actual outcomes, who benefited from the program, how and to what extent, and whether there were any unintended consequences for stakeholders. Periodic benefit reports will be reviewed to identify and provide context for approved changes to the program or benefit forecasts.

The findings from this evaluate phase will inform decision making on whether a more in-depth review is required, or if program improvements or corrective actions are required. These findings could be documented in a business case variation report or lessons learned report.

Also, the finding will provide evidence for an independent program evaluation, if required. See the NSW Program Evaluation Guidelines for guidance on approaches to program evaluation including planning and management recommendations.

## 7.2 Key Questions

This phase answers the following key questions:

- were the intended program outcomes realised?
- do the benefit management deliverables provide sufficient evidence to evaluate the program?
- has the transition to BAU been managed?
- did the stakeholders realise the benefits they expected?
- has progress towards the vision/end state been reported against?
- have lessons learned been captured and communicated?

## 7.3 Process

It is recommended that following tasks be undertaken during this phase:

### Clarify the purpose and scope of the evaluation phase with stakeholders

#### Review the benefits deliverables

- review the data collected in the benefits register against baseline data and forecast targets
- review benefits map, benefits distribution matrix, benefits reports
- identify any gaps, any missing data or variations from targets
- review periodic benefit reports to check any approved changes and their explanation
- seek explanation for any unexplained variations from targets.

### Capture lessons learned to inform continuous improvement

- assess whether any variations were due to estimating errors such as over optimistic forecasts, delivery failures or scope changes to the program
- identify which stakeholders were impacted, how and to what extent
- identify any unintended outcomes or dis-benefits
- identify any external factors that may have impacted benefits realisation
- review and collect suggested corrective actions with program manager and benefits owners
- compile and document lessons and actions to be taken

### Report the results

- document findings and supporting evidence, the report type could be a business case variation report or lessons learned report
- escalate significant variations and collaborate with stakeholders to identify any corrective actions
- obtain approval for corrective action
- report regularly to stakeholders

### Update benefit deliverables when corrective actions are implemented

- throughout the process, review the benefits plan, benefits register and business case and update if required.

## 6. Phase: Evaluate (cont.)

### 7.4 Deliverables

Deliverable	Required	Recommended
Updated Benefits Register	✓	
Updated Benefits Report	✓	
Business case variation Report		✓
Lessons Learned Report		✓

#### Business Case Variation Report

The business case variation report compares the forecasted benefits in the business case, including the desired outcomes, target measures and calculation methods, with the findings of the evaluation phase. A business case variation report will document the differences, referencing any supporting information from benefit reports or governance meetings that may explain the variations.

#### Lessons Learned Report

The lessons learned report identifies any successes, challenges or lessons learned that occur throughout the benefits management process. The report will draw upon benefits management deliverables and relevant governance information to understand the root causes of any problems that occurred, in a bid to inform decision making on how to improve planning for future programs.

### 7.5 Considerations and Techniques

#### 7.5.1 Program considerations

Significant corrective actions may involve substantial changes in the program scope and budget. Formal approval is required for any changes to program scope and budget by the governance body and program sponsor.

#### 7.5.2 Reporting Implications for Whole-of-Government Programs

These Guidelines are intended to apply equally to agency, cluster and/or Whole-of-Government programs. Whole-of-Government programs include:

- large ICT enabled business change programs
- reform programs

Whole-of-Government programs need to understand, plan, realise and report benefits at agency and aggregated whole-of-government levels.

# 8. Benefits Realisation Deliverables

## 8.1 Overview of Key Deliverables

The following table shows how the phases and associated deliverables for the benefits realisation process align with program lifecycle deliverables.

Document	Understand	Plan	Manage and Report	Evaluate
<b>Benefits Realisation</b>				
Benefit Realisation Strategy	P			
3 Column analysis	P			
Benefits Maps	P	U	U	U
Benefits Register		P	U	U
Benefits Distribution Matrix	P	U	U	
Benefits Profiles		P	U	U
Benefits Plan		P	U	U
Benefits Reports			P	U
<b>Stakeholder Management</b>				
Stakeholder Management Strategy	P			
Stakeholder Management Plan		P	U	U
Change Plan		P	U	U
<b>Governance</b>				
Program Mandate	P			
Strategic Business Case		P		
Detailed Business Case		P		
<b>Program Management</b>				
Program Brief	P			
Program Initiation Document		P	U	U
<b>Program Evaluation</b>				
Business Case Variation report				P
Lessons Learned				P

P = Produced U = Updated

## 8.2 Overview of Process flow

The following diagram provides an overview of the benefits process flow and deliverables to understand, plan, manage and report and evaluate the realisation of benefits. It also indicates how the phases relate to developing a business cases as outlined in the NSW Government Business Case Guidelines.

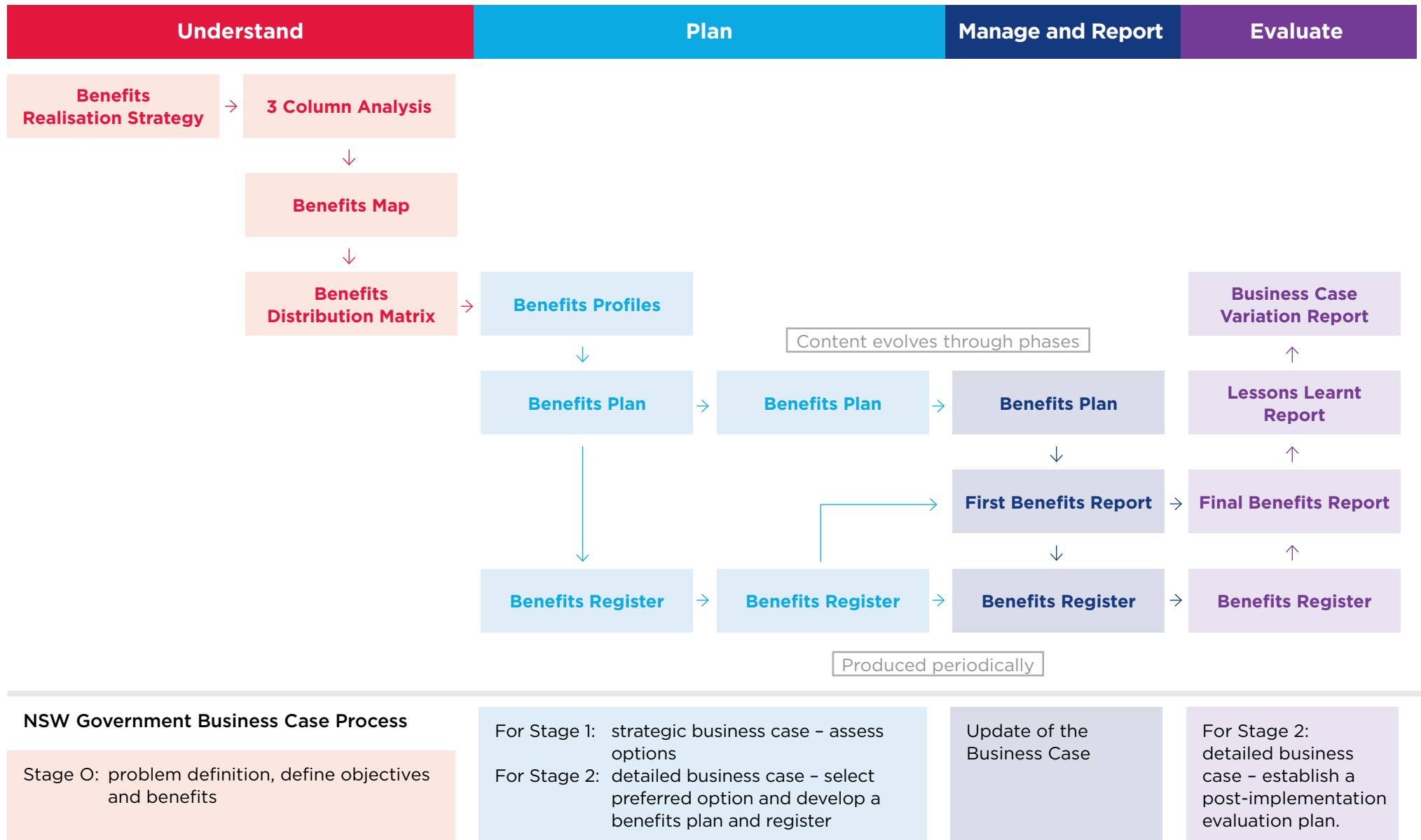


Figure 3 - Benefits Realisation Management deliverables

# 9. Benefits Realisation Governance

## 9.1 Governance Principles

Benefits Realisation Governance supports the four phases of Benefit Realisation Management. The following benefits governance principles should be considered:

- commitment and support at the senior leadership and executive level. Active support for the program will support and reinforce benefit ownership and realisation;
- clear and active program sponsorship and accountability. Sponsorship of the program, together with accountability for the benefits realised reinforces the benefits realisation process and framework; and
- program management and responsibility for defining, measuring and reporting benefits.

Clear responsibility and accountability of the roles to deliver the four phases of the benefits realisation guideline are critical.

## 9.2 Roles and Responsibilities in Benefits Realisation

A 'RACI' (Responsible, Accountable, Consulted, Informed) table is used to define the roles involved and their level of accountability or participation in an activity. The table below is a guide to defining the activities across the understanding, plan, manage and report and evaluate phases, the relevant roles and whether they are:

- **Responsible:** this role is responsible for achieving the result of the activity;
- **Accountable:** this role will be held accountable for the result of the activity;
- **Consulted:** this role will be consulted in order to agree on the result for that activity; or
- **Informed:** this role will be informed of progress and/or the outcome of the activity.

## 9. Benefits Realisation Governance (cont.)

**R** = Responsible    **A** = Accountable    **C** = Consulted    **I** = Informed

	High level activity/Step	Program Sponsor	Program Manager	Benefits Owner	Benefits Realisation Manager	Program Management Office
<b>Understand</b>	Obtain business context of benefits	<b>A</b>	<b>R</b>	<b>R</b>	<b>C</b>	<b>I</b>
	Develop a benefits realisation strategy	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>I</b>
	Identify stakeholders	<b>A</b>	<b>R</b>	<b>R</b>	<b>C</b>	<b>I</b>
	Identify and agree the outcomes/benefits with stakeholders	<b>A</b>	<b>R</b>	<b>C</b>	<b>I</b>	<b>I</b>
	Organise benefits discovery workshops with stakeholders	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>C</b>
	Identify benefit owners	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>C</b>
<b>Plan</b>	Establish benefits governance	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>C</b>
	Develop a detailed benefits plan	<b>I</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>A</b>
	Confirm benefit ownership	<b>A</b>	<b>R</b>	<b>C</b>	<b>R</b>	<b>I</b>
	Develop benefit profiles	<b>A</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>C</b>
	Establish the benefits register	<b>A</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>C</b>
	Prioritise benefits to enable focus on the delivery of high end benefits	<b>C</b>	<b>C</b>	<b>I</b>	<b>R</b>	<b>A</b>
	Inform the business case	<b>C</b>	<b>C</b>	<b>I</b>	<b>R</b>	<b>A</b>
<b>Manage and Report</b>	Update the benefits register	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>C</b>
	Agree final targets with benefit owners	<b>A</b>	<b>R</b>	<b>C</b>	<b>R</b>	<b>I</b>
	Update the benefits deliverables	<b>I</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>A</b>
	Review progress against business case/ benefits realisation register	<b>A</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>C</b>
	Establish a benefits tracking regime and mechanisms outlined in the benefits plan	<b>A</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>C</b>
	Handover benefits reporting and measurements to BAU team	<b>A</b>	<b>C</b>	<b>R</b>	<b>C</b>	<b>I</b>
<b>Evaluate</b>	Analyse the benefits	<b>A</b>	<b>C</b>	<b>R</b>	<b>R</b>	<b>I</b>
	Hold benefits evaluation meetings with all key stakeholders	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>C</b>
	Conduct post implementation review to inform corrective action	<b>A</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>C</b>
	Capture lessons Learned to inform continuous improvement	<b>A</b>	<b>C</b>	<b>C</b>	<b>R</b>	<b>I</b>
	Report the results	<b>I</b>	<b>I</b>	<b>I</b>	<b>R</b>	<b>A</b>

## 9. Benefits Realisation Governance (cont.)

### 9.3 Key Roles

To enable agencies to adapt the roles and responsibilities to their needs the following table shows the benefit management responsibilities of key roles

Position	Responsibilities
<b>Benefits Realisation Manager</b>	<ul style="list-style-type: none"> <li>• Owns the Benefits Realisation Management (BRM) Guidelines and toolkit including a benefits plan</li> <li>• Supports stakeholders with the adaptation and implementation of the benefits realisation toolkit to align with the program and /or wider environment</li> <li>• Provides objective challenge of benefits, dependencies, measures, targets and the program's approach to benefits realisation</li> <li>• Ensures department benefits plans align with the business case(s)</li> <li>• Produces the benefits register and/or sector-wide benefits register</li> <li>• Escalates any issues relating to BRM to the relevant governing body</li> </ul>
<b>Program Sponsor – Cluster (Deputy) Secretary</b>	<ul style="list-style-type: none"> <li>• Owns the departments business case(s)</li> <li>• Owns the Benefits Plan and is responsible for its adjustment, improvement and enforcement</li> <li>• Leads benefit reviews involving relevant stakeholders, business managers, and possibly internal audit</li> <li>• Approves, along with the Sponsoring Group, all benefits claimed by the program and described in the benefit profiles</li> <li>• Assigns responsibility for achieving the planned program benefits</li> <li>• Ensures links are maintained with other programs to maximise benefits</li> </ul>
<b>Benefit Owners</b>	<ul style="list-style-type: none"> <li>• Accept responsibility for realising assigned benefits</li> <li>• Identify and map benefits with the Benefits Realisation Manager</li> <li>• Identifies how the benefits are distributed between the stakeholders</li> <li>• Identify suitable benefit measures and targets with the Benefits Realisation Manager</li> <li>• Approve the Benefit Profile(s)</li> <li>• Measure and monitor the progress of realising the benefit ensuring the Department Benefit Tracking Register is kept up to date</li> <li>• Encourage workplace behaviour to support benefit realisation and the identification of additional benefits</li> <li>• Ensure the financial budget planning includes the intended outcomes of the realisation of each benefit</li> </ul>
<b>Program Manager</b>	<ul style="list-style-type: none"> <li>• Deliver the initiatives which enable the realisation of the Benefit Realisation</li> <li>• Plan on behalf of the Program Sponsor with the relevant stakeholders</li> <li>• Ensure any follow-up or corrective actions are taken to maximise benefits opportunities</li> </ul>



## 9. Benefits Realisation Governance (cont.)

The following table outlines the levels of governance in relation to Benefits Realisation Management:

Body	Scope	BRM Role
<b>Expenditure Review Committee (ERC)</b>	All sector-wide reform	<ul style="list-style-type: none"> <li>Oversee the distribution of reform investment across the Departments, in order to create and maintain a strategically balanced high-value portfolio</li> <li>Conduct regular strategic reviews of the sector-wide reforms to ensure that the investment is focused on delivering desired benefits</li> </ul>
<b>Agency Program Board (Sponsoring Group)</b>	Department Program level	<ul style="list-style-type: none"> <li>Oversee the distribution of investment across the level Department, in order to create and maintain a strategically balanced high-value portfolio</li> <li>Show visible commitment to the Blueprint and to the realisation of the end Benefits</li> <li>Approve the Benefit Plan</li> <li>Link the Program Sponsor's performance agreement to the successful delivery of the program's benefits</li> <li>Receive periodic reports to monitor the status of benefit realisation across the Department</li> </ul>
<b>Program/Project Control Groups</b>	Single program or project	<ul style="list-style-type: none"> <li>Approve relevant Stage Gate submissions specific to an agency and all relevant Gateway Reviews and Health Checks aligned with relevant assurance requirements, including the following NSW Government ICT Assurance Framework, Recurrent Investor Assurance Framework and the Infrastructure Investor Assurance Framework</li> <li>Receive periodic reports to monitor the status of benefit realisation within the program</li> </ul>

## 9. Benefits Realisation Governance (cont.)

### 9.4 Reporting

Benefit tracking and reporting has the dual purpose of monitoring and improving performance through the implementation of continuous improvement initiatives.

For Agency Program Boards, it is recommended that visual reporting is provided in the form of one page dashboards to focus attention to the areas which require direction or intervention.

For Program/Project Control Groups, it is recommended that reporting by exception is used which presents detailed information on the areas where there is a deviation from expectation, e.g. measures which have fallen outside a specified tolerance of the relevant target, requiring further action.

Both types of reporting will benefit from the use of 'BRAG' status colour coding as outlined below:

#### Blue

Target has been achieved and monitoring of this measure is now complete

#### Green

Measure is within a narrow tolerance of target

#### Amber

Measure is within a wider deviation from target

#### Red

Measure is outside acceptable deviation levels

### 9.5 Benefits Realisation Management Organisation Maturity

The Executive Program Management Office (EPMO) or relevant area of responsibility for benefits realisation management should undertake a regular assessment of their Agency's benefits realisation management maturity level and implement actions to improve. For best practice in maturity assessment see Part 4: Implementation.

### 9.6 Change Control

An assessment of how a change will impact intended benefits will form part of each change request assessment. A change request will be raised whenever there is a change that has the potential to materially affect benefits realisation. If there is a material change, the benefits profile, plan and register will be amended and they should subsequently be approved by the appropriate authority. Implementing this type of change control process will support benefits management becoming part of BAU in an organisation.

# 10. Considerations for managing risks to Benefits Realisation

The purpose of this section is to reference considerations that should be taken into account when identifying and managing risks to realisation of program benefits. The following considerations should be taken into account:

- start to think about any potential risks or barriers to the achievement of the benefits in the initial Understand phase
- when documenting risks consider whether it is practical to use a program log with a delineation between the risks to the benefits and project delivery. Or whether to capture risks in the benefits register or benefit tracking tool with a cross reference to the program or program risk log
- when documenting risk parameters be consistent with the organisation's risk management process as it will be easier for the program team and business to understand the likelihood and possible impact
- when developing a risk mitigation or response plan define the responsibility for risk treatment, mitigation or counter measure for both the program and business team members
- interdependencies with other programs should be captured so that any risk mitigation can be managed holistically and remove the possibility of programs double counting of benefits.

(See also 2.6: Risks to benefits realisation management)



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# Benefits Realisation Management Framework

## Part 4: Implementation

This document is part of the NSW Government Benefits Realisation Management Framework. The structure of the Framework is as follows:

## Part 1: Principles

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## Part 2: Process

---

## Part 3: Guidelines

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## Part 4: Implementation

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## Part 5: Glossary



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# Benefits Realisation Management Framework

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**A standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across NSW Government.**

---

## **The purpose of the Benefits Realisation Management Framework is to provide:**

- a framework of best practice principles and concepts drawn from latest experiences and proven practice in setting up and managing programs that is transferable across NSW Government agencies
- a standard approach for benefits realisation management for anyone not familiar with the subject matter
- consistent terminology and benefits categorisation
- introduction and guidance for program sponsors and business benefit owners.

## **The Framework:**

- is aimed at those who are interested in benefits realisation within NSW Government agencies, enabling them to adapt and tailor the guidance to their specific needs
- must be accessible by strategy groups, operational business areas and program/ project teams as well as by individual practitioners and benefit owners
- should help PMO practitioners improve their decision making and become better at implementing beneficial change.



# 1. Purpose

This framework provides guidance on best practice processes and deliverables, stakeholders are encouraged to adapt the framework to meet their needs and workplace. This part provides information on how to adapt the deliverables and techniques explained in Part 2, Part 3 and templates provided in Part 5 to meet stakeholder needs. Advising on what should be considered before starting, what analysis will help implementation plans and recommendations for adapting benefits management deliverables. The intent is to provide practical information to:

- help make the benefits analysis in the business case more robust
- make the process and deliverables more relevant to stakeholders
- help embed the benefits management planning and sustain progress towards realisation
- provide information and data to support an evaluation of the program, either as part of the evaluation phase or as an independent program evaluation.

# 2. Considerations

## 2.1 Questions

Benefits management informs investment decisions and establishes plans to realise intended benefits. Before starting to plan, clearly articulate why investment in the program is needed, asking evaluative questions such as

- What is the problem being addressed by this program?
- What are the strategic outcomes of the program?
- What are the measurable benefits?
- When will we realise the benefits?
- Who owns the benefits?

The answers to such questions can be documented in the benefits realisation management strategy with the supporting plans documented in the benefits plan. For more evaluative questions review the NSW Government Program Evaluation Guidelines, and think about what questions an evaluator would ask about the program.

## 2.2 Critical success factors

Before starting, consider the critical success factors that need to be in place for benefits management to be effective (refer to Figure 1). For more information, see Part 3: Guidelines on the challenges typically encountered in benefits management practice and the risks that may arise from poor forecasting or program delivery issues.

## 2.3 Principles

Before starting to adapt the benefits deliverables, review the benefits management principles in Part 1: Principles. The principles provide a foundation and rationale for how to approach and manage benefits, explaining the implications of each principle for a stakeholder organisation. The principles provide more context on why the benefits management process is needed and why specific deliverables are recommended.

## 2.4 Planning

How benefits management deliverables should be adapted and the timeframe will be influenced by the organisation's:

- maturity of the benefit management practice
- digital capability and software available
- governance requirements, including management and reporting information needs
- size, complexity, priority and risk of the program
- resources, both program and ongoing resources
- senior management sponsorship.

Characteristics	Critical Success Factors
<b>Stakeholder buy-in</b>	<ul style="list-style-type: none"><li>• Senior management leadership and commitment</li><li>• Active stakeholder participation</li><li>• Operational ownership of benefits</li></ul>
<b>Management of information</b>	<ul style="list-style-type: none"><li>• BRM profiles, plans and tracking registers up-to-date</li><li>• Data is available from digital services by default</li><li>• Alignment with business forecasting/budgeting and actual performance</li><li>• Alignment with project/program management and evaluation systems</li></ul>
<b>Embedded BRM</b>	<ul style="list-style-type: none"><li>• Alignment of benefits to strategic objectives</li><li>• Governing bodies maintain a benefits management focus</li><li>• Monitoring and evaluation processes embedded into organisation</li><li>• Integration with program, change management and program evaluation</li></ul>

Figure 1 - Critical Success Factors

# 3. Benefits Management Maturity

## 3.1 Assessing benefits management practice

Benefits management helps stakeholder organisations to define and manage the value they anticipate gaining from an investment. Benefits management maturity is the capability of the organisation to:

- identify and define potential outcomes and strategically aligned objectives and benefits
- develop a benefits plan, including classifying, valuing benefits data collection, target setting, establishing governance and benefit owners
- set up ongoing monitoring and reporting that meet stakeholders' needs
- evaluate whether the program achieved its intended outcomes.
- assess the capability to manage benefits before starting to implement. Such an assessment will inform:
  - how to collaborate with stakeholders and whether any capacity building is required
  - how to capture data and available metrics
  - whether weaknesses in benefits management can be remedied by activities in a benefits plan or whether capability needs to build up as part of a long-term improvement plan
  - potential risks to the program or benefit realisation and provide an early chance to address any weaknesses or mitigate any risks before they happen.

An initial assessment can be followed up with regular assessments to help sustain progress, by monitoring plans to address any identified weaknesses. Also, the assessment findings and progress against plans will provide useful information and data for the evaluation phase or if required, an independent program evaluation.

## 3.2 Assessment models

There are several ways to assess benefit management capability. The method selected will be influenced by the scope of the assessment and senior management commitment to funding an assessment. So hence there are a range of assessment tools referenced below including:

- P3M3® Portfolio, Program, Project Management Maturity Model
- Managing Benefits Health-check Assessment
- Digital Service Standard (Australian)
- NSW Digital Strategy – Digital standard

### **P3M3® Portfolio, Program, Project Management Maturity Model**

The P3M3® Maturity Model provides a publicly available set of independent benchmarks against which a portfolio, program or project can be assessed. The P3M3® focuses on seven perspectives that exist across the three areas and assessed at five maturity levels. The perspectives group together one or more processes, they include:

1. Organisational governance
2. Management control
3. Benefits management
4. Risk management
5. Stakeholder management
6. Finance management
7. Resource management

When planning a P3M3® assessment, an organisation may choose to review only one perspective (for example benefits management) or group together one or more processes of the seven perspectives to gain a better understanding of their overall effectiveness. For benefits management, the attributes of the five maturity levels are reproduced in the table below.

For an initial assessment of benefits management maturity, compare how the attributes defined at each of the five P3M3® maturity levels match with the capability of the program, or if applicable portfolio/organisation or project. This will indicate the current maturity level for benefits management.

### 3. Benefits Management Maturity (cont.)

#### Benefits Management Maturity Assessment Model P3M3™\*

Maturity	Portfolio	Program	Project
<b>Level 1: Awareness of process</b>	There is a recognition that initiatives may exist within the organisational and divisional portfolio to enable the achievement of benefits for the organisation	Where benefits management approaches exist, they have been developed in isolation by individual programs	Where benefits management approaches exist, they have been developed in isolation by individual projects
<b>Level 2: Repeatable process</b>	The development of the investment cycle is increasing the awareness and importance of identifying benefits and subsequently tracking their achievement	Benefits management is recognised as a key component for program success, with localised approaches in place	Benefits management is recognised as a key component for project success, with localised approaches in place for groups of projects
<b>Level 3: Defined process</b>	There is a centrally managed framework used for defining and tracking the delivery of portfolio-level benefits across the business operations	Program consistently deploy benefits management to define and track their realisation from the delivery of operational capability to align with a centrally defined approach	Projects consistently establish benefits management to define and track their realisation from the delivery of operational capability to a centrally defined approach
<b>Level 4: Managed process</b>	The benefits realisation management process is well established, measurable and is integrated into how the organisation managed itself	The program's benefits management approach is integrated with the organisation's performance management and uses the measurement and analysis of performance to verify and refine the program's effectiveness across the organisation	The project's benefits management approach is integrated with the organisation's performance management and uses measurement and analysis of performance to verify and refine project effectiveness across the organisation
<b>Level 5: Optimised process</b>	Benefits realisation is maximised to provide the greatest return (in terms of strategic contribution and efficiency) from the investment made	The program's benefits management is embedded within the organisational change and performance management approach, focusing on outcomes to achieve the strategic aims and objectives of the organisation, with continual improvement across the organisation	The project's benefits management is embedded within the organisational change and performance management approach, focusing on outcomes to achieve the strategic aims and objectives of the organisation, with continual improvement across the organisation

If the initial assessment indicates a low level of maturity, see the recommendations section for actions that could improve benefits management practice at program and project level.

### 3. Benefits Management Maturity (cont.)

#### Managing Benefits Health-check Assessment

An alternative approach is the Managing Benefits Health-check Assessment which uses a survey to evaluate stakeholder perceptions of benefits management practices within their organisation. The example survey provided in Managing Benefits Health-check Assessment asks stakeholders to score 10 statements on benefits management. The survey can be easily adapted for different organisations, is scalable and can be repeated to monitor progress over time. Stakeholders can easily quantify their own scores.

The survey findings can review different stakeholder groups or focus on specific areas, enabling stakeholders to consider what actions are required to address any problem areas. The survey findings could also inform how stakeholders are to be engaged. For low scores see the recommendations below for actions that could improve benefits management practice at program and project level.

#### Digital Service Standard

As an organisation's digital capability directs new investment in services as well as benefits management practice, it is recommended that the digital capability of an organisation be assessed. The Digital Service Standard provides guidance and assessment services for Commonwealth (Federal) government agencies making new investments in information and transactional services. The guiding principles that inform digital service design should be reviewed to provide more context on how to design the service. When measuring benefits on digital services, the Digital Service Standard listed four Key Performance Indicators that should be used - refer to Part 3: Guidelines.

All services within the scope of the Digital Service Standard can be assessed against the standard. Assessors help services to meet the Standard and provide assurance that the criteria has been met. The Digital Service Standard has been adapted from the UK Government's Digital by Default Service Standard under the Open Government Licence v3.0.

#### NSW Digital Strategy

Within NSW, digital service design and investment should be aligned with the priorities of the NSW Government Digital Strategy. The strategy sets out the following three priorities for how to approach the design and delivery of next-level, user-centric public policy and services, with underpinning digital standards:

1. Customer experience, recognising the user is at the centre of business and designing solutions that put the user first, with services that are digital by default, integrated, seamless and accessible
2. Data, designing policies, services and all strategic decisions around data insights, where possible. With robust data management, digital and accessible datasets and sharing government held datasets for collaborative use
3. Digital on the inside including:
  - simplifying and streamlining government business processes
  - eliminating duplication
  - shifting away from manual, paper-based activities to automated, digitally enabled ways of working
  - implementing full automation wherever relevant

Before implementing the Benefits Management Framework, a quick assessment of how an organisation aligns to the NSW Government Digital Strategy will help inform decisions on identifying benefits, developing a benefits plan, establishing monitoring and reporting and evaluating the program.

The sample survey in Appendix A (page 14) asks stakeholders to rate how their organisation aligns to each of the NSW Government Digital Strategy priorities. Their answers can be rated as follows:

**Always = 3 | Usually = 2 | Occasionally = 1 | Never = 0**

Stakeholders can easily quantify their scores to provide a total score or average score for each priority category. The survey could be tailored for different stakeholder groups or for different investment requirements or benefits management practice. Enabling stakeholders to consider how to build benefits management into digital service design and measure a return on investment or identify what actions are required to address any problem areas with benefits management practice. The survey findings could also be used to benchmark assessments across NSW clusters.

For scores less than 28, review the recommendations in Section 4 below to identify possible improvements. For scores less than 20, also review the considerations on critical success factors above. For more information, see Part 3: Guidelines on the challenges typically encountered in benefits management practice and the risks that may arise from poor forecasting or program delivery issues. Also see Part 1: Principles for the principles that underpin the recommendations in the table below.

# 4. Recommendations

## 4.1 Assessment recommendations

The findings from the assessment analysis can inform which areas need to improve when implementing the framework for a digital government. It is recommended that a pragmatic approach to implementing the framework is taken, with each organisation deciding which benefits management maturity level would be optimal for its needs at a given time. Every organisation does not need to achieve a high level of benefits management maturity.

## 4.2 Recommendations for each phase

The following table outlines the processes and deliverables for each phase explained in Part 2: Process and Part 3: Guidelines, giving recommendations on what should be considered at each phase, if the stakeholder organisation has a low level of benefits maturity or digital capability. It would be useful to read the table alongside Part 3: Guidelines and the templates in Part 5: Glossary.

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**It is recommended that a pragmatic approach to implementing a framework is taken**

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## 4. Recommendations (cont.)

### Phase 1: Understand

#### Process

- Articulate the vision/objectives/key principles
- Identify key stakeholders
- Identify benefits collaboratively with stakeholders
- Map the outcomes and benefits with stakeholders
- Develop a benefits realisation strategy
- Obtain sponsorship buy in and ownership of benefits

#### Deliverables

- Benefits Realisation Strategy
- 3 Column Analysis
- First draft benefits map
- Benefits Distribution Matrix

#### Considerations (for organisations with lower levels of maturity and capability)

##### Identify benefits

- explain to stakeholders benefit management principles and terms before developing benefit deliverables. To help stakeholders understand what a benefit means to them.
- Identify benefits with stakeholders using techniques such as 3 column analysis
- to enable stakeholders to understand how the program objectives align with strategic goals

##### Map benefits

- develop a benefits map that shows a clear line of sight between program need, activity and the intended benefits. This will help stakeholders to understand how the program objectives align with strategic goals
- use simpler mapping techniques or develop a high-level map with stakeholders
- consider using benefit mapping software only to inform stakeholders. In practice it can be difficult to use software in a workshop

##### Develop benefit realisation strategy

- think evaluatively on why the program is needed, review questions and template

##### Obtain sponsorship buy-in

- agree on benefits owners
- it is essential that the impact of the program on different stakeholders be understood. A simple tool is the benefits distribution matrix in Part 3

## 4. Recommendations (cont.)

### Phase 2: Plan

#### Process

- Classify benefits
- Identify benefit measures
- Value benefits
- Create benefits register
- Develop benefits profiles
- Establish governance
- Confirm benefit ownership
- Develop benefits plan
- Inform business case

#### Deliverables

- Benefits plan
- Benefits profiles (included in plan)
- Benefits register or benefit tracking tool

### Considerations (for organisations with lower levels of maturity and capability)

#### Classify benefits

- classify benefits into structured categories to help stakeholders prioritise benefits, see Part 3 for recommended classification of financial and non-financial benefits.

#### Identify benefit measures

- limit the number of measurable benefits, ideally 6-10
- choose measures that will give an early indication of progress
- choose measures with existing data sources
- agree measures that will show intended intermediate and end benefits
- obtain baseline measures for each chosen benefit
- obtain sign-off of benefit forecasts and baselines using a benefits profile
- align benefits with measures for strategic objectives
- use the KPIs in Digital Service Standard measuring digital services see Part 3, at a minimum should measure
  - user satisfaction
  - digital take-up
  - completion rate
  - cost per transaction
- consider how the digital data could be used to, provide more certainty on cost and benefit estimates
- consider how user satisfaction, digital take-up, completion rates could improve understanding on stakeholders impact or user needs, or service performance

#### Value benefits

- value benefits using standard discount rate and sensitivity analysis in NSW Government Guide to CBA,
- use data to inform value for money analysis,
- if a portfolio prioritisation is not established develop a criteria for prioritising financial benefits such as calculation method aligns with NSW Government Guide to CBA or high confidence levels in realising benefit, documenting all assumptions

#### Benefits register

- use at minimum, the benefits register to record and monitor data, see template.
- adapt the benefit register template to the organisational style if useful,
- If digital capability is more mature, determine which software or service design is appropriate for collecting, managing and analysing data

#### Benefits plan

- align activities in benefit plans with defined program stages or other business processes or frameworks.
- integrate benefit profiles, benefit register and benefit map into benefits plan, to maintain version control



## 4. Recommendations (cont.)

### Phase 3: Manage and Report

#### Process

- Operationalise the benefits register or benefits tracking tool
- Agree final targets with benefit owners
- Monitor program progress
- Review progress against business case/baseline
- Update benefits plan, benefit register or tracking tool
- Establish reporting on progress
- Handover benefits reporting and measurements to BAU team

#### Deliverables

- First benefits report
- Updated benefits plan
- Updated benefits register

#### Considerations (for organisations with lower levels of maturity and capability)

##### Benefit report

- digital capability will inform data content format of reports and how reports are prepared
- use at minimum, the benefits register to report, see template. Consider if the template should be adapted to the organisational style
- ensure that the content of the benefits report provide a transparent overview of benefits realisation for easy comparison between the business case forecast and current progress
- review measures and activities on a formalised basis as part of a regular governance meeting
- if digital capability is more mature establish a benefit tracking tool to collect, manage and analyse data digitally. See Digital Service Standard for guidance on the Performance Dashboards.

### Phase 4: Evaluate

#### Process

- Clarify the purpose and scope of the evaluation phase
- Review the benefits deliverables
- Conduct post-implementation review to inform corrective action
- Capture lessons learnt to inform continuous improvement
- Report the results

#### Deliverables

- Updated benefits report
- Updated benefits register
- Business case variation report
- Lessons learned report

#### Considerations (for organisations with lower levels of maturity and capability)

- prepare for evaluation phase by maintaining document versions on appropriate data storage and information sharing software
- review requirements of NSW Government Program Evaluation Guidelines to prepare evidence base for an independent evaluation if required
- obtain information on what worked well for other programs within the organisation
- obtain organisational templates for learned Lesson reports or business case variation reports.

## 4. Recommendations (cont.)

### 4.3 Governance recommendations

Governance is key to implementing benefits management, as benefits need to be owned by appropriate sponsors and managers from within the organisation. To support active program sponsorship at the senior leadership and executive level:

- develop a program vision statement, to be promoted by senior leadership, to assist with the transformational change required to realise the program benefits.
- review the underlining principles of benefits realisation management outlined in Part 1: Process and how these principles support each phase of benefits management in the governance section of Part 3: Guidelines
- use benefits management deliverables to clearly articulate the program outcomes and intended benefits
- when possible, manage, report and approve benefit deliverables within existing governance meetings, noting that the size, complexity, priority and risk of a program and its benefits will affect the level of governance required to control its delivery and benefit realisation
- when possible, integrate benefits management processes with other business processes or NSW Government frameworks used within the organisation
- use the 'RACI' (Responsible, Accountable, Consulted Informed) in Part 3: Guidelines to review and agree on responsibilities for managing and realising benefits
- use the key roles and responsibilities table in Part 3: Guidelines to help with defining and agreeing on the roles involved for each phase of benefits management and their level of accountability
- adapt the organisation standard role descriptions to include responsibilities for benefits management. For smaller projects, avoid recruiting to the position description as some functions may be performed by staff already in place.

### 4.4 Documentation recommendations

The terminology, language and style of an organisation should be used when adapting the benefits management processes and templates. Using familiar terminology and language will provide consistent communication across program and business areas. Also, it will help to accelerate adoption and ensure continued use of the framework.

# Appendix A: NSW Digital Strategy priorities – self assessment

Always = 3 | Usually = 2 | Occasionally = 1 | Never = 0

Maturity	Always	Usually	Occasionally	Never
<b>Customer experience</b>				
1. Services are digital by default				
2. Services based on identified customer needs and digital capability				
3. Collaboration across the sector to design seamless and integrated services, using common standards and platforms where appropriate				
4. Services are accessible and easy to use for all customers and provide for differing levels of digital literacy				
<b>Data</b>				
5. All investment decisions, policies and service delivery models are informed by data insights				
6. Data is open, collected and shared in a digital format wherever possible.				
7. Agencies open their data in a format that can be readily used				
8. Data is published in real time where possible.				
9. Visualisation and mapping tools ensure accessible and actionable insights from data				
10. Customer data is protected in accordance with NSW privacy law				
<b>Digital on the inside</b>				
11. Government processes are designed around the needs of users				
12. Processes are streamlined within clusters to eliminate duplication, and whole of government platforms are used to increase efficiency				
13. Job tasks which are routine, repetitive, structured and rules based are fully automated (where appropriate) to free up time for higher-value tasks				



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# Benefits Realisation Management Framework

## Part 5: Glossary

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## **Part 1: Principles**

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## **Part 2: Process**

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## **Part 3: Guidelines**

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## **Part 4: Implementation**

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## **Part 5: Glossary**



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# Benefits Realisation Management Framework

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**A standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across NSW Government.**

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## **The Framework:**

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- must be accessible by strategy groups, operational business areas and program/ project teams as well as by individual practitioners and benefit owners
- should help PMO practitioners improve their decision making and become better at implementing beneficial change.



# 1. Glossary

Terminology or Acronym	Explanation/Meaning
<b>Baseline Measure</b>	<p>A measure of the 'as-is' or 'before' state, prior to implementing a change to derive a benefit.</p> <p>Baseline data is established so that the benefits measurement at a point in time can be compared to the position prior to delivery of new capabilities or outcomes.</p>
<b>Benefit</b>	<p>The measurable improvement resulting from an outcome perceived as an advantage by one or more stakeholders, which contributed towards one or more organisational objective(s).</p>
<b>Benefit Classification</b>	<p>A benefit classification can be one or many of the following:</p> <ul style="list-style-type: none"><li>• Financial with sub-categories cashable and non-cashable including increased revenue, cost avoidance, reduced cost or</li><li>• non-financial with sub-categories including improved performance, social, economic and environmental benefits, enhanced user experience.</li></ul> <p>For more information see Part 3: Guidelines.</p>
<b>Benefit Distribution Matrix</b>	<p>A matrix mapping the stakeholders to each benefit to understand which stakeholders may be advantaged or disadvantaged by the program.</p>
<b>Benefit Map</b>	<p>A map linking benefits to the primary investment objectives, outlining the cause and effect relationships.</p> <p>Examples include:</p> <ul style="list-style-type: none"><li>• MSP Benefits Map – Managing Successful Programmes (UK)</li><li>• The Results Chain TM– DMR Group, John Thorp</li><li>• Benefits Dependency Network– Cranfield University.</li></ul>
<b>Benefit Owner</b>	<p>The person responsible for the realisation of the benefit.</p>
<b>Benefit Profile</b>	<p>A template that contains a description of a single benefit, including all its attributes and dependencies as well as measures and estimated value.</p>
<b>Benefit Realisation Manager</b>	<p>Responsible for facilitating the realisation of benefits, including the profiling, planning and tracking of benefits across the cluster.</p>
<b>Benefit Realisation Management (BRM)</b>	<p>The process of organising and managing so that potential benefits arising from investment in change, are actually achieved. It is a continuous process running through the whole project lifecycle and should be the central theme of any change initiative. Benefits realisation is the end product of the implementation of change initiatives.</p>
<b>Benefit Plan (BP)</b>	<p>A benefits plan defines the benefits of the overall program and the responsibilities for their realisation, measurement, reporting and evaluating.</p>

## 1. Glossary (cont.)

Terminology or Acronym	Explanation/Meaning
<b>Benefits Register (BR)</b>	A register encompassing all quantitative and qualitative benefits with details on how each benefit has been determined, the calculation method used, key trigger points and phasing, target dates for realisation, KPI benchmarks and identification of the benefit owner and benefit manager. Can also be called a Benefit Tracking Tool.
<b>Benefit Realisation Strategy</b>	A benefit realisation strategy identifies, at a high level, how benefits are aligned to the organisation's strategy. It describes the end goal and the required direction for the organisation. It is used for communicating expectations and assessing the impact of unexpected changes, both internal and external. A benefits realisation strategy template is available in Part 5: Glossary.
<b>Benefit Types</b>	<p>Benefits are commonly categorised:</p> <ul style="list-style-type: none"> <li>• Financial with sub-categories cashable and non-cashable including increased revenue, cost avoidance, reduced cost or</li> <li>• non-financial with sub-categories including improved performance, social, economic and environmental benefits, enhanced user experience.</li> </ul> <p>For more information see Part 3: Guidelines.</p>
<b>Business Change</b>	A change which is required to support the implementation of an Enabler e.g. new governance, training and communications etc.
<b>Cashable benefits</b>	Cash realising benefits are changes that will directly reduce an organisation's budget either through savings or through additional revenue.
<b>Corporate and Shared Services Reform (CSS) Program</b>	The DFSI CSS program is responsible for the consolidation and amalgamation of back office services to contemporise administrative processes and systems, reducing the total implementation and operating costs, while improving performance.
<b>Cost Reduction Benefit</b>	A cost reduction benefit is a previous cost that no longer applies or is reduced year over year.
<b>Cost Benefit Analysis</b>	An appraisal and evaluation technique that estimates the costs and benefits of a project or program in monetary terms. See NSW Treasury TPP 17-03 Policy and Guidelines Paper NSW Government Guide to Cost-Benefit Analysis.
<b>Decreasing Benefit</b>	A positive change that is identified as continually progressing down to an expected target.
<b>Dis-benefit</b>	A measurable decline resulting from an outcome perceived as negative by one or more stakeholders, which reduces one or more organisational objective(s).
<b>Discounting</b>	Technique to convert future costs or benefits to present values using a discount rate. See NSW Treasury TPP 17-03 Policy and Guidelines Paper NSW Government Guide to Cost-Benefit Analysis.
<b>Double Counting</b>	Is a term used to describe the situation where the same benefit cannot be claimed by two or more stakeholders (i.e. no double counting).

## 1. Glossary (cont.)

Terminology or Acronym	Explanation/Meaning
<b>Effectiveness</b>	An outcome type where the degree to which benefit(s) are achieved and the extent to which targeted problems are resolved. Effectiveness is determined without reference to costs and means doing the right or targeted activity.
<b>Efficiency</b>	An outcome type where benefit(s) are achieved and results in doing an activity faster or with less effort.
<b>Enabler</b>	An enabler is something that can be developed/built/acquired normally from outside the environment in which it will be embedded and where the benefits will be realised. Examples include a new IT system and business process.
<b>End Benefit</b>	An ultimate benefit of a program or project.
<b>EPMO</b>	Enterprise program management office.
<b>Evaluation</b>	A rigorous, systematic and objective process to assess the effectiveness, efficiency, appropriateness and sustainability of programs. See NSW Government Program Evaluation Guidelines.
<b>Financial Benefit</b>	A benefit type with a positive change which is contributed by one or many measures and is quantified with tangible financial measures.
<b>Governance Structure</b>	The organisation and processes needed to govern a program or project.
<b>Gross Benefit</b>	A result or value where the cost of delivering the capability or the new 'to-be' process (the so-called dis-benefit) is not taken from the gross (financial) benefit value.
<b>Intermediate Benefit</b>	Benefits which will occur between the implementation of early changes and the realisation of the end benefits (also referred to as enabling benefits).
<b>Internal Rate of Return (IRR)</b>	The annual percentage return (forecast or actual) from an initiative, at which the present value of the total cash inflows equals the present value of the total cash outflows. See NSW Treasury TPP 17-03 Policy and Guidelines Paper NSW Government Guide to Cost-Benefit Analysis.
<b>Key Performance Indicators (KPIs)</b>	Quantitative or qualitative variable that provides a reliable way to measure intended changes. Performance indicators are used to observe progress and to measure actual results as compared to expected results.

## 1. Glossary (cont.)

Terminology or Acronym	Explanation/Meaning
<b>Measure</b>	A measure is the agreed performance indicator used to contribute to the achievement of a benefit. A measure is calculated from one or many metrics.
<b>Net Benefit</b>	A result or value where the cost of delivering the capability or the new 'to be' process is taken from the gross or total (financial) benefit value.
<b>Non-cashable benefits</b>	Non-cashable benefits are changes that will result in an organisational efficiency but not necessarily a budget reduction. These may address long terms problems, including saving money in the future, or avoiding future procurement costs.
<b>Non-financial Benefit</b>	A benefit type that can be categorised as those quantified in non-financial terms or in qualitative terms. Examples include client satisfaction and loss of reputation.
<b>NVP</b>	Net Present Value: the value of future cash flows (inflows less outflows) discounted at the relevant cost of capital. See NSW Treasury TPP 17-03 Policy and Guidelines Paper NSW Government Guide to Cost-Benefit Analysis.
<b>One-Off Benefit</b>	A benefit that is achieved only once and is not recurrent or repeating.
<b>Optimised Benefits</b>	Benefits which have been maximised in a balanced manner i.e. obtaining best returns on overall investment given the desired outcomes of the project/program.
<b>Outcome</b>	A result or effect that is caused by or attributable to the project or program.
<b>Outcome Based Budgeting</b>	Budget technique that demonstrates a clear linkage between allocated funding and the intended program outcomes.
<b>Program Sponsor</b>	The person who owns the business case and therefore is accountable for realising the benefits (usually Deputy-Secretary or Secretary level).
<b>Risk</b>	An uncertain event or set of events that, should it occur, will have an effect on the achievement of objectives.
<b>Strategic Goals</b>	Describe how an organisation wishes to change in order to evolve and grow.
<b>Target</b>	A target is the agreed, approved 'to-be' result or value that is expected to be achieved as a result of the project deliverables.
<b>Target Measure</b>	A measure which, when achieved, will demonstrate that the benefit has been realised. To determine the target measure, a baseline measure has to be taken.
<b>Three-Column Analysis</b>	The three-column analysis involves brainstorming answers with relevant stakeholders to understand and agree on the current business problem, what has to change (and what must be stopped) and the benefits.

# 2. References

## 2.1 Principal policy documents and guides

### NSW Treasury

- [Business Case Guidelines](#)
- [Guide to Cost Benefit Analysis](#)

### NSW Department of Finance, Services and Innovation

- [Government Digital Strategy](#)
- [ICT Assurance Framework](#)

### Infrastructure NSW

- [Infrastructure Investor Assurance Framework](#)

### NSW Department of Premier & Cabinet

- [Program Evaluation Guidelines](#)

## 2.2 Literature

- Benefit Realisation Management (second edition): A Practical Guide to Achieving Benefits Through Change – Gerald Bradley, Gower Publishing Ltd, UK 2010
- Managing Benefits – Steve Jenner, APMG, UK 2014
- Managing Successful Programmes – APMG, UK 2018
- Managing Successful Projects with Prince2– Axelos, UK 2017
- Portfolio, Programme and Project Management Maturity Model (P3M3®) – Axelos, UK 2018
- Audit Office New South Wales *Why large public sector projects sometimes fail*  
Retrieved 04 December 2018 from <https://www.audit.nsw.gov.au/news/news-archive/2013/paper---why-large-public-sector-projects-sometimes-fail> last updated 20 September 2013

### BRM Framework

[www.finance.nsw.gov.au/publications\\_and\\_resources/benefits\\_realisation\\_management\\_framework](http://www.finance.nsw.gov.au/publications_and_resources/benefits_realisation_management_framework)

### Commonwealth Government of Australia

[www.dta.gov.au/standard/](http://www.dta.gov.au/standard/)

- Digital Service Standard

# 3. Templates

Below is a list of templates that are referenced in the four key phases of the NSW Government Benefits Realisation Management Framework.

Phase	Template
Understand	<ul style="list-style-type: none"><li>• Benefits realisation strategy</li><li>• Three-column analysis</li><li>• Benefits map</li><li>• Benefits distribution matrix</li></ul>
Plan	<ul style="list-style-type: none"><li>• Benefits plan</li><li>• Benefits profiles</li><li>• Benefits register</li></ul>

These templates are available on the DFSI website:

[www.finance.nsw.gov.au/publication-and-resources/benefits-realisation-management-framework](http://www.finance.nsw.gov.au/publication-and-resources/benefits-realisation-management-framework)



[BRMFramework@customerservice.nsw.gov.au](mailto:BRMFramework@customerservice.nsw.gov.au)



Treasury

August 2018

**TPP**

**18-06**

Policy and Guidelines Paper

# NSW Government Business Case Guidelines



## Preface

The NSW Government Business Case Guidelines have been developed to assist agencies and government entities with the preparation of business cases in line with best practice.

The NSW Government is committed to the ongoing improvement of public services by ensuring resource allocation decisions are made and public funds are spent in the most efficient way and are directed to services that provide the best outcomes and benefits for New South Wales.

Business cases are a key tool to inform evidence-based investment decisions by government. These decisions include policy and program interventions utilising scarce community resources to deliver outcomes for the people of NSW. Treasury has a central role in providing guidance to public sector entities. It aims to ensure resource allocation decisions are well timed, offer value for money, consider and mitigate risks and are consistent with Government priorities and objectives.

The NSW Government Business Case Guidelines (the Guidelines) establish a best practice, clear and consistent approach to preparing business cases. Business cases which are prepared according to these guidelines provide a robust evidence base for government policy and investment proposals and inform effective and efficient resource allocation decisions for capital, recurrent and ICT investment and regulatory proposals.

In addition, the Guidelines are designed to assist in reducing the time and cost of developing business cases, while meeting best practice. The Guidelines are supported by a suite of templates and tools.

The Guidelines will support the sector's capacity and capability to deliver investment and policy proposals that are robust, transparent and appropriate to the size, complexity and cost of the intervention. They will strengthen confidence in the government to make sound investment decisions.

This version of the NSW Government Business Case Guidelines supersedes the previous Department of Premier and Cabinet Business Case Guidelines 2000, the Treasury policy papers Guidelines for Capital Business Cases (TPP08-05) and the Commercial Policy Framework: Guidelines for Financial Appraisal (TPP07-04).

**Michael Pratt AM**  
**Secretary**  
**NSW Treasury**

August 2018

**Treasury reference: TPP18-06**

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### Note

General inquiries concerning this document should be initially directed to:  
Financial Management and Accounting Policy team of NSW Treasury ([finpol@treasury.nsw.gov.au](mailto:finpol@treasury.nsw.gov.au)).

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## Executive Summary

The NSW Government is committed to delivering efficient and effective services and developing regulations that maximise the benefit for the people of NSW.

NSW is facing many challenges, including growing demands for services, an ageing population and budget constraints. As a result, there is an increased need for Government to focus on delivering the right services that are customer centric and best meet the needs of our community now and into the future, while providing value for money and the right regulatory settings.

Fundamental to this focus is standardising and improving the requirements and criteria of resource allocation and policy impact.

The NSW Government Business Case Guidelines (the Guidelines) are designed to facilitate evidence-based resource allocation and regulatory impact decisions. The Guidelines provide a best practice guide on developing business cases. The Guidelines also provide a performance-informed resource management and regulatory framework consistent with the move to Outcome Budgeting and outcome focused regulation.

A business case captures the reasoning for initiating a project or program and is the primary document for describing how the case for change, economic and financial analysis, along with sound commercial and management analysis inform the decisions and actions for any investment proposal. It should also be a well-written and well-structured document.

Applying the Guidelines will facilitate preparing a business case based on robust logic that links the proposed investment and policy intervention with immediate and long-term outcomes and benefits, including strategic Government priorities, i.e. State Outcomes. Critical parameters such as cost, time, limitations, quality, social and environmental benefits should be documented, along with an assessment of the agency's capability for timely delivery of the project or program.

The Guidelines have been developed to be adaptable to business cases for projects of all types and sizes. They should be scaled to the size, complexity, level of risk and estimated cost on a case-by-case basis. The scope of the Guidelines extends from the initial stages in the investment process where analysis is used to support a funding decision, through to retrospective analysis of the benefits of an investment after its completion.

While the Guidelines have been developed to support better investment decision making, they can also be applied to regulatory and policy interventions that involve costs and benefits for government and the wider community. The wider application caters for the need to understand the impact of government action by considering the costs and benefits of a range of options, including non-build and non-regulatory options.

There has been a move to develop different types of business cases including integrated program, vision led, place-based, spatial and corridor projects and agile business cases. The Guidelines may need to be adapted for these types of interventions. Treasury will work with other agencies through a Community of Practice to co-design, where necessary, additional guidance to address these types of business cases over the next three to eighteen months. The principles of preparing a business case in these guidelines nevertheless remain the same. If you are currently preparing business cases for these types of projects, please contact your Treasury analyst.

The Guidelines supersede the previous Department of Premier and Cabinet Business Case Guidelines 2000, the Treasury policies - Guidelines for Capital Business Cases (TPP08-05) and the Commercial Policy Framework: Guidelines for Financial Appraisal (TPP07-04).

When compared to these previous publications, the following outlines the key features and main changes in the Guidelines:

- Step-by-step, user-friendly guidance on preparing business cases for capital, recurrent and ICT investment, and also for policy and regulatory interventions
- Staged and iterative approach for the development of business cases with emphasis on facilitating early engagement with Treasury
- Scalability of the evidence required based on size and risk of the intervention and/or investment
- Strong emphasis on benefits identification, management and realisation from the case for change all the way to post project implementation
- References to existing and related NSW Government policy papers, guidelines and circulars.

### **Acknowledgements**

NSW Treasury wishes to acknowledge everyone who contributed to the development and production of these Guidelines, and the many NSW Government agencies that participated in the extensive consultation process.

NSW Treasury also wishes to acknowledge Department of Treasury and Finance, Victoria; HM Treasury, United Kingdom; and the New Zealand Treasury; whose documentation and processes were used as sources in the development of these Guidelines.

# 1. About the Business Case Guidelines

The NSW Government aims to meet the expectations of the people of NSW by making investments and regulatory decisions that maximise both the value for taxpayers' dollars spent and contribute towards achieving outcomes that benefit the people of NSW. Fundamental to this focus is standardising and improving the requirements and criteria of resource allocation and policy impact.

Developing a business case is the first step in ensuring the effective and efficient allocation of resources or regulatory powers. It puts outcomes and benefits at the centre of investment decision-making and allows opportunities for appropriate innovation while balancing risks to people, the environment and the State's finances. A business case should support the decision to invest and/or regulate, the selection of options and the successful realisation of anticipated benefits.

The Business Case Guidelines can be adapted to apply to business cases for projects of all types and sizes. They should be scaled to the size, complexity, level of risk and estimated cost on a case-by-case basis. The scope of the Guidelines extends from the initial stages in the investment process where analysis is used to support a funding decision, through to retrospective analysis of the benefits of an investment after its completion.

While the Guidelines have been developed to support better investment decision making, they can also be applied to regulatory and policy interventions that involve costs and benefits for government and the wider community. The wider application caters for the need to understand the impact of government action by considering the costs and benefits of a range of options, including non-build and non-regulatory options.

## 1.1 Purpose of the Business Case Guidelines

---

A business case is an essential component of planning and investment decisions. The purpose of these Business Case Guidelines (the Guidelines) is to assist agencies, other government entities, investors and decision makers to develop effective and robust business cases.

The Guidelines:

- apply to all types of investment proposals - capital, recurrent and, information and communication technology (ICT) - and to policy proposals that impact resource use in the community such as changes to regulations
- improve the standard, transparency and robustness of investment, policy and regulatory proposals to better inform decision making including evidence based Cost Benefit Analysis (CBA)
- are scalable, so that the level of effort expended on developing a business case is appropriate for the size, complexity and risk of the proposed intervention
- support outcome-based regulation, budgeting and reporting
- link the proposed intervention with outcomes, including strategic Government priorities i.e. State outcomes
- consolidate relevant referencing sources for all types of business cases in one document. There may, however, be additional resources, specific to the nature or type of project or program that should also be considered.

Applying the Guidelines is encouraged when a critical investment, policy and/or regulatory decision is contemplated. They provide a best-practice approach on the key elements of a business case for projects of any type, size or risk and are supported by a suite of templates and tools that complement each stage of the business case process.

There has been a move to develop different types of business cases including integrated program, vision led, place-based, spatial and corridor projects which involve multiple agencies and sectors delivering the same Government priorities and State outcomes in a region. There has also been a shift toward agile business cases that involve adapting for incrementally developing projects, where assumptions and facts may not be known at the start. This will require regular updates to the business case and assumptions, and may include requesting early funding for the development stages.

For these types of projects, it may be necessary to adapt the Guidelines. For example, vision led projects may involve identifying overarching needs that are more remote than those identified in a traditional project, while still requiring evidence to support government intervention. The principles of preparing a business case in these guidelines nevertheless remain the same.

NSW Treasury will work with agencies to provide additional guidance, where necessary, to address these types of business cases over the next three to eighteen months. In addition, a Community of Practice will be formed to facilitate the co-design and development of any further guidance. If you are currently preparing business cases for these types of projects please contact your Treasury analyst for assistance and advice.

## 1.2 How to use these Guidelines?

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The Guidelines can be used as a source of content and as a road map for the development of a business case. The Guidelines contain the steps needed to prepare a detailed business case that demonstrates that a proposed intervention is based on a case for change, represents value for money, is financially and commercially viable and can be achieved.

The Guidelines should be applied when developing, assessing or approving spending and regulatory proposals. They are particularly relevant for:

- program and project managers, responsible for successful program/project delivery
- managers of services, with responsibility for developing and delivering programs with customer-focused outcomes
- managers of finance, procurement and planning, with responsibility for the forward planning of operational aspects of an investment proposal
- employees of agencies with strategic responsibility for approving proposals and overseeing the effectiveness of regulatory arrangements
- gateway reviewers responsible for conducting assurance services on projects and programs
- those responsible for evaluating programs and projects that have been implemented
- central agencies that advise Cabinet, Cabinet Standing Committee on Expenditure (ERC) or Cabinet Infrastructure Committee (CIC) on funding and policy proposals.

The Guidelines have been developed to be adapted and applied to projects of varying sizes, complexities and risks. It is important to adapt the size and level of detail of the business case to the specific type of project.

Feedback and consultation in the early stages is important. Planning for the business case development should include liaising with key decision-makers who will also use the business case, e.g. NSW Treasury, Infrastructure NSW or Department of Finance, Services and Innovation. In some instances, the Guidelines may reference other resources for additional information, e.g. NSW Government Guide to Cost Benefit Analysis (TPP17-03). In conjunction with the Guidelines, agencies will need to be familiar with other related NSW Government policies and processes, including Gateway review process, Commissioning and Contestability, Better Regulation and Outcome Budgeting.

A summary of the policies mentioned in this document and related to investment decisions will be available on the [NSW Treasury website](#).



## 2. Purpose of a Business Case

### 2.1 What is a Business Case?

---

There are many definitions of a **business case** but NSW Government decision makers use the following definition:

A **business case** is a documented proposal to meet the Government's objectives that is used to inform an investment and/or policy decision. It contains analyses of the costs, benefits, risks and assumptions associated with various investment and policy options linked to policy or program outcomes and informs future implementation, monitoring and evaluation.

In practice, a **business case** is a management tool and a living document which is developed over time and reflects the priorities of investment stages – from making a case for change at the concept stage all the way through to implementation and review. It is a multi-purpose document that can generate the participation necessary to turn an idea into reality. The business case summarises in one place, research and analysis of how proposals will contribute to key investment objectives and reflect the strategic context.

The business case provides the basis against which continued funding is compared and evaluated and against which the success of the investment and/or policy intervention is measured.

### 2.2 What are the characteristics of a good business case?

---

A good business case should:

- outline the relevant information and arguments for a recommended action, that informs investment, policy and regulatory decisions
- provide a succinct, clear, logical and user-friendly structure and content. The size of the business case is not a guarantee of quality
- minimise costs and time through clear purpose, requirements and early planning at the outset
- integrate project and post implementation evaluation into the process
- reflect stakeholder views and integrate consultation outcomes
- convince through arguments, that are optimally supported by hard data, including accurate costing of alternatives and expected benefits
- provide reference of previous experiences and outcomes in implementing similar initiatives
- consider risk, governance and value for money throughout the development process
- be a living document, that is continuously updated and reviewed.

## 2.3 When should a business case be prepared?

---

Business cases are prepared for different reasons, including to:

- inform an investment or regulatory decision
- demonstrate that adequate due diligence and thinking was undertaken
- obtain approval including funding.

Business cases are prepared and submitted to NSW Treasury as part of the annual outcome-based Budget process to inform Cabinet Committee consideration of proposals and expenditure decisions made by the Cabinet Standing Committee on Expenditure Review (ERC). Submission of business cases should align with the timing of the NSW Budget process, as advised to agencies annually by Treasury. ERC considers all proposals submitted to Treasury, including in exceptional circumstances those needing additional funding that cannot wait for the annual Budget process.

Business cases may also need to be submitted to Infrastructure NSW, the Department of Finance, Services and Innovation and Treasury as part of the Gateway review process as required under the relevant Gateway Coordination Authority Framework.

Business cases can also be produced for policy and regulatory proposals that may not involve significant expenditure, but have a significant impact on the community, economy and environment. A business case, incorporating a CBA or a Better Regulation Statement, provides an ideal format to provide Ministers and Cabinet with the information required to make significant policy and regulatory decisions.

It is good practice to prepare business cases for significant proposed investments as part of an agency's **internal prioritisation** and decision-making process within an appropriate governance framework.

### Further information:

- Recurrent Investment Assurance Framework (TPP17-02)
- Infrastructure Investment Assurance Framework (INSW), December 2016
- ICT Assurance Framework (NSW ICT Strategy), February 2017
- NSW Gateway Policy (TPP17-01)
- Submission of Business Cases TC 12-19.

## 2.4 How much time should be spent in developing a business case and who should prepare it?

---

There is no prescribed 'size' for a business case. It may be a short document of minimal pages that can be completed in a few days, containing all relevant aspects including key objectives, costs, benefits, risks and stakeholders. Conversely, a large or complex project will likely involve more detailed and robust analysis requiring many months to prepare and a more resource intensive process.

The time required to develop a business case will depend on a multitude of variables related to the proposal such as:

- complexity of the proposal
- size in terms of funding involved
- potential risks arising from possible impacts
- the availability of evidence
- actors involved in the proposal development e.g. one cluster or cross cluster
- number and type of stakeholders impacted e.g. internal or external
- criticality of service, e.g. substantial impact to existing service delivery processes
- degree of innovation and time involved in the realisation of benefits.

In certain instances, it may be necessary to initiate a trial or pilot project to test the feasibility of a specific approach especially when the information necessary to make decisions is only vague or not yet available.

This is particularly the case when developing a business case for agile projects. An agile project is based on the idea of delivering incremental or interim outputs, rather than delivering a final output at the end of the planned time. In this case a separate business case reflecting a similar structure to the traditional business cases will be needed to support the pilot project. The main difference is a more continuous adaptation of the business case and less accurate estimates in the initial stages.

The agency is responsible for ensuring that **the cost of developing a business case is proportionate to the size, risk and complexity of the potential investment** and remains appropriate at any time, including when outsourcing parts of the business case development to external providers.

The evidence and information required to develop a business case usually sits with the organisation submitting the investment proposal. It is recommended, therefore, that agencies **foster internal capabilities in the development of business cases**. Responsibility for the development of the business case should not be outsourced to external consultants. Rather external consultants can assist in developing the business case where the necessary skills and resources are not available within the agency.

Note that confidentiality arrangements that are consistent with the treatment of Cabinet information must be in place if 'third parties' or external consultants are involved in developing business cases for Cabinet submission.

The Business Case templates have been developed to provide further guidance and are accessible on the Treasury website.

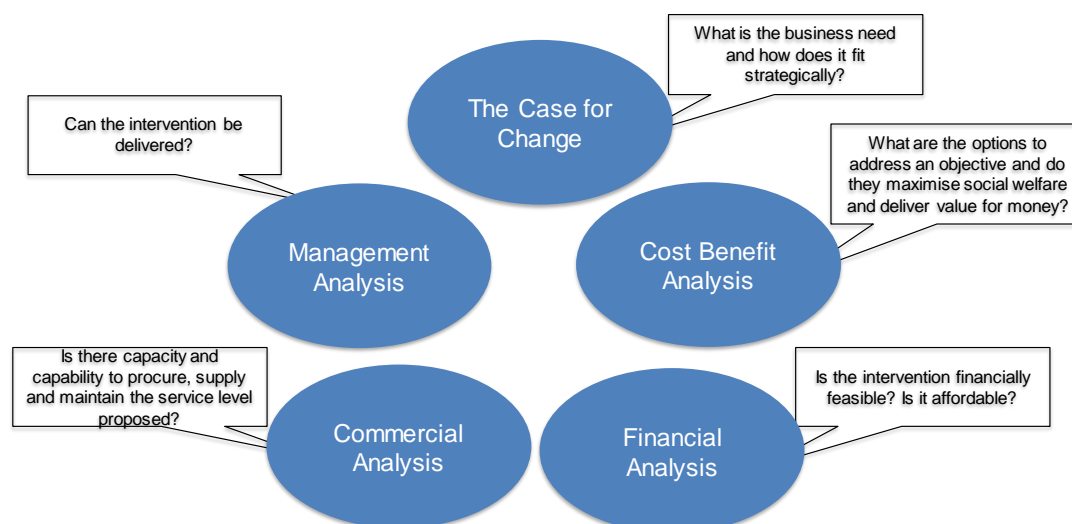
### 3. Overview of key components and stages of a business case

#### 3.1 Key components of a business case

The business case comprises five interconnected areas of analysis:

1. A **case for change** - a clear rationale for agency and government action, which addresses a community need based on an identified priority, State outcome and business case objective
2. Evidence appropriate options (solutions) selected to achieve the required objective(s) and benefits, maximise **social welfare and deliver value for money (cost benefit analysis)**
3. Evidence that appropriate options (solutions) are financially **viable (financial analysis)**
4. A demonstration that the delivery agency has the capacity and capability required to procure, implement and maintain the proposal and realise the benefits anticipated (**commercial analysis**)
5. Confidence the solution put forward is deliverable, and that governance and systems are in place to optimise value and be modified if required in response to ongoing monitoring and evaluation (**management analysis**).

Figure 2.1.1. Dimensions of analysis included in the business case



**The Case for Change** confirms the service and/or policy intervention need. It is the first step in obtaining approval or the “go ahead” to progress to further stages in the business case development process. The case for change should have a clear customer focus and should be developed within the context of State Outcomes and the State’s strategic priorities. It should include a concise yet rigorous assessment of the underlying community need, or gap in current service provision and/or regulatory arrangements and how the contemplated action contributes to achieving a priority State Outcome. It will also identify the potential scope for change (investment/intervention) and the anticipated benefits and risks. The case for change should be based on the need to resolve a market failure, address equity concerns among different population segments and/or take a necessary action to achieve government objectives.

**Cost Benefit Analysis (CBA)** assesses a range of competing options that address a community, environmental or economic need and contribute to achieving the objectives identified in the case for change. It identifies the option that maximises value for the government and the public (society) by analysing the costs and benefits of a list of options and by considering external and internal factors, including impacts on the NSW community. CBA uses various techniques to estimate the economic, social and environmental costs and benefits of a project or program in monetary terms including items for which there is no market value.

**Financial Analysis (FA)** is used to evaluate whether a proposed project is financially viable from the perspective of the investor and policy owner. In doing so it assesses capital and operating whole of life costs from the perspective of the entity and from a whole of government perspective where there is an impact on budget aggregates and credit rating metrics. Financial analysis differs from a CBA as it does not consider external factors, such as environmental and social impacts.

**Commercial Analysis** – includes the planning of the procurement process. The NSW Government, *NSW Procurement: Policy Framework for NSW Government Agencies (2015)*, provides a framework for agencies to achieve value for money from their procurement activities while being fair, ethical and transparent. Agencies should ensure that proposed procurement strategies align with the mandatory requirements and principles in the framework. This stage is particularly important for innovative or more complex projects/ programs that would benefit from a more in-depth market insight at early planning stages.

**Management Analysis** component should demonstrate that the preferred / selected option can be successfully delivered. This includes planning of project governance, change management, risk management, benefit realisation and project evaluation.

Each dimension or component is important, but the extent of each dimension in the business case will vary with the nature and complexity of each proposal. For example, less complex business cases that do not involve significant new procurement or new building construction, may only need relatively succinct sections on procurement and commercial analysis, or require a less complex management analysis.

These dimensions of analysis are explained in more detail in Chapters 4 to 7. The analyses should be developed iteratively as the Business Case progresses from Stage 0 (Problem Definition) to Stage 2 (Detailed Business Case) and the next steps through to Updates of the Business Case following project implementation.

## 3.2 Business case stages

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A business case is a living document that should be continuously revised and updated over time based on availability and accuracy of information.

There are three main stages related to business cases, reflecting the continuously evolving nature of the business case process:

- Stage 0:** Problem Definition
- Stage 1:** Strategic Business Case
- Stage 2:** Detailed Business Case.

In the early stages, the main purpose of the business case is to provide confidence the investment or intervention need is adequately identified and the objectives are defined and aligned with strategic priorities. Stages 1 and 2 of the business case are used to ensure that the right option for intervention is selected and the investment will be delivered as planned. In this way, the business case document and its process evolves through its stages beyond the funding decision to implementation and post-implementation planning.

The staged approach is a recommended way to scale the investment proposal depending on its size, risk and overall complexity and to ensure that regular engagement with Treasury is considered. Additionally, agencies can manage their risks by considering whether the project will proceed at the end of each stage. This enables agencies to save the cost of preparing a Stage 1 or Stage 2 business case if it is decided that the project should not proceed.

There might be instances, however, where time and other constraints do not allow for a staged approach. In these cases, the required content of the analyses should be reflected. For example, if it is not possible to engage with Treasury at Stage 0 (Problem Definition Stage), the content of the case for change should form part of the next stage (i.e. the strategic business case).

The figure below shows the stages of the business case process including their respective purpose, key steps and outputs.

**Figure 3.1: The stages of the business case**

Business Case Stages	Stage 0: Problem Definition	Stage 1: Strategic Business Case	Stage 2: Detailed Business Case	Updates and revisions of the Business Case
Purpose	<ul style="list-style-type: none"> <li>Needs analysis and confirmation</li> </ul>	<ul style="list-style-type: none"> <li>Option analysis</li> </ul>	<ul style="list-style-type: none"> <li>Option selection</li> </ul>	<ul style="list-style-type: none"> <li>Updates and revision to the business case</li> </ul>
Approach	<ul style="list-style-type: none"> <li>Identify the need for government intervention and make case for change</li> <li>Identify the problem, benefits, strategic response, costs, risks and stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Confirm the case for change</li> <li>Identify and screen options that meet the intervention objectives based on a high level analysis</li> </ul>	<ul style="list-style-type: none"> <li>Confirm way forward</li> <li>Select the preferred option based on thorough analysis</li> <li>Assess commercial and management aspects for the selected option</li> </ul>	<ul style="list-style-type: none"> <li>Updates and revision to the Detailed Business Case following funding decision or after procurement</li> </ul>
Output	<ul style="list-style-type: none"> <li>Progress with Strategic Business Case development</li> <li>If necessary, seek funding approval for the next stage based on the output of this stage</li> </ul>	<ul style="list-style-type: none"> <li>Confirm way forward</li> <li>Progress with Detailed Business Case Development</li> <li>If necessary, seek funding approval for the next stage based on the output of this stage</li> </ul>	<ul style="list-style-type: none"> <li>Preferred option confirmed</li> </ul>	<ul style="list-style-type: none"> <li>Update elements of the Case for Change, Cost Benefit Analysis, Financial Appraisal, Financial Impact Statement, Commercial Analysis and Management Analysis</li> </ul>

\*Where regulation is a likely option, the Better Regulation Principles should apply

At the commencement of each stage of the business case, it is essential to revisit all analyses up to that point, to ensure respective assumptions and findings remain valid. Each stage of the business case process is further defined through steps or actions undertaken to define it. Further detail on the steps involved in each stage is explained in chapters 4 to 7. A flow chart of these steps is provided in Appendix 1.



## 4. Stage 0-Problem Definition

### 4.1 Purpose of the Problem Definition Stage

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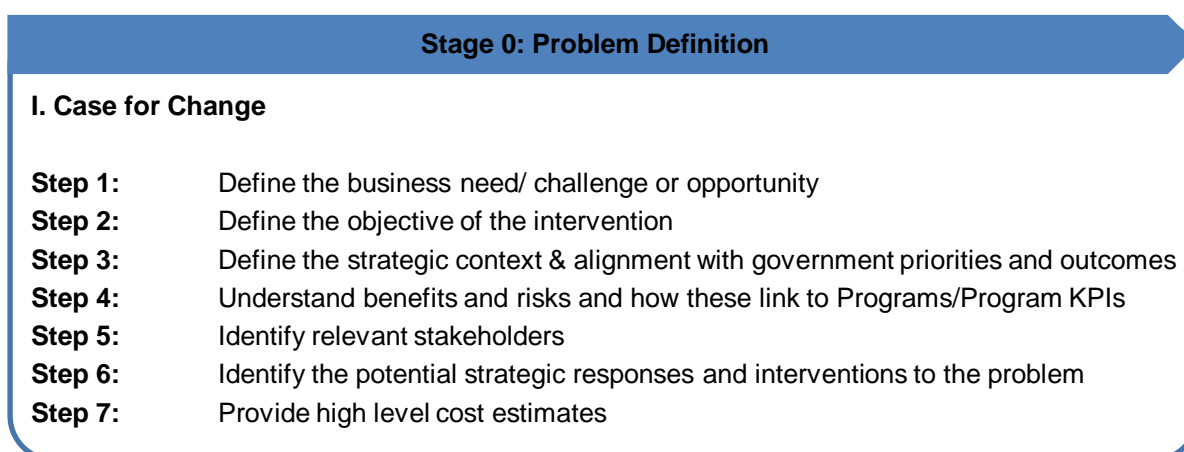
**The Problem Definition** Stage outlines the need/opportunity or the case for change, identifies the reason for government intervention and supports the decision to proceed to further stages of the business case process.

The problem definition is the primary document for a **Gate 0 review - under NSW Gateway Policy (TPP17-01)**.

### 4.2 Relevant steps

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Figure 4.2.1: Overview of steps in the Problem Definition Stage

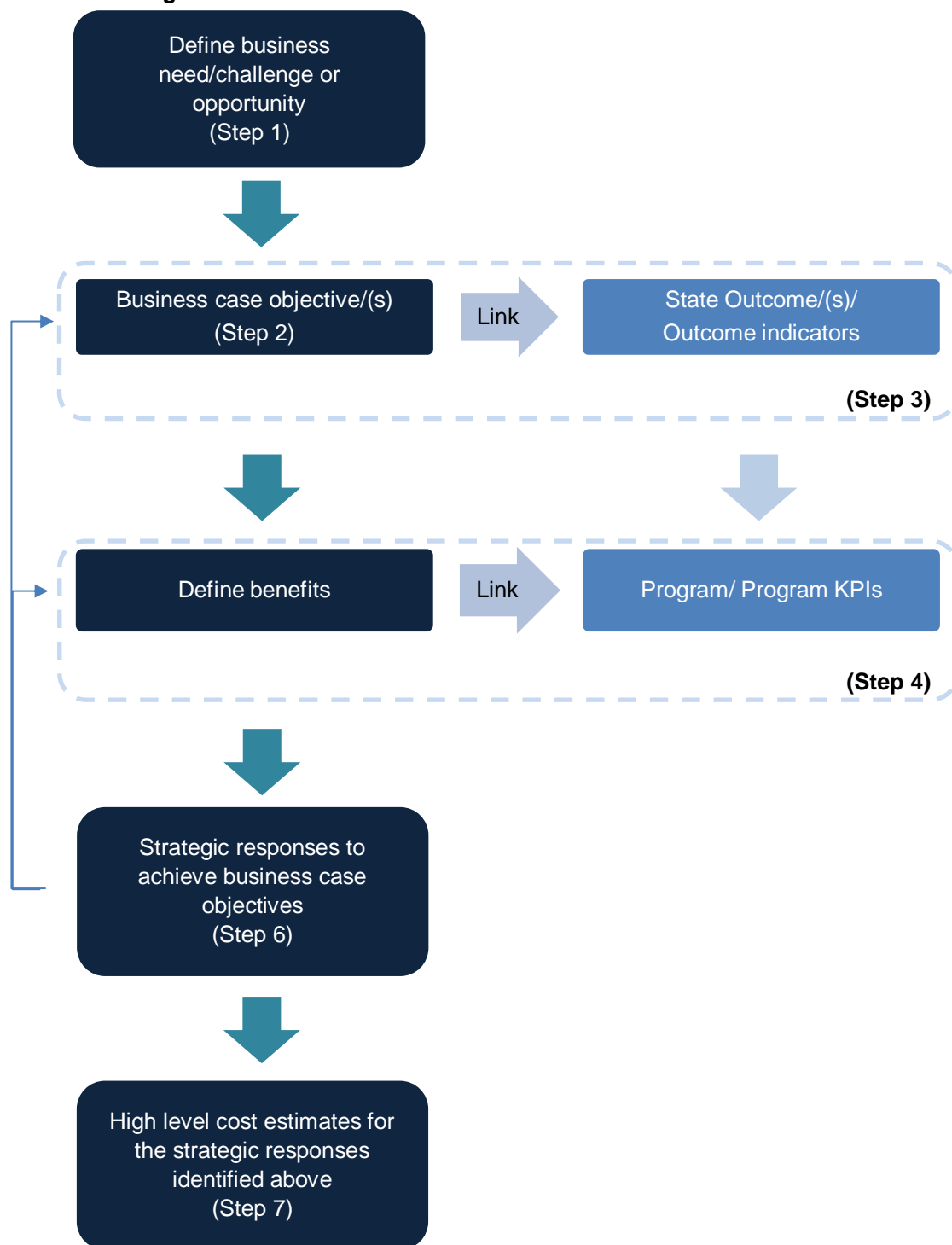


An overview of the full business case process and steps is provided in Appendix 1. Business Case Templates are provided on the [Treasury website](#) and provide guidance on preparing a Problem Definition.

The **Problem Definition** usually consists of a short, high-level document based on the evidence available at that time. Engaging with key stakeholders at the Problem Definition Stage provides an opportunity to influence the early direction of the business case to avoid expending resources on proposals that are unlikely to proceed. Key stakeholders should include the users or customers of the service where possible.



**Overview of Stage 0: Problem Definition**



**Key:**

Link explained in this step

Link strategic responses to the business case objective and benefits identified





## Step 1: Define the business need / challenge or opportunity – Reason for government intervention

The first step in making the case for change is to identify **why** change is needed. This involves identifying any unmet need, challenge or opportunity for necessary government intervention that cannot be addressed through existing arrangements.

### Describe the problem and reason for government action

Explain succinctly the **causes and effects of the problem** (need, challenge or opportunity) from a client and community perspective. This involves identifying limitations/problems faced by individuals, communities, the environment and businesses that give rise to the need for government action.

The two main reasons for government action are:

- **improved allocation of resources** in case there is a market failure
- **promotion of equity** where the distribution of economic costs and benefits is considered inequitable.

### Understand the magnitude of the problem

The business case should identify existing evidence on the key triggers of the problem and timing considerations, e.g. why it should be dealt with by the Government now rather than later. This could include succinct references to current and projected trends, demand drivers and evidence from stakeholders.

#### Example of a market failure that triggers government actions and policy change Tobacco consumption

**Definition:** Market failure refers to a situation where the market fails to supply a socially optimal amount of a good or service.

**Background:** Smoking cigarettes is a personal consumption choice for individuals. However, there are market failures that cause a higher level of consumption than is optimal.

- Smoking imposes **negative externalities on non-smokers**: Smoke from cigarettes is harmful to individuals who are not a direct party to the transaction (in the form of passive smoking) because it can damage their health.
- **Inadequate information** about the harmful and addictive effect of smoking causes an over-consumption of cigarettes. Lack of knowledge of the harmful and addictive effects of cigarette smoke can cause individuals to smoke more than they might otherwise, damaging their health in the future.

To address these market failures, the State and Federal Governments have enacted several solutions, including:

- Taxation on cigarettes to reduce the number of people smoking and to help fund healthcare
- Labelling on cigarette packets with information on addictiveness and health issues
- Programs to support individuals who wish to quit smoking and medical products that minimise addictive properties of cigarettes.



The relevant stakeholders should be considered and engaged from the outset of the business case where appropriate and be involved with defining the business need/opportunity.

Although some stakeholder engagement should occur at Step 1, detailed considerations for planning stakeholder engagement are contained in Step 5 and Step 22.

**Further information:**

- NSW Government Guide to Cost-Benefit Analysis (TPP17-03)
- Department of Industry - "Market failure guide: A guide to categorising market failures for government policy development and evaluation."

## **Step 2: Define the objective of planned intervention**

One of the most important elements of a business case is setting robust business case objectives that are outcomes focused and based on evidence. Business case objectives provide the basis for determining the success of the intervention and are a key element for the generation of options to address a need, challenge or opportunity.

The business case objectives should:

- clearly reflect the reason for change
- be outcome focused rather than focused on the potential solution, ensuring that where possible, outcomes are presented from a customer's perspective
- be well defined to ensure the identification of relevant options
- consider the risks arising from intervention.

The development of the objectives should be an iterative process which involves a reasonable degree of stakeholder engagement and evidence screening, particularly for larger/complex projects.

Objectives must be revisited, refined and reconfirmed regularly to ensure that they remain relevant and appropriate.

It is also important that where a proposed investment has multiple objectives, these are appropriately documented. A possible differentiation between primary and secondary objectives may be useful in prioritising objectives.

The level of risk identified when developing the business case objectives, identifying benefits (step 4), addressing programs (step 4) and considering strategic options (Step 6) will influence the length and depth required for the business case.

Refer to Step 4 for an example of linking business case objectives to State Outcomes and the corresponding links to benefits, programs and program KPIs.



## Tools and Resources:

### Setting Objectives

The following questions might be used as a guide to setting appropriate objectives:

- What are we trying to achieve? Do the objectives reflect that? What would constitute a successful achievement of the objective?
- Have similar objectives been set in other contexts that could be adapted?
- Are the objectives user or customer focused?
- Are the objectives defined to reflect benefits (e.g. improved health, crime reduction or enhanced sustainable economic growth in evidence based measurable format) rather than in terms of outputs (e.g. operations, prosecutions or job placements)?
- Can progress toward meeting the objectives be monitored and measured based on evidence?
- What targets can be set?
- What constraints may limit the realisation of the objectives?
- Are there any interdependencies with other initiatives that might have an impact on the objective of the interventions?
- What are the key risks that may impact the achievability of objectives?

Do the objectives relate to addressing:

- **Improved effectiveness** (e.g. improving the quality of services, improving access or better targeting these services to meet demand)
- **Improved efficiency** (e.g. improving the relationship between the quantity of inputs employed and the quantity, quality and timeliness of services delivered)
- **Reduced costs** (e.g. reducing the underlying costs of the inputs employed to deliver existing services)
- **Meet statutory, regulatory or organisational requirements** (e.g. complying with new or changing legislative requirements (or organisational policies))
- **Re-procurement of services or alleviation of service failure** (e.g. at the end of an existing contract or where an enabling asset is no longer fit for purpose).



### **Step 3: Define strategic context/ intention and explain how this business case will contribute to relevant government priorities and outcomes (qualitatively and quantitatively)**

This step constitutes an initial assessment of how the proposed change and business case objectives defined in Step 2 fit with overarching macro and micro (organisational) policies, strategies and programs.

This section should demonstrate the **strategic alignment** of the proposal and business case objectives with agreed priorities and overarching strategies including:

- State Outcomes
- Premier's Priorities and State Priorities
- strategic planning documents
- State Plans
- other Government strategies, such as long-term sector based infrastructure strategies reflected in the State Infrastructure Strategy (SIS) 2018-2038
- the recurrent assurance process
- other relevant government priorities, regulatory and legislative requirements and policies
- other projects or programs planned or underway (alignment with public sector priorities and strategy).

Refer to Appendix 3 for further information on State Outcomes and outcome budgeting. Refer to Step 4 for an example of linking business case objectives to State Outcomes and the corresponding links to benefits, programs and program KPIs.

### **Step 4: Understand benefits and risks from the intervention (change) and how these link to Programs and contribute to Program KPIs**

**Benefits** are the advantages gained by undertaking an intervention (e.g. investment or regulation) and are used to measure whether the business case objectives defined in Step 2 have been achieved. For example, increasing efficiency, effectiveness, quality, sustainability and/ or equity. Benefits must be real in nature, attainable, consider sustainability, derive directly through the proposed intervention and be supported by evidence.

Agencies should identify the key benefits (qualitative and quantitative) of addressing the need identified in Step 1 and meeting the business case objectives identified in Step 2. This includes considering:

- How do the benefits link to Programs and Program KPIs? (Example 1 below)
- Why these benefits are important to government and to other stakeholders?
- Whether the benefits are supported by existing evidence obtained from post evaluation of similar interventions and/or existing literature? (Refer to Appendix 5 for an example)
- What types of project KPIs are appropriate to measure the impact of interventions on these benefits?
- What are the key interdependencies that might influence benefit delivery through the interventions proposed?



### Example showing completion of Step 3 and Step 4 of a business case

Step 3				
#	Business case objective	Relevant State Outcome/s	Relevant State Outcome indicator/s	Other Government priorities, regulations or policies
1	Equity - Increase the number of children accessing early childhood education	Best start in life for young children	Increase the proportion of children enrolled in early childhood education program in the year before school	N/A
2	Effectiveness - Reduce the number of people in NSW suffering from smoking related health issues by 5 per cent by 2020 from 2018 levels.	Healthy, resilient communities.	There is no relevant Outcome Indicator for smoking. (A suitable indicator should be identified at the program level in Step 4.)	N/A

Step 4				
#	Business case objective	Business Case Benefit	Relevant Program	Relevant Program KPI
1	Equity - Increase the number of children accessing early childhood education	Everyone can access education (equity)	Support access to early childhood education	Number of licensed early childhood education services in NSW Further equity indicators e.g. access for Aboriginal and disadvantaged children
2	Effectiveness - Reduce the number of people in NSW suffering from smoking related health issues by 5 per cent by 2020 from 2018 levels.	Reduction in number of people experiencing smoking related health issues	Preventative health	There is no relevant Program KPI in the framework. (A suitable Program KPI should be identified.)

If there is no relevant State Outcome indicator within the Outcome Budgeting framework, an appropriate indicator should be developed at the program level.

**Risks** that can impact the delivery of the identified benefits and how these risks may be mitigated should also be identified early in the problem definition phase. The agency's enterprise risk management specialist should be engaged from this step onwards, on all risk related activities and their impact on substantial elements of the business case.



## Step 5: Identify relevant stakeholders

Early in the process you should identify the **key stakeholders** likely to be impacted by the change. They can contribute actively to the development of the investment proposal by providing their expert opinions, research and evidence. Stakeholders can be classified based on their power and interest in shaping a successful case for change. The Figure in Appendix 6 shows the approach to engagement with stakeholders based on a consideration of the two dimensions of stakeholder influence and impact at varying degrees.

Stakeholders should include appropriate representatives from the agency developing the investment proposal, other agencies impacted by the proposal, users, recipients or customers of the proposed service, and central agencies such as Treasury, Department of Premier and Cabinet and Infrastructure NSW.

Engaging early with key stakeholders can provide valuable inputs in developing the business case. However, stakeholder engagement should be planned carefully as there will often be reasons to engage certain stakeholders only later in the process. For example, to maintain confidentiality or to avoid creating expectations before the project is adequately committed to.

This step or section of the business case should:

- identify key stakeholders at the start of the proposal planning process and the likely impact of the change on each
- identify how stakeholders should be involved while developing the proposal
- include a high-level stakeholder consultation plan
- incorporate initial evidence of key stakeholder support for the proposal
- identify risks, including:
  - risks associated with involving (or not involving) certain stakeholders in the development of the proposal (i.e. considering if it is appropriate to contact external stakeholders)
  - risks to stakeholders deriving from the implementation of the proposal.

## Step 6: Investigate potential strategic responses and interventions to address the problem

The potential strategic response is a high-level approach to addressing the problem/ market failure. For instance, in the examples above, strategic responses might be: fund free childcare places; and fund a health education program, respectively. Step 6 will focus on the needs of the customers and consider:

- a **range of alternative approaches (including non-capital)** to achieve the business case objectives and benefits identified in Steps 2 and 4. The approaches should:
  - take into consideration the risks of government intervention, to delivery and to stakeholders
  - include new or revised service provision, regulatory changes, considerations of subsidies and funding arrangements
  - present an opportunity for the government to be innovative and customer centric in its approach to tackling major drivers that have triggered the service need, e.g. changing the demand curve, improving productivity or addressing the supply side.
- **Evidence to support the costs and benefits** of the potential strategic response and its impact on the business case objective. Gathering the right evidence in Stage 0 is key in informing the development of the long list of options compiled in Stage 1. Contact your Cost Benefit Analysis analyst at Treasury for further information.



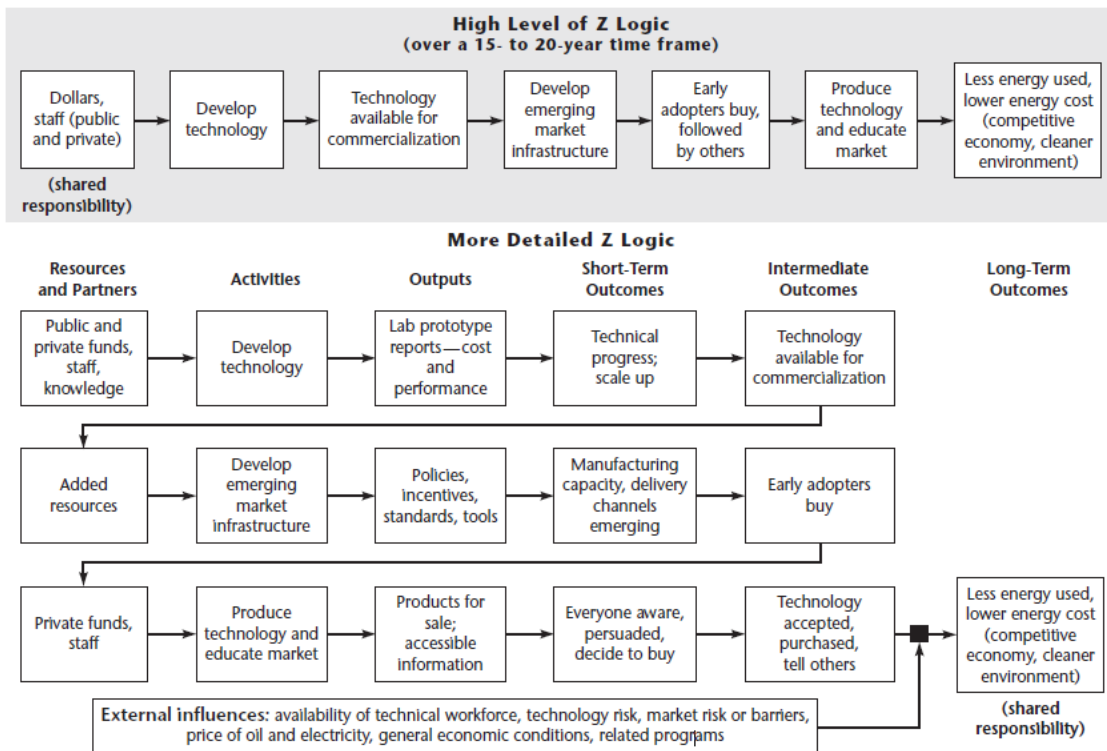
The business case should include: a program logic that articulates the causal pathway between the identified need or issue that a program is seeking to address; its intended activities and processes; their outputs; and the intended program outcomes. Refer to the example logic map following.

**Tools and Resources:**

- NSW Government Commissioning and Contestability Practice Guide provides a useful framework for identifying and evaluating potential strategic responses.

**Example logic map:**

A Z logic model for a research and technology development organisation, at two levels of detail.



Source: Wholey, J S, Hatry H P and Newcomer, K E, *Handbook of Practical Program Evaluation (3<sup>rd</sup> Edn)*, Jossey-Bass, San Francisco, CA, 2010.



## **Step 7: Provide high level cost estimates for the intervention (strategic responses) identified**

This step provides a high-level costing for the strategic responses identified in Activity 6, if available. A brief description should be included, outlining the basis of the estimate, its accuracy and any key cost assumptions for each strategic response (e.g. use a range rather than a single dollar value or otherwise).

A preliminary Financial Impact Statement (FIS) should also be prepared. The purpose of the FIS is to estimate the impact of strategic responses on the State Budget and agency financial statements. Refer to Step 12 for further details on a FIS.

In Stages 1 and 2, as outlined in the sections following, costs will be further defined and estimated for specific options generated later in the process.

### **Next steps**

Refer to your Treasury analyst and the Business Case Treasury Circular for guidance on whether to progress to the next Stage in the guidelines.



## 5. Stage 1 - Strategic Business Case

The strategic business case should build upon the work undertaken in the Problem Definition Stage.

### 5.1 Purpose of the Strategic Business Case Stage

The **Strategic Business Case** follows the Problem Definition Stage. It provides decision makers with an indication of whether there are beneficial options to address the objectives that are worthy of further investigation.

The Strategic Business Case is the primary document for a **Gate 1 review (under the NSW Gateway Policy)**.

The purpose of the Strategic Business Case is to:

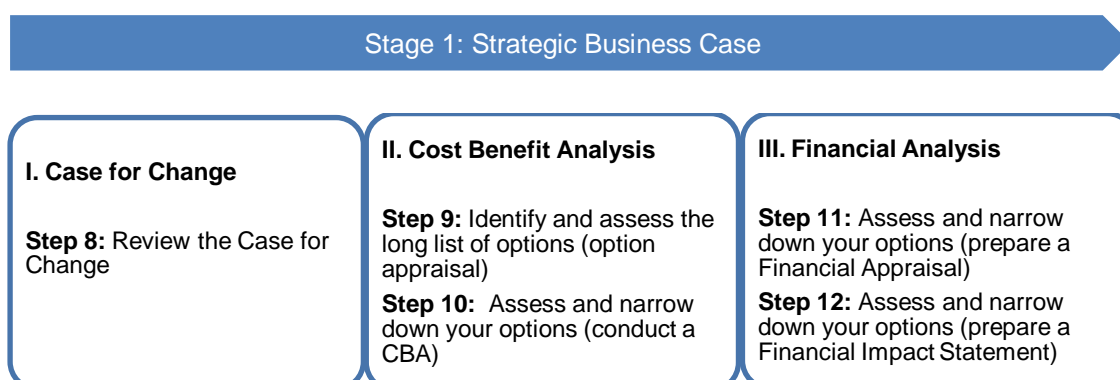
- reconfirm the need for government intervention and the case for change outlined in the Problem Definition Stage
- consider the value for money and feasibility of a full range of options and based on that reduce the number of options to a shortlist
- seek the approval of decision-makers to proceed with the development of a Detailed Business Case.

The evidence expected at this stage is preliminary by nature, and the level of detail and accuracy will increase over time as the proposal develops. The size and extent of the Strategic Business Case should reflect the scale, complexity and risk of the proposal.

The Strategic Business Case is the foundation for the development of a **detailed business case** and can be used to seek support for a trial or pilot proposal. Lessons learnt and evidence gathered through the trial or pilot process can then be used to develop a larger scale change proposal through a Detailed Business Case.

### 5.2 Relevant steps

**Figure 5.2.1: Overview of steps in the Strategic Business Case Stage**



Refer to Appendix 1 for an overview of the full business case process and steps. Refer to the Business Case templates accessible on the Treasury website for guidance on preparing a Strategic Business Case.

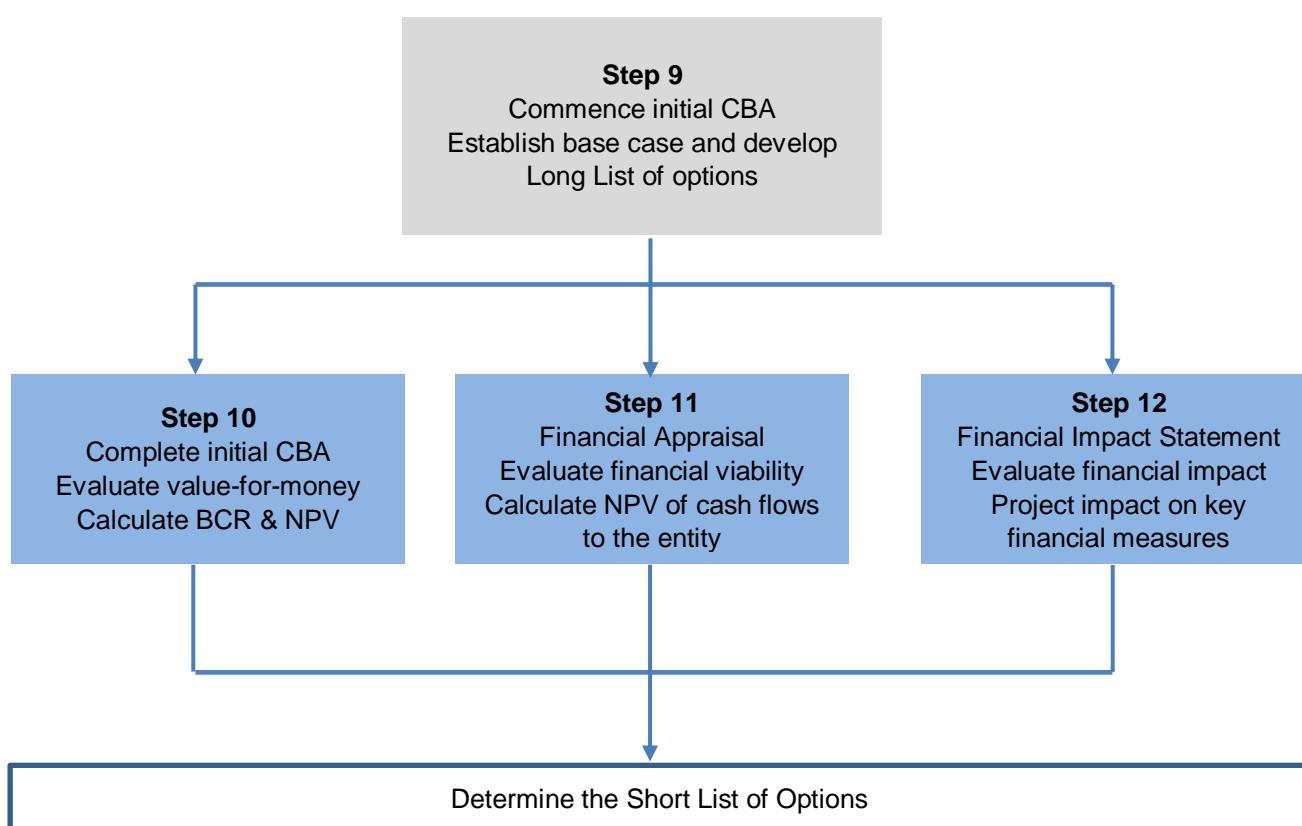
## 5.2.1 The Case for Change

### Step 8: Review the Case for Change – Problem Definition

The purpose of this step is to review the Case for Change by validating and updating the information assembled during the Problem Definition Stage. This step should cater for any significant changes in the political, social, economic and organisational environment that might have an impact on problem definition, desired objectives, government priorities and stakeholders' landscape. Supporting evidence should be provided.

#### Long-List to Short-List

The next four steps each play a role in developing a Long List of options and deciding how to narrow the Long List to a Short List of options.



A Long List of options is developed in **Steps 9** using the initial steps of a Cost Benefit Analysis (CBA) including establishing the base case and developing a range of options that have the potential to meet the business case objectives.

Once the Long List of options is developed, the following three types of analysis are performed to narrow down the options to a Short List:

- **Step 10:** Cost Benefit Analysis (CBA) is completed to assess whether the benefits of a proposal are likely to exceed the costs, and which option among a range of options will result in the highest net social benefit
- **Step 11:** Financial Appraisal (FAP) is performed to assess whether the project's cash flows will generate sufficient revenue to meet its financial obligations and the direct financial impacts on the entity



- **Step 12:** Financial Impact Statement (FIS) will provide a view of how each option will impact key financial measures including the entity's budget.

A Short List of options will be selected based on the above analysis. These steps are explained in further detail below.

### 5.2.2 Cost Benefit Analysis

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Cost-Benefit Analysis (CBA) is an appraisal and evaluation technique that estimates the economic, social and environmental costs and benefits of a project or program in monetary terms. The main purpose of a CBA at the Strategic Business Case Stage is to support a systematic options analysis. The results from the CBA will support moving from a long list of options to a short list of options (in the Strategic Business Case). The short list of options will then be assessed in more detail and accuracy at the Detailed Business Case Stage, when a preferred option is usually selected. The CBA:

- estimates costs, benefits and risks associated with each option, to validate value for money and solution viability
- is likely to be a preliminary assessment at the Strategic Business Case Stage (CBA on the Long List of options) that reflects the preliminary nature of information generally available at this stage.

The *NSW Government Guide to Cost-Benefit Analysis* (TPP17-03) provides guidance on the nine steps of CBA.

Key outputs of a CBA, that are used to evaluate options are:

**Benefit/Cost Ratio (BCR):** The ratio of the present value of total benefits to the present value of total costs.

**Net Present Value (NPV):** The difference between the present value of benefits and the present value of costs.

The following steps are recommended when undertaking a CBA as part of the strategic business case:

#### Step 9: Creating your options – Develop and refine the long list of options

The first two steps of CBA are to state the objectives and then define the base case and develop options. The range of options in a business case is derived by the nature and magnitude of the objectives. For a major project, a wide range of options should be considered, each of which needs to be compared to a base case. Options should be customer focused and designed around the needs of the user and/or customer. This section explains how options are created, valued, adjusted for future uncertainty (using sensitivity analysis) and how non-monetised impacts are considered. Further guidance on the development of options can be found in *NSW Government Guide to Cost –Benefit Analysis* (TPP17-03).



### Establish the base case

A CBA compares the state of the world with the proposal against the state of the world without the proposal. Creating a list of options involves identifying the range of activities possible and available to Government to achieve the identified objectives. The list of options is compared to a base case. The base case shows the state of the world without the project, usually represented by a “business as usual” (i.e. the current policy environment including continuation of current quality and quantity of service such as planned maintenance and usage). In other cases, the base case might entail “do minimum” level of government involvement to meet requirements. In some cases, the base case may be defined as “do nothing” or “spend nothing”. Examples could include, letting an existing contract lapse, or letting a regulation lapse, as most have sunset clauses.

The definition of the base case requires special attention because the costs and benefits of all other options, are compared with the base case. If no options present a greater welfare improvement than the base case, the base case might be the preferred option where the government chooses to maintain current quantity and quality of service, “do minimum”, or “do nothing”. Additional guidance on establishing the base case can be found in TPP17-03 *NSW Guide to Cost-benefit Analysis*.

Once the base case has been defined, a Long List of options should be developed.

### Long list of options

The long list of options is a range of feasible solutions with the potential to meet the investment objectives and deliver the expected State Outcomes and benefits of the proposal (**the Long List**). These options should be diverse and include optimally capital, recurrent programs, regulatory change, different policy settings and reforms.

The following components could be considered when developing the long list of options:

- **Demand-side measures** – could existing services be rationed better using pricing or eligibility criteria?
- **Supply-side measures** – e.g. would better training or changes to operating guidelines be effective?
- **Alternative policy interventions** – what forms of government intervention would best achieve the objectives? For example, consider provision of information, regulation, tax concession or subsidy, contracting private providers, or government provision.
- **Variations in scale or scope** – could the operation be smaller, combined with other programs, provide a different quality of service, use different materials, have a different design life, entail a different method of procurement or have alternative locations (site selection)?
- **Alternative time paths** – could the operation be deferred or undertaken in discrete stages? Delaying or bringing forward a project could alter the benefits and costs to the community. Alternative time paths could have different scope and delivery risks.
- **Interdependencies** with other initiatives and **limitations** that might impact the options generated.

In developing options, consideration should be given to the potential for commissioning and contestability, public private partnerships, value sharing and innovation.

**Table: Summary of aspects to consider in the option generation process**

<p><b>Commissioning and Contestability</b></p>	<p>Government agencies are expected to consider commissioning and contestability in the context of service delivery improvement, and provide the Cabinet and Expenditure Review Committee (ERC) with confidence that all service delivery policy and funding proposals have been developed in line with the NSW Government <i>Commissioning and Contestability Policy</i>.</p> <p>Options for service responses should demonstrate application of the following principles:</p> <ul style="list-style-type: none"> <li>▪ Commissioning of services should focus on improving State Outcomes and delivering quality services, regardless of organisational boundaries and constraints</li> <li>▪ Government must act in the interest of customers and the community by putting them at the centre, with greater attention to the integration of services and an improved end-user experience</li> <li>▪ Productivity, quality and efficiency benefits should be shared with the customer through service improvements as well as being reinvested in Government priorities</li> <li>▪ Effective commissioning will clearly define and prudently manage delivery and financial risk</li> <li>▪ Agencies should consider their role as policy-maker, commissioner, regulator and provider and whether a separation of roles would be of benefit within the service design.</li> <li>▪ Commissioning will encourage innovation and openness to more diverse service delivery models in the public, private and not-for-profit sectors. These models should be flexible, reflect the needs of the customer and recognise the limitations of certain markets</li> <li>▪ Contestability allows government to challenge existing providers to deliver service outcomes within agreed resources.</li> </ul>
<p><b>Value Sharing</b></p>	<p>Several possible mechanisms can potentially provide funding for infrastructure, ranging from taxes and levies to various forms of beneficiary pays mechanisms (e.g. cost recovery, user charging, value sharing).</p> <p>When new or upgraded infrastructure is built, many of the benefits generated by that infrastructure are effectively monetised through increases in local land values in or around the areas affected by the infrastructure, reflecting the market's 'willingness to pay' for those benefits. Value-sharing is a funding mechanism that attempts to quantify and use part of the economic uplift created by new or upgraded infrastructure to help fund that infrastructure. Value sharing differs from cost recovery and user charging because in the latter two mechanisms, the payment by any one beneficiary is based on recovery of the costs of providing the infrastructure, which at the margin aligns to the private benefit enjoyed by that beneficiary. However, with value capture the payment by beneficiaries is not based on the cost of delivering the infrastructure but on benefits derived from the infrastructure.</p>



<b>Innovation and Digital</b>	NSW <i>Innovation Policy</i> and <i>NSW Digital Government Strategy</i> applies to all agencies. The business case process can assist agencies to develop new ways of working by supporting trials or pilot proposals. Smaller proposals can be a way to establish an evidence base that a new way of working is effective before larger scale changes are made. Business cases should also leverage digital technology to deliver smart, simple and seamless services and more effective regulation. (see <i>NSW Innovation Policy</i> and <i>NSW Digital Government Strategy</i> )
<b>Potential Public Private Partnership (PPP) projects</b>	Public infrastructure projects with a total estimated capital value exceeding \$100 million, must be assessed for possible PPP procurement to ensure value for money (see <i>NSW Public Private Partnerships Guidelines</i> ). Contact NSW Treasury as early as possible in the business case development process to discuss the necessary requirements.

Appendix 7 includes further tools that might support the generation options.

In some cases, particularly in large, complex and risky proposals, option identification and appraisal will be an iterative process as more information comes to light or as agency and government priorities change.

**Further information:**

- NSW Government Guide to Cost-Benefit Analysis (TPP17-03)
- NSW Public Private Partnerships Guidelines (2017- Preparation, Procurement and Contract Management) (TPP17-07)
- NSW Government Commissioning and Contestability Policy (TPP16-05)
- Appendix 7: Option generation tools.



## Step 10: Assessing and narrowing down your options (conduct a CBA for Stage 1)

When the Long List of options has been generated, a further assessment is undertaken to determine how well the options meet the investment objectives and provide value for money. The remaining steps of CBA (refer to TPP17-03) outline the process for conducting this assessment.

CBA is used to assess the options that could meet the identified objectives and identify the best solutions for the community (short list of options). CBA captures all benefits and costs (including those that may not be reflected in market transactions). CBA also indicates **which groups (in society) bear costs or receive benefits** (distributional considerations). This type of analysis enhances the understanding of the fairness of a specific option compared to other solutions, their social impact and scale.

Refining or narrowing the number of options to a **Short-List** has practical advantages in terms of reducing complexity. However, there is also a risk of excluding the optimal solution prior to completing the full analysis. Therefore, it is recommended adequate documentation is retained in the business case (e.g. as an appendix) to justify why specific options have been excluded.

### Example: Identifying who gains and who loses as part of the CBA

Consider the example above on meeting an energy saving target for NSW. A list of those who might be impacted by the intervention could include:

- **Households** – Lower energy bills (in the home, during a commute) from more efficient appliances
- **Businesses** – Energy intensive Industries become more competitive by lowering their energy costs, but may have to invest in new technologies
- **Government** – Reduced service delivery costs
- **Broader community** – Health benefits through goods and services that burn less fossil fuels and emit less air pollution
- **The Environment** – Reduced emissions from power generation that impact air, soil and water quality.

Some of these impacts might be easier to quantify than others e.g. health benefits through less air pollution. It is important to consider all types of impacts as part of the CBA Report.

***Overall, a CBA reports whether the benefits of a proposal are likely to exceed the costs, and which option among a range of options will result in the highest net social benefit.***

Types of CBA include:

**Stage 1 CBA applied to a Long List of options (Strategic Business Case)** which includes the same steps and principles as the full CBA but may be conducted using preliminary information on costs, benefits and risks.

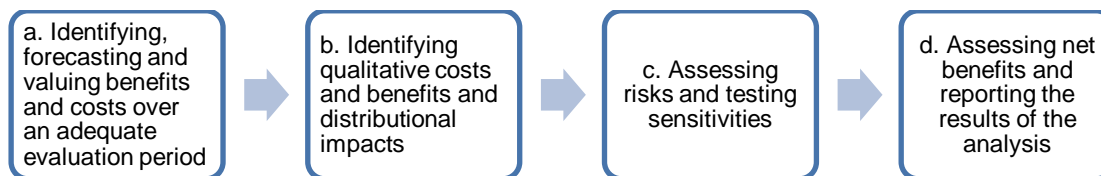
**Stage 2 CBA applied to a Short List of options (Detailed Business Case)** which assesses in detail the economic, social and environmental costs and benefits of the short list of options identified in the Strategic Business Case.

Refer to Appendix 8 for an overview of the difference between a Stage 1 and Stage 2 CBA.





In any type of CBA, the key milestones include:



For further guidance on the CBA process and implementing CBA techniques for inclusion in a business case, agencies should refer to *NSW Government Guide to Cost – Benefit Analysis* (TPP17-03). The steps below are a summary of a CBA.

**a) Identifying, forecasting and valuing benefits and costs over an appropriate evaluation period**

An estimate of costs and benefits for each option identified should include:

- **Direct costs and benefits** imposed on government from planned expenditure
- **Positive and negative externalities** to third parties not directly involved in consumption or production
- **Costs and benefits realised in related markets** (i.e. complement or substitute markets).

**Evaluation period:**

Benefits and costs should cover the whole life of the project or program and a period over which the costs and associated benefits can be measured including **capital expenditure** (e.g. roads and bridges), **recurrent expenditure** (e.g. running schools or hospitals), **externalities** (e.g. pollution, knowledge spill overs), and **regulation** (e.g. environmental and sanitary regulation).

**b) Identifying qualitative factors and distributional impacts**

**Qualitative costs and benefits:**

While quantifiable costs and benefits are the key components of a CBA, qualitative costs and benefits should also be included. There are cases where a quantification may not be practical or even possible. A list of qualitative factors is part of a CBA and informs decision makers regarding e.g. the direction of impact and likely significance of a specific option. This list should include consideration of risks of natural hazards and human-related threats and whether options are resilient against these threats. These factors should be presented without subjective weighting.

**Distributional impacts:**

Proposals will often have different impacts for different sections of the community. This should include a summary of the distributional impacts and potential transfers between different groups. The success of some reforms can depend on having a robust understanding of the distributional gains and losses and adequate strategies to address these.

**c) Assessing risks and testing sensitivities**

The purpose of sensitivity testing is to assess the robustness of the proposal to movements (up/down or positive/negative) in the variables that determine its viability, such as demand or population growth forecasts or costings. **Sensitivity testing should be informed by the key risks identified and how uncertainties about the costs and benefits may affect the NPV and BCR.** This should include identifying key dependencies between different elements of an initiative to help construct realistic upside and downside scenarios.





#### d) Assessing net benefits and reporting the results of the analysis

The aim of the CBA is to summarise the full impacts of a range of project or policy options. To achieve this, costs and benefits for all segments of NSW (i.e. consumers, businesses, government) are aggregated into an overall measure of net social benefit.

**To allow for costs and benefits occurring at different times, CBA uses the concept of present value – where future costs and benefits are discounted to reflect their value in the present.**

Discounting reflects the view that a dollar received in the future is worth less than a dollar today. Present values allow for decisions to be made in the present about initiatives that have costs and benefits in the future.

At a minimum, the following measures should be calculated for each option in the CBA:

- **Net Present Value (NPV)** – The difference between the present value of benefits and the present value of costs.
- **Benefit Cost Ratio (BCR)** – The ratio of the present value of total benefits to the present value of total costs.

The central value of these two measures, as well as their ranges based on key sensitivities, should be reported as part of a clear and concise summary of **the base case, options assessed and the main results of the sensitivity tests**. The summary should focus on major differences between the options.

All **critical assumptions** should be made explicit and be supported by evidence. This includes transparency of the key drivers, inputs, risks and assumptions used in constructing the base case and the options considered. Examples of key assumptions include demand growth and its components (e.g. population growth, any changes in usage of the service).

**Results:** A  $NPV > 0$  and a  $BCR > 1$  implies that a proposal could be viable, but this is not a sufficient condition to accept a proposal. The results attained from the CBA should be benchmarked against other similar projects in the past and other options. Furthermore, there could be a risk that the project does not provide a net benefit to the people of NSW, particularly if the BCR is closer to 1. The BCR is based on the best estimate of what is thought to be the effect of project, but there will be risks associated with the estimates. The benefit eventually attained may be less than forecasted. Therefore, sensitivity testing is important. It provides a more robust appraisal of a proposal, taking into consideration the possibility of a worst-case scenario.

#### Stage 1 CBA applied to a Long List of options

**CBA** is used to assess the full set of options and narrow it down to a short-list that will undergo further assessment in the detailed business case. **Stage 1 CBA (as part of the strategic business case):**

- Is one of the tools to shortlist the identified options in a systematic, evidence based and streamlined fashion by progressing the options with the highest BCR and NPV for further analysis in the Detailed Business Case. Where the options rank differently between the BCR and NPV, the BCR is the preferred approach where a budget constraint exists. However, where a budget constraint exists but some proposals are complementary, e.g. where benefits and costs of one proposal depend on whether another proposal is implemented, further analysis may be needed to rank proposals.
- Adopts the same principles as the Stage 2 CBA, but is based on the preliminary evidence available at Stage 1 of the business case. For example, this could include tools that use standard parameters for estimating benefits and costs. The risks associated with using standard parameters, rather than project specific parameters, should be stated and tested.

### Example: CBA on the Long List of options undertaken in Stage 1 - Strategic Business Case

**Stated objective:** Improve health outcomes through meeting a service delivery need for renal dialysis health services in a Local Health District (LHD).

**Base case:** No change to health services in NSW – business as usual. Current service delivery continues.

**Available information:**

- Modelling based on demographic projections has been used to generate an early estimate of potential health service needs (i.e. health service demand) in a LHD
- Costings have been estimated based on early planning of a variety of health infrastructure options, as well as for non-infrastructure options such as preventative health programs and potential regulatory solutions
- Clinical information is available for the effect that different options can have on health outcomes and the value of health outcomes.

**Benefits:** The modelling of health service needs are available (based on demographic projections) and can be combined with clinical information on health outcomes and values to estimate health benefits. This initial modelling will be refined in the Stage 2 CBA as the scope and definition of different options becomes clearer and as demographic projections are refined.

**Costs:** Costs have been estimated based on infrastructure costs for capital options and costings based on the early design of different preventative health programs and regulatory options. These costs will be refined in the Stage 2 CBA when detailed costings have been estimated using further information such as detailed site plans, program operation models, regulatory impact assessments and so on.

The table below illustrates how the options are compared to the base case and incremental results are presented.

	Present value of benefits	Present value of costs	NPV	BCR
<b>Base case:</b> No change	\$0	\$0	0	0
<b>Option 1:</b> New renal dialysis hospital wing	\$90 million	-\$60 million	\$30 million	1.5
<b>Option 2:</b> Regulatory option	\$15 million	-\$30 million	- \$15 million	0.5
...	...	...	...	...
<b>Option 20:</b> Preventative health program	\$40 million	-\$20 million	\$20 million	2.0

**Results:** If there is agreement to proceed to Stage 2, the Long List of options can be reduced to a few viable projects that will be analysed in greater detail in a full CBA (next Stage: Detailed Business Case). In this example, the results suggest that Option 1 and Option 20 are worthy of further consideration in the Stage 2 CBA since both have positive NPVs and BCRs greater than 1. Since Option 2 has a negative NPV and BCR less than 1, it should not be considered in the Stage 2 CBA. The Stage 2 CBA will go on to assess viable options in a greater level of detail to help inform the preferred option(s) necessary to achieve the objective based on the NPV and BCR of options assessed.

#### Further information

- NSW Government Guide to Cost Benefit Analysis (TPP 17-03).



### 5.2.3 Financial Analysis

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Financial analysis looks at the impact of a proposed project on the finances of the government entity undertaking the project or policy. In Stage 1, this involves preparation of two high-level assessments:

- financial appraisal (FAP)
- financial impact statement (FIS).

The high-level approach in Stage 1 relies on existing or standard parameters for quantifying inputs so that a long list of options can be assessed in a timely manner. Both should be completed in more detail in Stage 2.

At both Stages the scope and effort involved in a financial appraisal should be commensurate with the size and risk of the proposed project. Although applications of financial formulae are generally part of an appraisal, qualitative considerations and sound business judgement are also integral.

#### Step 11: Assessing and narrowing down your options (prepare a Financial Appraisal)

##### Financial Appraisal

The financial appraisal (FAP) is an important aspect of the business case and is necessary to provide decision makers with sufficient evidence to make informed decisions and to understand the financial and Budget impacts on the entity.

The FAP is a method of evaluating the financial viability of the proposed project. It uses the Net Present Value (NPV) of a project's cash flows to assess the extent to which the project will generate revenues to meet its financial obligations. All revenues and expenditures incurred must be considered.

In summary, a FAP considers:

- project cash flows
- sensitivity of all financial projections to key project risks
- the estimated cost of investment
- financial impacts of alternative projects.

Its purpose is to assist decision makers to assess options that will best deliver the objectives given whole-of-State budget considerations and the overall fiscal context.

FAPs are required for:

- capital projects proposed by government businesses
- all projects proposed by General Government agencies that involve a financing decision (including outsourcing and public/private partnerships)
- other types of projects as requested by NSW Treasury.

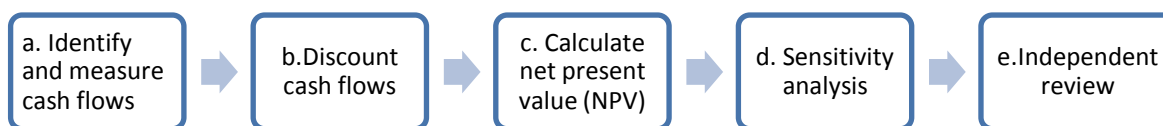
FAPs should be reviewed by senior management and, in the case of government businesses, by the Board.

A FAP is generally undertaken by government entities involved in a commercial project proposal. These commercial proposals may involve asset construction, purchase, lease or sale and may be financed in a wide variety of means through grants, borrowings, revenues, supplier finance or a combination of these mechanisms.



FAPs, however, are useful for all types of projects including government proposals that do not generate significant revenue streams, to understand the direct financial impacts on the entity. This form of analysis provides a different perspective than CBA as explained below and in Appendix 2.

**The key steps in preparing a financial appraisal are:**



#### **a. Identifying and measuring the cash flows**

Project incremental costs, revenues, risks and best alternatives should be identified and initially measured as nominal cash flows in the period they occur. Typical cash flows and more information are summarised in Appendix 2.

Cash flows should be estimated on a before and after-tax basis over a project's economic life. However, financial impacts should be excluded if they would have occurred regardless of whether the project was implemented. Additional information on financial impacts that should be excluded from a FAP is provided at Appendix 2.

For assets that have an economic life beyond the term of the financial analysis, the appraisal term can be restricted to 20 years. An estimate of the asset's residual value at the end of year 20 should be included in the appraisal to represent the asset's remaining service potential. However, it is not mandatory for FAPs to be limited to 20 years.

The approach used to estimate residual (or terminal) asset values should be clearly specified. Special care needs to be taken to ensure this calculation accurately values assets at the end of the appraisal term.

Periodic cash flows should be estimated using increments no longer than one year. However, the periods chosen should be of the most practical relevance to the analysis (such as six-monthly, quarterly or monthly). Shorter periods might be adopted where the overall project life is relatively short.

All assumptions made and sources of data for cash flows should be provided and as far as possible, be based on empirical data.

#### **b. Discounting cash flows**

Net cash flows should be discounted at a discount rate reflective of the risk inherent in a project. For projects that involve cash flows subject to market risks (e.g. user charges, commodity prices, demand risks and changes in technology) these cash flows should be discounted at a rate reflective of the risks inherent in the project (e.g. an appropriate post-tax WACC). For some government projects which do not involve cash flows exposed to economic or market risks, this will generally be at or close to the risk-free rate.

Constructing the correct discount rate for specific projects can be complex and may require external advice. Agencies should contact NSW Treasury for advice as soon as possible in a project lifecycle where they anticipate such advice may be necessary.



This calculation of discounted cash flows enables the assessment and comparison of after tax cash flows.

The project cash flows should be discounted to the present day – that is, to the time the investment decision is being made - regardless of the actual starting date for the project. Calculations must recognise that capital expenditure costs are not necessarily incurred at the commencement of a project and are usually incurred over a period.

The discount rate can be thought of as a hurdle rate when applied to project assessments. It describes the expected financial market return that investors would require to supply capital for investment in a similar asset.

For more information see Appendix 2.

### **c. Calculating the net present value**

The Net Present Value (NPV) of a proposed project's net cash flows is an important measure of the financial assessment of a project. It is calculated by subtracting a project's cash outflows from its cash inflows for each relevant period (typically a year or a quarter) to arrive at a net cash flow for the period. Individual net cash flows for each period are then discounted to the present day and summed to arrive at the overall NPV. More information is provided in Appendix 2.

A project is potentially viable if total discounted revenues are greater than the discounted costs, which means that the NPV is greater than zero. A negative NPV implies that State capital contributions will likely be required (to achieve a zero NPV). Where multiple projects are being compared, and they are mutually exclusive, the project yielding the highest (positive) NPV indicates a preferred financial outcome.

If an entity has more proposed projects with positive NPVs than it can fund, then a separate ranking exercise of these projects is required. This may involve both qualitative and quantitative measures as deemed appropriate by the agency in consultation with Treasury. A common method is a profitability index which is calculated by dividing the NPV of post-initial cash flows by the initial investment amount.

### **d. Sensitivity analysis**

FAPs are based on a range of assumptions about a proposed project. The critical assumptions adopted for a FAP that are subject to uncertainty should be altered one at a time to test the sensitivity of financial projections. This allows changes in key variables to be examined as well as alternative views of the future. Sensitivity analysis allows best and worst-case scenarios to be specified. Break even points for critical assumptions – situations where the NPV of a proposed project becomes negative – can also be determined.

Risk categories which might be considered include:

- market risk
- completion risk (on time, on budget)
- operating risk
- financial risk
- environmental risk
- private sector partner risk (contractual obligations)
- political risks.



### e. Independent review

A FAP should be subjected to a structured internal, but independent, review. The reviewer should be satisfied with:

- project objectives, outputs, outcomes, benefits and scope
- range and feasibility of options considered
- completeness of the list of costs and their valuation
- adequacy of the sensitivity analysis and the impact on NPV
- risks faced by the project as well as the implications of such risks
- forecast project impacts and timing
- rate at which post tax cash flows have been discounted, and
- identification of the parties responsible for project implementation and for monitoring project execution and results.

Depending on the depth of in-house expertise and resources, it might be appropriate in some instances to engage the services of expert external advisers to conduct a review.

### FAP vs CBA

As discussed above, the role of the FAP is to evaluate the impact on the finances of the government entity undertaking the project. Whereas the role of the CBA is to evaluate the value for money more broadly, in addressing the investment objectives.

The building blocks of a CBA and a FAP have some common elements. For example, both the CBA and FAP rely on quantification of future streams of costs and benefits that are discounted to obtain NPVs.

However, a CBA and FAP differ in their scope, the bases for valuation of costs and benefits, and the discount rate used. A FAP calculates the net financial value (positive or negative) from a policy change or project by analysing the direct cash flows for government. Whereas, a CBA monetises the total economic impact across all stakeholders. Methodological and practical differences between a FAP and a CBA are outlined in Table 2, Appendix 2

### Further information:

NSW Public Private Partnerships Guidelines (TPP17-07), (2017 - Preparation, Procurement and Contract Management)

Refer to the Strategic Business Case Template for an example of a financial appraisal.

## Step 12: Assessing and narrowing down your options (prepare a Financial Impact Statement to define the impact of the proposal on costs and savings)

A Financial Impact Statement (FIS) should be prepared and submitted for all longlisted options requiring budget funding as part of the Strategic Business Case.

The **purpose** of the Financial Impact Statement is to provide a view of how each option will impact key financial measures in the future on both the entity's budget and the Whole of Government (WoG) budget. The FIS should include estimates of:

- expenditure required to meet the projected level of demand, while optimising efficiency
- revenue (if applicable) based on the approved forward budget
- capital expenditure
- funding sources, including appropriations
- impact on key financial metrics, including:



- net cost of service
- total financial impact
- labour expense cap and staffing
- Budget result
- net lending.

The FIS should also address projected budget growth, efficiency gains, revenue from compensable activity and other sources of income, and/or internal redistributions.

The Business Case Templates provide an example of a FIS which should be adapted to reflect the full life of the project.

The main differences between a FAP and a FIS are outlined in Table 3 of Appendix 2. However, put simply, the FAP evaluates the financial viability of an option by measuring the NPV of future cash flows. Whereas the FIS projects the impact of the option on the entity's and Government's key financial measures, including balance sheet and operating statement, on an accruals basis.

Where applicable, agencies must consult with other agencies to determine any sector wide financial impacts. For joint agency proposals, each agency should complete a separate Financial Impact Statement. The lead agency should then aggregate the financial impacts of all relevant agencies and adjust for any overall financial impacts at the whole-of-government level.

If a financial impact statement is not prepared in Stage 1, the justification for this should be detailed.

**Further information:**

- Refer to the Strategic Business Case Template for an example of a financial impact statement.

**Rationale for the short list of options:**

Following the Stage 1 cost benefit analysis (CBA) and financial analysis (FA), a short list of options should be selected based on indicators such as BCR and NPV from the CBA and NPV and Profitability Index from the FA. The shortlist of options should always include the base case.

Other factors for consideration when shortlisting proposed projects might include:

- achievability
- supplier capacity and capability
- reputational risks
- environmental impacts
- qualitative factors, including their importance and the reasons they could not be quantified
- how the options meet the objectives of the business case and contribute to State Outcomes.

Consideration should also be given to compiling an appendix outlining critical gaps and the steps that will be taken to address those gaps in Stage 2.

When assessing and shortlisting options, a negative net present value (NPV) does not necessarily mean an investment should not progress. For example, it might be appropriate for NSW government to invest in overcoming market failure, provide a social good or commission services without a revenue source being produced. In this situation, it is possible for a FAP to produce a negative NPV, while the CBA results show an economic benefit outweighing the cost (Benefit Cost Ratio in step 10).

**Next steps**

Refer to your Treasury analyst and the Business Case Treasury Circular for guidance on whether to progress to the next Stage in the guidelines.



## 6. Stage 2-Detailed Business Case

### 6.1 Purpose of the Detailed Business Case Stage

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**The Detailed Business Case** builds on the analysis of options undertaken as part of the *Strategic Business Case* and provides a more comprehensive analysis of the proposal. This stage includes a selection of the preferred option, which can be delivered while maximising social welfare and value for money, as well as affordability. In addition, the Detailed Business Case sets up the commercial and management arrangements for the successful procurement and delivery of the project.

A Detailed Business Case is commonly used for funding submissions to ERC as part of the Budget Process, and is the primary document for a **Gate 2 review under the NSW Gateway Policy**. Refer to the Business Case Treasury Circular for guidance on when a detailed business case must be prepared.

The Detailed Business Case should:

- Revisit and confirm the case for change developed as part of the Problem Definition and Strategic Business Case
- Identify the preferred option, which maximises social welfare and optimises value for money, by undertaking a more detailed, evidence based analysis of the costs, benefits and risks of the options shortlisted in the strategic business case
- Identify potential sources of funding and undertake a financial appraisal for the shortlisted options
- Plan the necessary steps for the successful procurement and delivery of the project.

As with the Problem Definition and the Strategic Business Case, the extent of the Detailed Business Case should be informed by the size, scope, risk and complexity of the investment proposal.

### 6.2 Relevant steps

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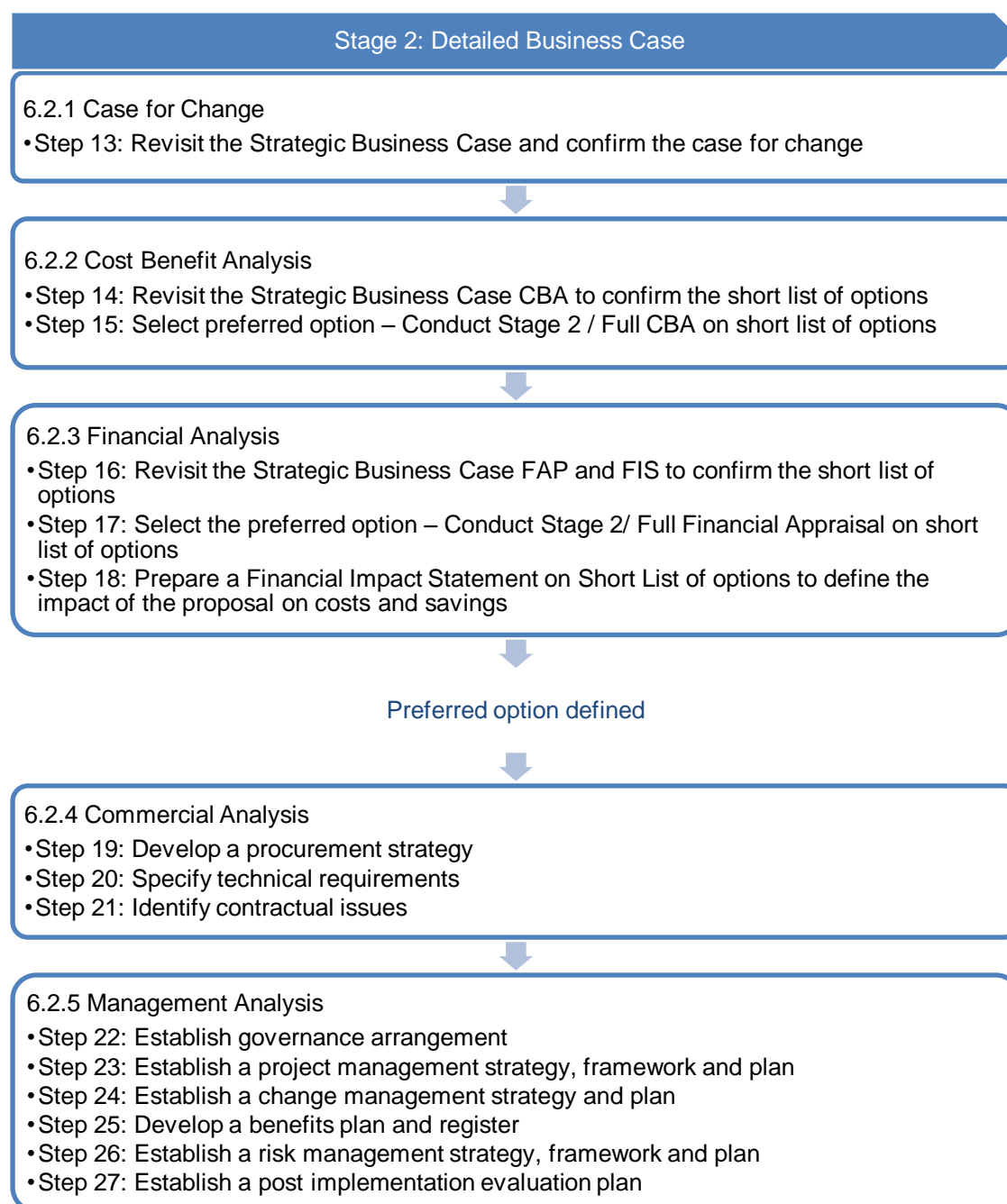
The Detailed Business Case should contain all dimensions of analysis involved in developing a business case including case for change, economic, financial, commercial, and management analyses.

Figure 6.2.1 below outlines the recommended steps when undertaking the Detailed Business Case.



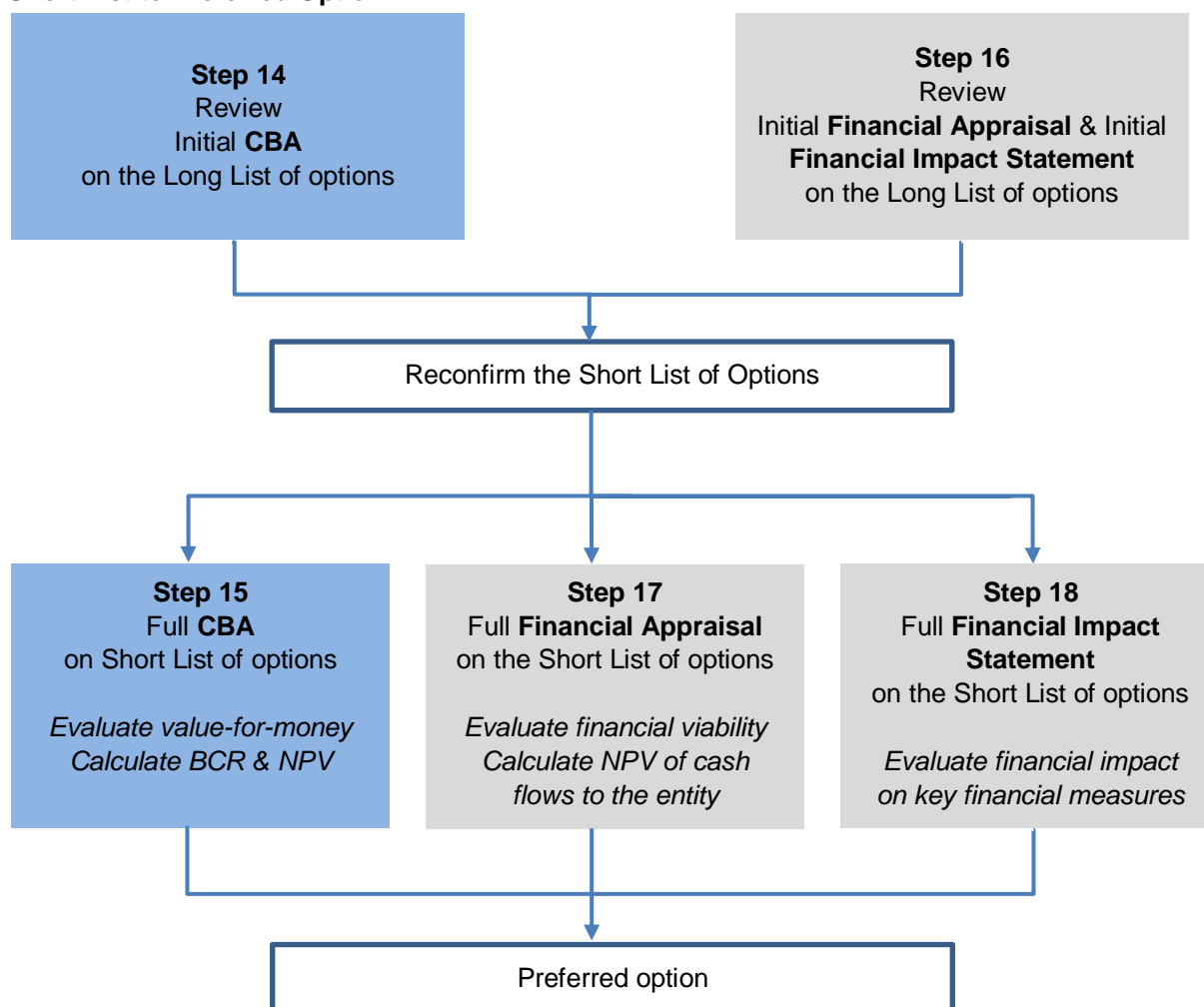


**Figure 6.2.1: Overview of steps in the Detailed Business Case Stage**



Refer to Appendix 1 for an overview of the full business case process and steps. Refer to the Business Case Templates accessible on the Treasury website for guidance on preparing a Detailed Business Case.

### Short List to Preferred Option



## 6.2.1 The Case for Change

### Step 13: Revisit the Strategic Business Case and confirm the case for change

The purpose of this step is to confirm and update the case for change outlined in the Strategic Business Case (Stage 1). This is mainly to reflect changes in the internal and external landscape since the initial determination of the objectives. Changes may impact the following business case elements:

- need identification
- objective of the intervention
- strategic context and intention
- expected benefits, costs or risks
- relevant governance arrangements/ list of stakeholders.

The rationale for any significant changes or revisions should be clearly documented including the reasons why the conclusions of previous stages remain valid.



## 6.2.2 Cost Benefit Analysis

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### Step 14: Revisit the Strategic Business Case CBA to confirm the short list of options

The purpose of this step is to confirm or update elements of the Strategic Business Case including the option appraisal (Stage 1 CBA). Since the Strategic Business Case Stage, new information affecting the option appraisal (CBA in the Strategic Business Case) may have become available and it is important to ensure this is adequately reflected in the Detailed Business Case.

Changes might include:

- Further information becoming available including (but not limited to) costings, demographic drivers and valuation of benefits
- The expected benefits included in the Strategic Business Case, might be lower or higher due to more detailed scoping or additional evidence becoming available
- The expected costs included in the Strategic Business Case, might be lower or higher because of more accurate cost information becoming available or more refined project scoping
- The risk profile of specific options might have changed and as a result, initially unviable options might need to be further assessed
- Other key assumptions may have changed, resulting in options that were initially not shortlisted, now requiring consideration.

The rationale for any significant changes or revisions should be clearly documented. This should include why the conclusions of previous stages remain valid and consider whether any options previously eliminated from the Long List should be revisited based on the new, more accurate information.



## Step 15: Select preferred option – Conduct Stage 2 / Full CBA on short list of options

The objective of the Stage 2 or full CBA is to determine which of the options(s) shortlisted in Stage 1 and reconfirmed in Step 14 are likely to maximise social welfare and provide **the best value for money (the optimal mix of benefits, costs and risks)**.

The milestones in performing a CBA are outlined in Stage 1 of the Business Case (Step 10) and are also valid for Stage 2 CBA. In a similar way, the costs and benefits of the short-listed options are compared to the costs and benefits of the base case.

However, the Stage 2 CBA is a more detailed analysis of the Short List of options based on new and more accurate information than used in Step 14.

The additional detail may include:

- More accurate cost estimates, including more definitive project specifications, more detailed project scoping and current market costs
- More accurate benefit estimates, including market or service demand studies, valuation studies, stakeholder consultation plans and more details design specifications.

These more detailed and accurate cost and benefit estimates should then be utilised when performing a full CBA on the Short List of options. The full CBA will indicate the option with the highest expected net present value and the highest benefit cost ratio (BCR). The rationale for recommending the preferred option must be clear in terms of the evidence, assumptions used and calculations leading up to the option selection.

Refer also to Appendix 8 which outlines some aspects that are more developed in a Stage 2 CBA compared to a Stage 1 CBA.

### 6.2.3 Financial Analysis

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Along with the full CBA, the financial analysis is also used to evaluate the Short List of options and comprises:

- Full Financial Appraisal (FAP) that evaluates financial viability by calculating the net present value of estimated cash flows using a weighted average cost of capital, and
- Full Financial Impact Statement (FIS) that projects the impact of the options on key financial measures, such as the agency and State budgets.

## Step 16: Revisit the Strategic Business Case FAP and FIS to confirm the short list of options

The purpose of Step 16 is to review, and update as necessary, the Financial Appraisal (FAP) and Financial Impact Statement (FIS) prepared at the Strategic Business Case Stage. Following the Strategic Business Case Stage, new information affecting the option appraisal (FAP in the Strategic Business Case) may have become available.



The Short List of options may be impacted by the following changes:

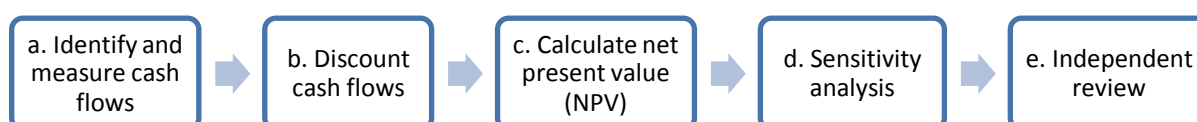
- additional or new information is available e.g. costings, demographic drivers, etc
- the expected revenue or cost streams, might be lower or higher due to more accurate or additional evidence
- the risk profile of specific options might have changed and, as a result, initially unviable options might need to be further assessed
- other key assumptions may have changed and this might mean options which were initially not shortlisted might require further consideration.

The rationale for any significant changes or revisions should be clearly documented. This should include why the conclusions of previous stages remain valid and consider whether any options previously eliminated from the Long List should be revisited based on the new, more accurate information.

### Step 17: Select the preferred option – Conduct Stage 2/ Full Financial Appraisal on short list of options

An initial FAP was conducted in Stage 1 of the business case (Step 11). Like the CBA, the key milestones of a FAP outlined in Stage 1 apply also in Stage 2. However, a Stage 2 FAP is a more detailed analysis of the Short List of options, using updated and more detailed and accurate evidence and assumptions on financial costs and benefits. These updated assumptions were identified in Step 16 and should be analysed in more detail compared to the parameters that may have been used in the initial FAP. The more accurate financial costs and benefits should then be applied to the Short List of options to indicate the option with the highest NPV and Profitability index.

The steps involved in preparing a **FAP** were outlined in Stage 1. The key milestones of a Stage 2 FAP likewise involve:



Please refer to Stage 1 (Step 11) for more detailed information on each milestone involved in conducting an FAP and conducting more detailed analysis of each milestone for the full FAP.

Generally, the option with the highest NPV and Profitability index will be the option that is selected. However, agencies should consider the results from the CBA analysis in Step 15, that assesses the net increase in social welfare, whereas the FAP reflects the net cost to the Budget.

#### Further information:

- NSW Public Private Partnerships Guidelines (TPP17-07), 2017- Preparation, Procurement and Contract Management.
- Refer to the Detailed Business Case Template for an example of a financial appraisal.



## Step 18: Prepare a Financial Impact Statement on Short List of options to define the impact of the proposal on costs and savings

An initial Financial Impact Statement (FIS) was conducted in Stage 1 of the business case (step 12). A Stage 2 FIS should be prepared and submitted for all shortlisted options requiring budget funding as part of the Detailed Business Case. This may include updates on the Short List of options using updated evidence and assumptions. Refer to the Detailed Business Case Template for an example of a financial impact statement.

### Selecting the preferred option:

Following the Stage 2 CBA, FAP and FIS a **preferred option** should be selected from the shortlist of options based on indicators such as BCR and NPV from the CBA and NPV and Profitability Index from the FAP. It should be noted that there are other factors which deserve consideration when selecting the preferred option. These might include early considerations on achievability, supplier capacity and capability and reputational and environmental risks and impacts.

In addition, as highlighted in the CBA, careful considerations need to be given to all significant qualitative aspects identified. Documentation of qualitative aspects and their importance, including the reasons why they could not be quantified, should be included in the detailed business case.

## 6.2.4 Commercial Analysis

The **purpose** of the Commercial Analysis is to develop a procurement approach that meets governance standards and maximises project benefits. Steps involved in this stage, including assessment of procurement options and specification of contractual terms, increase the confidence around cost and benefit estimates as well as the ability to deliver the project.

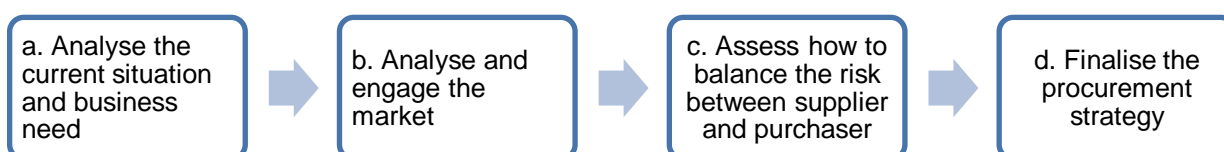
The Commercial Analysis involves following milestones:

- developing a procurement strategy (Step 19)
- specifying the technical requirements (Step 20)
- identifying any potential contractual issues (Step 21).

### Step 19: Develop a procurement strategy

A procurement strategy entails an appropriate procurement process and plan that is proportionate to the nature, size, complexity, value and risk of the service or product being procured.

The Detailed Business Case should address the following key steps in procurement planning:





Each of these key steps in procurement planning is discussed below:

**a. Analyse the current situation and business need**

- Determine if a new procurement arrangement is necessary, including the risks and costs of a new arrangement versus current arrangements (commonly addressed in the CBA)
- Assess whether the procurement capabilities are adequate
- Identify key stakeholders (internal and external) and develop an engagement strategy
- Determine whether the project should be procured as a whole or as separate parts.

**b. Analyse and engage the market**

The objective of this step is to develop a clear profile of the supply market, its capabilities and key drivers. Potential activities can include:

- Research innovative solutions in the supply market that meet the program objectives and deliver value for money
- Analyse the balance of power between the agency/Government and suppliers to assess the Agency's buying position versus the supplier. This helps to identify areas where Government can leverage its position to improve procurement outcomes.
- Early industry engagement with potential suppliers, including small and medium enterprises. Consulting suppliers before the project is committed, allows for a better understanding of suppliers' capability, resulting in more accurate estimated costs which contributes to potentially reduced transactional costs.

When engaging with potential suppliers, it is important to respect their commercial confidence and intellectual property rights. Additionally, communication should be clear on whether a commitment to proceed is provided at this stage.

**c. Assess how to balance the risks between supplier and purchaser**

The Procurement Strategy should consider and document how risk and liability will be apportioned between the parties, based on each party's abilities to manage the risks. This involves:

- Clearly defining the roles and responsibilities of purchaser and supplier
- Developing and documenting an approach to proportionate liability (refer to the Procurement Policy Framework and Procurement Board Directions for more information)
- Defining types and level of insurances required, factoring in the potential impact on the supply market and/or project costs as well as any other warranties or guarantees.

**d. Finalise the procurement strategy - Summarise key findings about procurement options, business needs, key risks and opportunities**

- Determine the level of business criticality of the project
- Consider different strategic options including ways to approach the supply market (e.g. multi-phased process and open or selective tender), defining procurement benchmarks and KPIs
- Document the risk assessment including the approach to liability and insurances
- Identify the benefits to be realised from the procurement including baseline values
- Address any regulatory issues (e.g. privacy, conflicts of interest; and necessary certifications, applicable Australian or international standards and planning approvals)
- Select and define the procurement method and provide an overarching project plan.



## Step 20: Specify technical requirements

Technical requirements of the service/asset that is being procured are a key element in guiding procurement selection. The purpose of specifying technical requirements is to set the quality and performance standards for the service/asset.

In general, the outline of technical requirements should be functional rather than merely a generic description, brand name, or references which would favour or hinder specific providers, products or services. That is, include details describing the service/asset in terms of its intended function and the required level of performance.

## Step 21: Identify contractual issues

Defining the appropriate form of contract between the organisation and the supplier forms the basis for ensuring high quality and cost-effective methods to achieve the objectives and might include:

- type of contract that ensures the best fit for the type of procurement and the nature of the project
- contract management on an ongoing basis as well as the likelihood and degree of the benefit realisation being affected by contractual terms and incentives
- accounting standards, that ensure adequate representation on the agency's financial statements during and after procurement
- regulatory and other implications, e.g. privacy, conflict of interest and necessary certifications/planning approvals.

If the program proposal is approved, agencies should proceed to formally approach the market, select vendor, and negotiate and award contract and implement and manage arrangement phases of procurement.

### Further information:

- NSW Procurement: Policy Framework for NSW Government Agencies (2015), NSW ProcurePoint
- NSW Department of Finance & Services: Market Approaches Guide (2015), NSW ProcurePoint
- NSW Public Private Partnerships Guidelines (TPP17-07), 2017 - Preparation, Procurement and Contract Management
- NSW Procurement Service Centre, NSW ProcurePoint
- Chief Procurement Officer of your agency
- Statement on Value for Money, NSW ProcurePoint
- NSW Government Action Plan: A ten point commitment to the construction sector (June 2018), Infrastructure NSW.





## 6.2.5 Management Analysis

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The **purpose** of the Management Analysis is to provide the assessor of the business case with confidence that an economically and financially viable solution is also realistically implementable, its risks are manageable and its benefits can be tracked and realised.

The management analysis includes a range of activities that are described more detail below.

### Step 22: Establish clear governance arrangements

Clear governance arrangements are critical to the proposal's successful implementation. Demonstrating effective project governance includes describing:

- the governance structure and roles and responsibilities
- project management structure including key roles and responsibilities
- project reporting, monitoring and evaluation arrangements
- any supporting assurance arrangements.

Inter-agency collaboration is encouraged. Where collaboration across departmental portfolios is necessary, appropriate lead and inter-agency arrangements should be formalised and documented. The governance arrangements should also allow for the fast and proactive management and escalation of issues, risks and/or disputes to the appropriate body or person for resolution. It may be appropriate to review governance arrangements on an ongoing basis and make appropriate adjustments to reflect the lifecycle stage or changed circumstances impacting the proposal.

Specific governance requirements may be required for Public Private Partnership (PPP) projects. There may be an opportunity to utilise existing governance structures where appropriate, e.g. utilising a steering committee for more than one proposal.

Refer to Appendix 9 for a table of common governance arrangements.

### Step 23: Establish a project management strategy, framework and plan

The **purpose** of this activity is to ensure that strategies, frameworks and plans are in place to ensure the project is well managed and is achieving its targets.

**Project management** is a structured framework for defining and implementing change within an organisation. The level of detail and the sophistication of the project management plan should be at a high level at the detailed business case stage.

The **project plan** is the document that describes methods, timeframes and responsibilities for a target or milestone to be achieved. At a minimum, a project plan should include:

- key milestones and timeframes associated with each stage of implementation
- proposal dependencies - i.e. deliverables from other related projects
- key decision points and identification of any independent assurance requirements
- governance and resourcing arrangements, including staff.



## Step 24: Establish a change management strategy and plan

The **purpose of the change management strategy** is to assess the impact of changes associated with the proposal, on the culture, systems, processes and people working within the delivery agency and other affected agencies, as well as other stakeholders (e.g. the public). Various management strategies can be adopted for implementing change, depending on the nature of the proposal. The agency's choice of change management strategy should be detailed comprehensively, together with underlying communication and development strategies.

A **strong change management plan** indicates how affected organisations, business units and relevant staff have contributed or been involved in the preparation of the change management plan to date and have confirmed that the impacts of change are manageable.

### Further information:

- Information Management Framework: Change Management Guidance (2014)
- NSW Department of Finance, Services and Innovation
- Agency Change Management Guidelines, (D2011\_014, 2011), NSW Department of Premier and Cabinet.



## Step 25: Develop a benefits plan and register

Benefits Realisation Management involves monitoring benefits identified in the business case to inform investment decisions and optimise the realisation of benefits. It is an active approach that collaborates with stakeholders in an ongoing search for benefits and includes developing a benefits plan and register. The interrelationship of benefits and change management is paramount for the successful delivery of a program.

Benefits are the main reason for investment in a project or program, and planning for benefits realisation should commence during the development phase of the business case. Benefits management begins with defining the project objectives (Step 2) and the benefits they will deliver (Step 4). Early identification and understanding of benefits helps when refining the business case as it is developed.

Benefits management asks the following key questions:

- why are we undertaking the program?
- what are the strategic outcomes of the program?
- what are the measurable benefits?
- how will they be measured?
- when will we realise the benefits?
- who owns the benefits?
- what is the mechanism required to realise the benefits?

The *NSW Benefits Realisation Management Framework* provides a structured tool to assist in identifying potential benefits, their valuation, planning, modelling and tracking as well as the assignment of responsibilities and accountabilities on delivering these benefits. This framework provides best practice principles and concepts for benefits realisation across NSW agencies. It helps agencies to:

- focus on the most important benefits
- assign and track accountabilities for the benefit realisation
- improve communications with stakeholders
- improve the chances of successful business change by focusing on outcomes
- identify, manage and mitigate the risks associated with the realisations of the benefits
- provide input for program evaluations.

Key performance indicators (KPIs) should measure whether the benefits are being realised and the business need/challenge or opportunity has been adequately addressed.

### Further information:

- Benefit Realisation Management Framework v3 (Part 1-5, 2018), NSW Department of Finance, Services and Innovation



## Step 26: Establish a risk management strategy, framework and plan

The business case should include a risk management strategy, framework and plan. Risks should be regularly monitored from the early stages of the business case and as part of options generation and assessment. Key stakeholders should be consulted regarding risk throughout the lifecycle of the proposal. Once a preferred option has been selected, risk management processes specific to that option need to be established to inform the implementation process.

**Risk management** is a structured approach to identifying, assessing and controlling risks related to the project. The purpose of risk management is to enable the agency to:

- understand the potential threats and opportunities to the achievement of the proposal's objectives and address their impact
- maximise opportunities to achieve the targets and objectives set.

### Ongoing management and revision of risks

A detailed business case should include a **robust plan to manage project risks** continuously and as part of the agency's Enterprise Risk Management (ERM) framework to avoid silos (in line with AS/NZS ISO 31000:2018).

This process of managing project risks involves:

- outlining **project risks** and how these will be addressed, managed and mitigated within the agency's existing ERM framework
- outlining the methods to ensure that relevant risks are identified, risk mitigation actions to be taken and risk management controls implemented
- updating reviewed risk registers regularly as part of future project management board and/or risk management board meetings. Refer to Appendix 10 for key inclusions in a risk register.

Project risks should be:

- identified through workshops and stakeholder and expert interviews
- assessed in accordance with the Agency's risk management framework
- visible at the appropriate level of senior management
- supported by the proposal's governance structure
- assigned to a risk owner.

### Further information:

- Risk Management Toolkit for the NSW Public Sector (TPP12-03)
- Internal Audit and Risk Management Policy for the NSW Public Sector (TPP15-03)



## Step 27: Establish a post implementation evaluation plan

The **purpose** of a post implementation evaluation is to examine the outcome of a project including its progress (did benefits outweigh the final costs), timeframes and responsibilities in delivering the project that was defined.

Evaluations are a key input into the evidence base used for outcome budgeting. Under the NSW Government Program Evaluation Guidelines there are many different evaluation approaches that can be used. The three most common are process, outcome and economic evaluations (Refer to Appendix 11 for guidance on the different evaluation approaches).

The **purpose of the evaluation plan** is to establish the direction of the evaluation. The evaluation plan describes how the project will be monitored and evaluated, as well as how the evaluation results will be used for project improvement and decision making.

The following should be considered as part of developing an evaluation plan:

- define the program logic which maps the relationships between the outputs, outcomes and objectives of the project
- identify the key evaluation questions to establish what should be evaluated
- identify how the business case objectives will be measured
- select an evaluation methodology (experimental, quasi-experimental or non-experimental) based on the program logic
- identify which components of evaluation will be undertaken (ideally process, outcome and economic)
- scope the desired minimum data set to inform the evaluation including use of existing data and potentially the need to collect additional data
- define when evaluation activities should commence (in relation to project implementation, data availability, and key future decision points)
- establish appropriate governance and oversight for evaluation
- assess whether the expertise to conduct the evaluation is available in-house or it should be procured
- establish quality control mechanisms for the evaluation, including peer review
- for human services programs in particular, if data linkage is required or primary research is being conducted, then appropriate approval may be required from a Human Research Ethics Committee.

Evaluation planning should start when the project or program is being designed, with much of the planning completed before the project or program has started to operate. This maximises opportunities for collecting and/or utilising relevant data (or defining a control group or counterfactual).

The scope of the evaluation as articulated in the evaluation plan will also help agencies understand the resources that will be needed for conducting the evaluation, including evaluation and technical expertise.

### Further information:

- The NSW Government Program Evaluation Guidelines (2016), NSW Department of Premier and Cabinet
- The Department of Premier & Cabinet's on-line evaluation Toolkit is helpful for more guidance on developing your evaluation plan.

## 7. Next steps and updates to the business case process

Once the detailed business plan has been completed, that is not the end of its use. The business plan should be used to facilitate delivery of the proposal, from procurement to completing the project, and then to evaluate the benefits obtained.

The business case process is an iterative process that evolves over time and therefore should be regularly updated to reflect the changes in inputs, assumptions and evidence.

Updates to the business case are recommended as good practice.

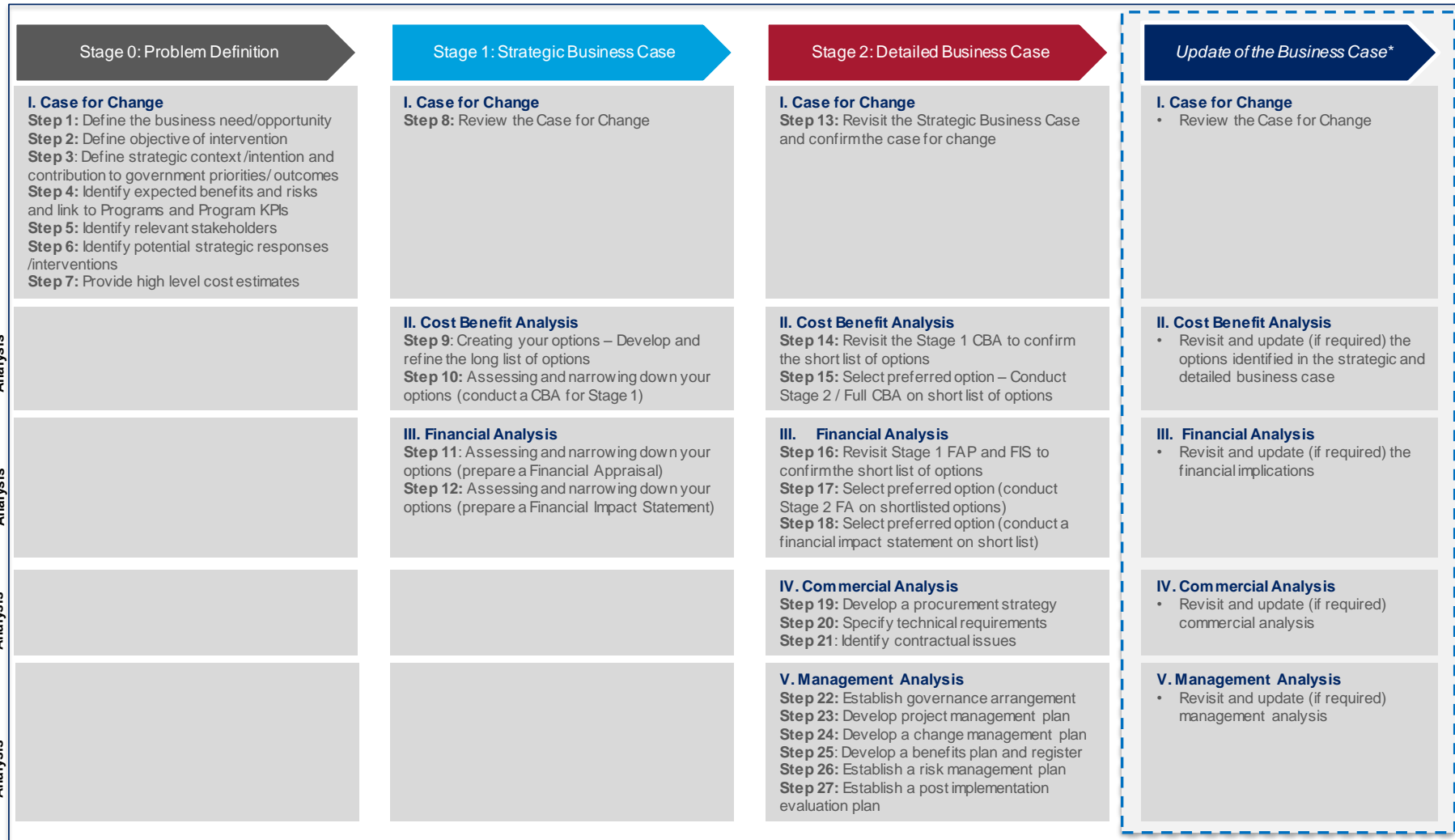
The activities following the detailed business case include initiation of the procurement process, selection of the preferred supplier, and the start of project implementation. These steps might significantly affect the inputs and assumptions that were used in the original business case.

In addition, legislative and regulatory factors might impact the analysis undertaken as part of the business case, especially in situations where there is a time lag between the funding commitment and the start of the investment implementation. Therefore, major variances in time, costs, contingency funds, scope and approved budgets throughout the implementation process of an investment should be documented.

Steps involved in reviewing and updating the business case process may include:

- revisit and confirm all the analysis dimensions of the detailed business case
- identify the supplier or partner offer that optimises value for money
- set out the negotiated commercial and contractual arrangements in case of a procurement
- confirm that final investment arrangements are affordable
- define any changes to success factors necessary to monitor the project implementation and undertake data monitoring and collection, consistent with the program evaluation plan and benefits realisation plan.

## Appendix 1: Overview of the business case process and steps



\*These steps are recommended as updates post procurement once the preferred supplier has been identified

## Appendix 2: Financial Appraisal

### Typical Cash Flows in a Financial Appraisal (FAP)

Table 1: Typical Cash Flows in a FAP

Typical cash flows	
Inflows	Outflows
<ul style="list-style-type: none"> <li>Operating revenues</li> <li>Subsidies from external parties</li> <li>Operational cost savings in other areas</li> <li>Surplus asset sales</li> <li>Value of options resulting from the project</li> <li>Residual or project values at end of appraisal term</li> </ul>	<ul style="list-style-type: none"> <li>All capital and operating costs</li> <li>Taxes</li> <li>Operating lease payments</li> <li>Worker redundancy payments</li> <li>Existing contract termination payments</li> <li>Revenue from existing operations that will cease</li> <li>Opportunity costs of resources (including land)</li> </ul>

### Differences between CBA and FAP

Table 2: Differences between CBA and FAP

	Cost Benefit Analysis (CBA)	Financial Appraisal (FAP)
<b>Focus</b>	Demonstrate Value for Money and return to society of options – relative to the base case	Demonstrate affordability and funding implications for preferred options
<b>Perspective</b>	NSW or national under certain circumstances	Whole of Government or the entity considering proposals
<b>Basis for valuation of costs and benefits</b>	Reflects opportunity cost of resources used for the project or program	Does not indicate of the real value of the alternative use of the resources
<b>Recognised flows</b>	<ul style="list-style-type: none"> <li>Benefits and costs reflected in real terms</li> </ul>	<ul style="list-style-type: none"> <li>Cost and revenue flows reflected in nominal terms</li> </ul>
<b>Costs</b>	<b>Excluded:</b> <ul style="list-style-type: none"> <li>financing costs (e.g. the payment of interest or dividends),</li> <li>taxes (in most cases),</li> <li>depreciation and</li> <li>amortisation on the fiscal position</li> </ul>	<b>Included:</b> <ul style="list-style-type: none"> <li>interest expenses</li> <li>taxes</li> <li>revenues generated</li> <li>maintenance</li> <li>government expense and revenue impacts</li> </ul>
<b>Discount rates</b>	<b>Real discount rates:</b> reflects long term social opportunity cost of capital (i.e. for society collectively, including public and private sectors).	<b>Nominal discount rates:</b> reflects the cost of capital to the entity undertaking the proposal, but also rate of return for the project/ project specific risk



Table 2: Differences between CBA and FAP (continued)

	Cost Benefit Analysis (CBA)	Financial Appraisal (FAP)
<b>Other</b>	Included: <ul style="list-style-type: none"> <li>• spill over impacts on the rest of the economy (private businesses and households),</li> <li>• natural capital</li> <li>• other impacts not necessarily priced by the market but that can affect social welfare.</li> </ul>	
<b>Capital expenditure</b>	Capital expenditure is recognised as a resource cost at the time it is incurred	Gross capital expenditure (separating government and non-government contributions) over the life of the project for taxation and other purposes

Source: TPP 17-03, NSW Government Guide to Cost –Benefit Analysis, Page 68

## Estimating cash flows for financial appraisals

### ***Inflation***

All cash flows should be estimated in nominal terms, thus including inflationary escalations. Judgement is required in choosing the escalation rate and the reasons for deciding on the applied rate should be clearly disclosed in the appraisal.

### ***Long-term projects***

While it might be impractical to estimate all cash flows for the entire life of a very long-term project (e.g. beyond 20 years) it might be possible to forecast an annuity stream representing the net cash flow. Uncertainty regarding the annuity estimate can be reflected in the discount rate adopted, with a higher discount rate applied in situations of greater uncertainty.

### ***Option valuation***

An option arising from a proposed project can have a real value to the sponsoring entity. That value should be included in the FAP. Types of options might include:

- Options to expand the project or extend its life
- Options to abandon the project.

### ***Residual value***

A residual value should be estimated whenever an asset's life is:

- Longer than the life of the proposed project and there is an intention to dispose of the asset
- Longer than the appraisal period.

Estimating residual values can be difficult. Familiarity with the asset class is vital. The table below sets out examples of considerations that might be relevant in some circumstances.

Examples of considerations relevant to estimates of residual value	
<b>Observation of a traded market</b>	Market residual values of assets of a similar age might be observable in active second-hand markets.
<b>Professional residual valuations</b>	Engagement of expert advice can provide precision and mitigate risks of an inappropriate estimate.
<b>Long-term projects</b>	If a project's life is greater than 20 years, rather than estimating residual value at the project's final year, it might be simpler to value the asset as an annuity stream for the full life of the project.

**Financing**

Proposed projects should be assessed initially on a stand-alone basis before financing strategies are considered.

If, having established that a proposed project has a positive Net Present Value (NPV), it is determined that it could be financed through operating leases (rather than financed internally), the operating leases should be evaluated as cash outflows. They must be compared to an outright purchase alternative. Consideration also must be given to renewal or purchase rights where they prevail.

**Tax considerations**

The prevailing Australian corporate tax rate should be applied when undertaking a FAP.

Project cash flows should include any annual depreciation tax shields because these benefits are not reflected in the post-tax Weighted Average Cost of capital formula.

The effects of dividend imputation should be taken into account for competitive neutrality reasons. Imputation effects can be handled through adjustments to the cost of capital formula.

Also, note that effective 1 July 2019, the concept of operating leases for lessees will be effectively abolished with the issue of Australian Accounting Standard AASB 16 *Leases*.

**Exclusions from FAP**

Examples of items to be excluded:	Rationale:
Interest impacts	By using a post-tax Weighted Average Cost of Capital, government entities will capture project interest expense (and associated tax benefits) in the project's discount rate. To avoid double counting, therefore, interest impacts should not be included in project cash flows.
Accounting depreciation, economic multiplier effects and sunk costs.	These factors do not impact on a proposed project's viability.

## Differences between a Financial Appraisal and a Financial Impact Statement

**Table 3: Differences between a Financial Appraisal and a Financial Impact Statement**

<b>Financial Appraisal</b>	<b>Financial Impact Statement</b>
Details on periodic cash flows for the entire analysis period (up to 20-30 years)	<ul style="list-style-type: none"> <li>Nominal (undiscounted) cash flows over the life of the project</li> <li>Government revenue, recurrent expense and capital expense impacts</li> </ul>
Discounted to NPV terms	<ul style="list-style-type: none"> <li>More high-level and typically shows only aggregate impacts, where those impacts specifically measure changes relative to what is in the agency's Budget forward estimates, not necessarily the total cost of the proposal.</li> </ul>
Cash Basis	<ul style="list-style-type: none"> <li>Accrual Basis</li> </ul>

## Appendix 3: Business Cases under Outcome Budgeting

Commencing from the 2018-19 Budget, the NSW Government committed to implementing outcome budgeting to enhance the efficiency and effectiveness of public spending. This involves a shift in resource allocation planning and decision making - from a focus on outputs or services provided, to a focus on the contribution that public spending makes to the outcomes and benefits for the people of NSW.

Business cases are key in ensuring investment decisions deliver the best objectives, State Outcomes and benefits for the people of NSW. Business cases should identify the specific objectives and benefits that will directly accrue from the proposed project and how these link to strategic Government priorities, i.e. the State Outcomes.

There are several key enablers for this shift in focus to State Outcomes. In 2017-18, budgeted expenditure for Clusters/Agencies was consolidated into Programs which were then aggregated into Program Groups. From 2018-19 onwards, Programs and Program Groups have been linked meaningfully to State Outcomes based on a robust results logic. To track progress over time, performance information at each level of this results hierarchy is now available systematically as headline indicators for State Outcomes and KPIs for Programs across the whole of Government.

Accordingly, from 2018-19 onwards all New Policy Proposals (NPPs) will be linked to Programs in PRIME and thus linked to State Outcomes. Cluster bilateral and ERC decision-making will be driven by a comprehensive top-down perspective focused upon whole-of-Government priorities, i.e. State Outcomes and a review of base expenditure. It will no longer be a bottom-up process, detached from strategic priorities, and focusing on a review of incremental expenditure and its ex-post consolidation.

**Figure 1: The interconnection between Programs, Program Groups and Outcomes (Outcome Budgeting)**



For NSW Treasury, these changes will facilitate a better understanding of investment rationales and their prioritisation by Clusters/Agencies. It will also equip Treasury and ERC with appropriate insight on the strategic potential of projects and, subsequently, their performance. This in-turn, will aid evidence-based resource allocation decisions.

The processes identified and defined in these Guidelines support the move to Outcome Budgeting and evidence based investment decision making. i.e. the information and evidence assessed by Treasury that provides recommendations to Cabinet on funding requests and is assessed by Gateway Review Panels.

## Appendix 4: Style tips for writing a business case

The business case is a critical part of an agency's robust, transparent and accountable decision-making process. A business case should not be perceived only as an exercise in compliance or in securing support for policy change and/or funding. This view will not deliver the intended benefits from the business case process and could ultimately result in poor decisions. Each element of the business case should be supported by robust evidence to justify the investment decision.

While some business cases and supporting documentation will necessarily include technical information, the business case should avoid technical jargon as far as possible. It should be easy-to-read and understandable to non-specialists and those with no prior knowledge of the proposal or service area. The level of technical detail should be commensurate to the size, risk and complexity of the proposal and focus on quality and relevance rather than quantity.

In general, the business case should:

### 1. Have an executive summary

The executive summary is a high-level view of the business case proposal. It is usually the first section of the business case, but is usually written once the business case analysis is complete.

The executive summary should include **a statement of purpose**, setting out the purpose of the business case and explicitly stating if it is being prepared for Cabinet approval.

The executive summary should explain the problem to be addressed and major considerations including customer centric objectives, stakeholders and resources required to complete the desired objective as well as the final recommendation. Some stakeholders may only focus on reading the executive summary, so it is essential that the business case key findings and information needed to inform decision making are included and written concisely in plain English.

### 2. Include a candid and robust presentation of the decision-making process and alternatives considered

The business case should contain sufficient evidence to support any conclusions and recommendations. Business cases that only discuss a base case (minimum amount of government's involvement) and a preferred option can easily seem to be an advocacy exercise rather than assessment of the best way to deliver against the objective.

### 3. Include clear description of assumptions used

Clearly describe and document assumptions underpinning the business case. Where practicable, assumptions should be tested against relevant evidence and updated as the business case is developed or where more accurate information becomes available.

### 4. State all relevant sources for data / inputs used

Often the inputs/assumptions are identified from agency documentation. Relevant data, however, may come from external sources, such as key stakeholders and/or subject matter experts. It is essential to record the logic used to generate the data and inputs, and their source.

### 5. Include appendices

The flow of the document should be maintained by attaching supporting information as appendices. It is important to ensure that all information relevant to the decision-making process has been included in the business case, with clear references to the analysis and assumptions used.

## Appendix 5: Example of defining benefits

An example of defining benefits that have been realised from similar projects, is illustrated below.

**Example: Does the existing evidence obtained from post-evaluation findings of similar interventions and/ or existing literature support the benefits identified?**

**Objective:** Achieve at least a 5% (p.a) reduction in the number of people in NSW experiencing smoking related health issues

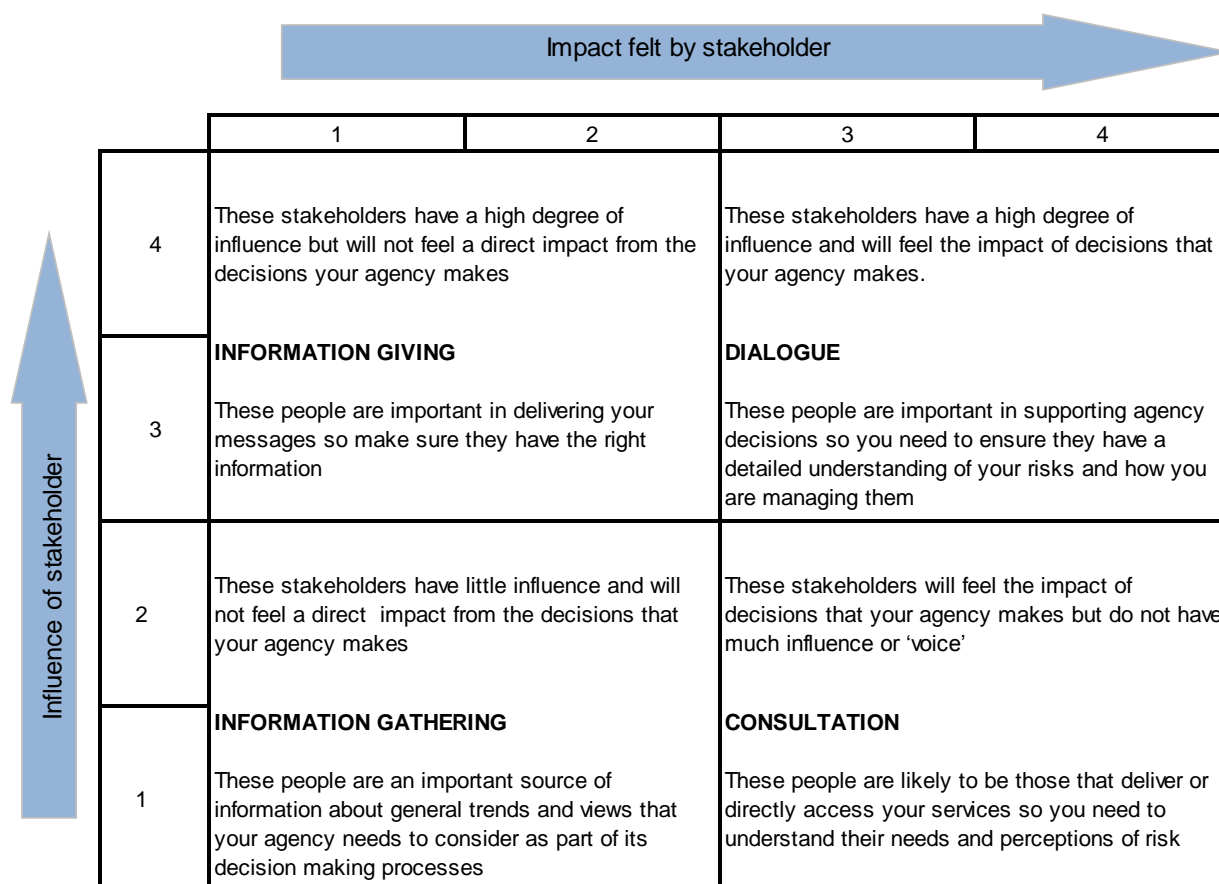
**Summary of findings:**

Projects	Evidence on generated benefits
A: Smoking Awareness Campaign	“A <b>6% (p.a) reduction in smoking related health problems for NSW residents</b> using post-implementation results”
B: Ban on outdoor smoking in public areas in another jurisdiction	“A <b>7% (p.a) reduction in smoking related illnesses for NSW residents</b> over 5 years post-implementation was achieved”
C: Introduction of a tax on smoking consumption in another jurisdiction	“ <b>Reduction of 4% (p.a.) in the number of people in NSW experiencing smoking related health issues</b> over a 10 year post-implementation period”
D: A study on urban lifestyles and an increase in open spaces and better transport facilities	“Observed no tangible effect <b>in NSW residents facing smoking related health issues</b> ”

The evidence suggests that projects A, B & C have been used to achieve similar outcomes to that stated in the objective. The insights and findings of these projects should be used as an input in the development of strategic responses and option identification explained in Stage 1 of the business case process. The evidence also suggests that project D may not be appropriate to achieve the stated objective.

## Appendix 6: Stakeholder map

Figure: Stakeholder Map



## Appendix 7: Option generation tools

### Tools to support generating options

Early engagement with **benefit owners** (refer to Step 25: Management of the benefit realisation) when generating options will help ensure that:

- options for service responses are informed by insights gained from front-line delivery
- benefits associated with each option are both realistic and achievable.

The benefits of early engagement with benefit owners are that financial analysis and economic appraisal are more robust, and any savings or efficiencies identified are sustainable.

Evidence for generating options could also come from the following:

- **Research reports** and consultations with **subject matter experts** and practitioners to collect the set of available data/ information relevant to the objectives and scope of the problem
- **Screening of a full range of policy instruments** or projects that may be used to meet the objectives
- **Best practice solutions**, including international examples
- **Literature reviews**, especially systematic reviews and meta-analyses
- Considerations of **external factors** that might impact the objectives
- Inclusion of **extreme options** as part of the early assessment. These might provide useful information to test the parameters for feasible solutions
- **Early engagement with the market** to understand possible solutions and assess capability and capacity in delivering the identified options.
- The wide range of **policy tools available** including provision of information, Taxes, Regulation, Commissioning/NGO provision and government provision
- **Evidence** on key learnings from previous projects. Contact your CBA analyst at Treasury for further information.

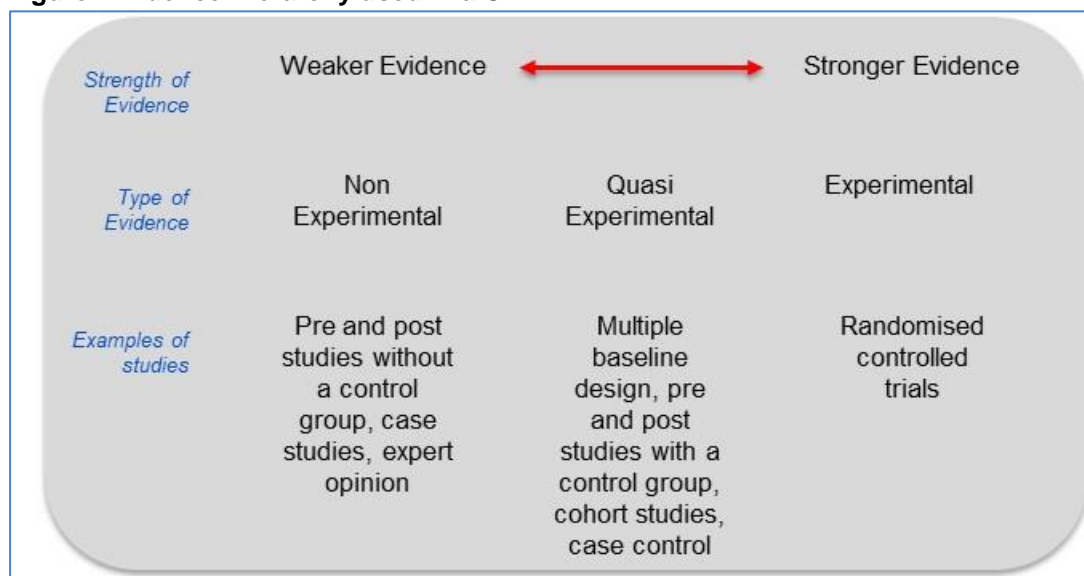


## Appendix 8: Differences of a Stage 2 CBA compared to Stage 1

**Table: Key differences of Stage 2 as opposed to Stage 1 CBA - Examples**

<i>More accurate cost estimates</i>	<ul style="list-style-type: none"> <li>• more definitive project specification and design</li> <li>• better information about conditions of planning approval</li> <li>• more detailed project scoping</li> <li>• current market costs</li> <li>• detailed quantity surveying</li> </ul>
<i>More refined benefit estimates</i>	<ul style="list-style-type: none"> <li>• detailed market or service demand studies</li> <li>• valuation studies</li> <li>• clearer definition of target beneficiaries</li> <li>• stakeholder consultation plans</li> <li>• detailed program design specifications</li> </ul>

**Figure: Evidence Hierarchy used in a CBA**



Source: NSW Government Program Evaluation Guidelines, January 2016.

## Appendix 9: Common governance arrangements

Table: Common governance arrangements – Elements and Description

Elements	Description
<b>Steering committee</b>	Usually established by a reference group to drive major proposals. Skills may be sourced from: <ul style="list-style-type: none"> <li>▪ the agency</li> <li>▪ the broader public sector</li> <li>▪ stakeholders, or</li> <li>▪ the private sector.</li> </ul>
<b>Project control group</b>	The group: <ul style="list-style-type: none"> <li>▪ reports to the steering committee</li> <li>▪ includes representatives from key stakeholders</li> <li>▪ closely monitors the project to ensure it stays on time and to budget and that the key deliverables in the project brief are met.</li> <li>▪ advises on and mitigates high-level risks</li> <li>▪ ensures the necessary project resources are available</li> <li>▪ ensures the appropriate range of stakeholders are involved in the project</li> <li>▪ reviews project reports provided by the project team.</li> </ul>
<b>Senior Responsible Officer – Day to Day Project Manager</b>	The visible owner of the project who drives the change process. The role is accountable for successful delivery (program meets its objectives and delivers the projected benefits) and is recognised throughout the organisation and beyond as the key leadership figure in driving the change forward.
<b>Project sponsor</b>	The project sponsor is the designated person to provide the resources for the project. The project sponsor has the ultimate responsibility for the deliverables outlined within the proposal and the realisation of objectives and benefits. The sponsor must have good visibility of the proposal, play an active role, and be accountable for guiding its progress.
<b>Project director</b>	Will usually be appointed by the project sponsor and has responsibility for delivering the proposal and managing the project team, including any external consultants. The project director must understand both the government and commercial processes applicable to developing and negotiating contractual arrangements.
<b>Probity advisor</b>	May be required depending on the scale, complexity and sensitivity of the proposal or the procurement method to be adopted. The role of the probity advisor is to ensure a fair, transparent, defensible and robust process is followed.
<b>Project team</b>	Must possess the skills and resources to develop and deliver the proposal. This may include: technical, planning, economic, financial, operational, community relations, environmental and legal skills.

## Appendix 10: Risk register

Key aspects of a risk register may include:

- risk ID (this is a unique identifier)
- entry date (into risk register)
- name of the person(s) assessing the risk
- description of the risk
- objective(s) that will be affected by the risk
- risk assessment information, such as: the worst-case consequence, likelihood and risk level:
  - the current controls and their effectiveness
  - the current consequence likelihood and risk level
  - whether the risk is acceptable or tolerable
  - additional treatments if the risk is not acceptable or tolerable
  - the residual risk level once additional treatments have been implemented
- risk owner – who is responsible for managing the risk
- monitoring information – how and when the risk and its controls will be reviewed and reported
- the date the risk register was last updated
- risk category (e.g. Financial, Service Delivery, Work Health and Safety).

## Appendix 11: Project evaluation plan approaches

**Table: Types of evaluation**

Type	Focus
<b>Process evaluation</b>	Evaluates how the project is delivered, including efficiency, quality and customer satisfaction. May consider alternative delivery procedures. It can help to differentiate ineffective programs from failures of implementation. As an ongoing evaluation strategy, it can be used to continually improve programs by informing adjustments to delivery.
<b>Outcome evaluation</b>	Determines whether the project caused demonstrable effects on specifically defined target outcomes i.e. the business case objectives. Identifies for whom, in what ways and in what circumstances the outcomes were achieved. Identifies unintended impacts (positive and negative). Examines the ways the project contributed to the defined objectives and how it contributed to State Outcomes, and the influence of other factors.
<b>Economic evaluation</b>	Addresses questions of efficiency by standardising objectives and benefits in terms of their dollar value to answer questions of value for money, cost-effectiveness and cost-benefit.

## Glossary

<b>Analysis period</b>	Time over which a project or program is assessed, i.e. the period for which costs and benefits are estimated.
<b>Base Case</b>	The scenario against which proposals are compared, and which shows baseline projections of costs and benefits 'without' the project or program
<b>Benefit</b>	Measurable advantages gained by undertaking an intervention to address the defined objective. e.g. increase efficiency, effectiveness, quality and safety or equity
<b>Benefit Cost Ratio/ BCR</b>	The ratio of the present value of total benefits to the present value of total costs
<b>Business case objective</b>	Reason for the proposed intervention and is linked to State Outcomes and Programs
<b>CIC</b>	Cabinet Infrastructure Committee
<b>Costs</b>	Reductions in social wellbeing
<b>Cost Benefit Analysis/ CBA</b>	An appraisal and evaluation technique that estimates the costs and benefits of a project or program in monetary terms
<b>Discount Rate</b>	The rate used to convert future streams of costs and benefits into today's dollar value (present value)
<b>ERC</b>	Cabinet Standing Committee on Expenditure
<b>ERM</b>	Enterprise Risk Management
<b>Evaluation</b>	Analysis of a project, program or policy to assess how successful (or otherwise) it has been, and to learn lessons for future improvement
<b>Financial Analysis (FA)</b>	Financial Appraisal and Financial Impact Statement
<b>Financial Appraisal (FAP)</b>	Appraisal of the cash flows of a project or a program
<b>FIS</b>	Financial Impact Statement
<b>KPI</b>	Key performance indicators
<b>Market failure</b>	A situation where the market fails to supply a socially optimal level of a good or service
<b>NPP</b>	New Policy Proposals
<b>Net Present Value (NPV)</b>	The net discounted value of a stream of either future costs and benefits. The NPV is used to describe the difference between the present value of a stream of costs (NPC) and the present value of a stream of benefits
<b>p.a.</b>	Per annum
<b>PPP</b>	Public Private Partnership
<b>Project</b>	The planned set of interrelated tasks to deliver a specified result, service or product to address the business case objectives. A project is typically characterised by a fixed time period for delivery, with a specified budget or set of predetermined resources. The project will link to programs defined in Stage 0
<b>Program</b>	A coherent set of activities managed together over a sustained period of time, for producing outputs that contribute to a State Outcome
<b>Program KPI</b>	Key performance indicators to measure how successful the Program has been in reaching its objectives and contributing to State Outcomes
<b>Risk</b>	Refers to situations where different possible outcomes have known probabilities
<b>Risk Management</b>	Risk management is a structured approach to identifying, assessing and controlling risks related to the project
<b>State Outcome</b>	The primary purpose for which Budget funding is being expended. It is defined to clearly explain to the public what a sub-national government is seeking to achieve for its citizens. State Outcomes will be sufficiently granular to aid resource allocation decisions, be fairly consistent over time and will have indicators to track progress
<b>SIS</b>	State Infrastructure Strategy
<b>Weighted Average Cost of Capital (WACC)</b>	Discount rate used in Financial Appraisal analysis. WACC is the entity's cost of capital which is the rate the entity is expected to pay on average to all its security holders to finance its assets

# TPG23-08

# NSW Government Guide to Cost-Benefit Analysis

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February 2023

## Acknowledgment of Country

We acknowledge that Aboriginal and Torres Strait Islander peoples are the First Peoples and Traditional Custodians of Australia, and the oldest continuing culture in human history.

We pay respect to Elders past and present and commit to respecting the lands we walk on, and the communities we walk with.

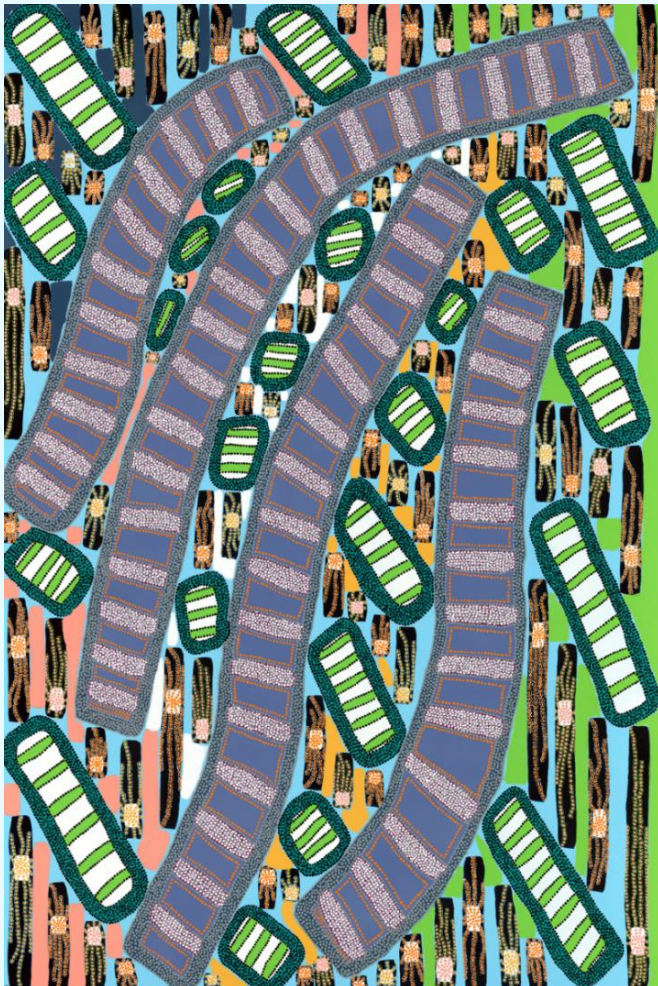
We celebrate the deep and enduring connection of Aboriginal and Torres Strait Islander peoples to Country and acknowledge their continuing custodianship of the land, seas and sky.

We acknowledge the ongoing stewardship of Aboriginal and Torres Strait Islander peoples, and the important contribution they make to our communities and economies.

We reflect on the continuing impact of government policies and practices, and recognise our responsibility to work together with and for Aboriginal and Torres Strait Islander peoples, families and communities, towards improved economic, social and cultural outcomes.

Artwork:

*Regeneration* by Josie Rose





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Key information	
Treasury Policy and Guidelines (TPG) is relevant to?	<input checked="" type="checkbox"/> GSF Agencies <input checked="" type="checkbox"/> General Government Sector <input checked="" type="checkbox"/> Public non-financial corporation <input checked="" type="checkbox"/> Public financial corporation <input checked="" type="checkbox"/> State Owned Corporations <input type="checkbox"/> Other
	<input checked="" type="checkbox"/> Executive agencies related to Departments
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<input checked="" type="checkbox"/> <b>GUIDANCE/ADDITIONAL INFORMATION</b> to provide clarity or explain requirements in detail.	

**Revision history**

Document version number	Approval Date	Author	Approver	Description

# NSW Government Guide to Cost-Benefit Analysis

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## Purpose

This [NSW Government Guide to Cost-Benefit Analysis](#) (the Guide) is a Treasury Policy and Guidelines paper that sets out how to undertake cost-benefit analysis (CBA) for NSW government initiatives. It also describes the role of CBA in supporting evidence-informed decision making and provides guidance for practitioners. It is central to the NSW investment framework for the appraisal and evaluation of public investments.

CBA is the preferred method for appraising the economic, social, environmental and cultural value of all government policies and proposals. This is because it captures a comprehensive range of costs and benefits – such as leisure time, carbon emissions, culture and natural resources – that are not reflected in standard economic measures such as Gross State Product or average income. It also allows the comparison of the efficacy of initiatives across all government activities.

The purpose of this update to the Guide is to improve clarity, consistency, ease of use and update key parameters. The update also reflects current theory and practice that may have evolved since the last edition.

## Audience

The Guide is structured to accommodate a range of audiences:

- Chapter 1 provides an accessible overview of CBA for a general audience.
- Chapter 2 outlines the steps involved in completing a CBA, with some technical information. It will be useful for managers supervising CBA, analysts learning to undertake a simple CBA and experienced analysts looking for the specific expectations for CBA for NSW Government.
- The Appendices are reference documents addressing specific technical issues. They are intended to be an ‘as needed’ resource for analysts undertaking CBA.

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## Overview

- CBA is an evidence-based, systematic and comprehensive economic analysis that aims to measure the full impacts of government decisions on New South Wales, including economic, social, environmental and cultural impacts.
- The purpose of CBA is to support decision makers to enhance community welfare.
- The Guide establishes some mandatory requirements for CBA, which are clearly indicated. Most of the Guide consists of recommendations and guidance for best practice CBA.
- Where Governments face significant decisions, CBA can be a valuable tool for formulating initiatives prior to a business case or where a business case is not required.
- The scale and detail of CBA should vary with the scale and significance of the proposal for decision.

The Guide promotes a consistent approach to CBA of projects, programs, policies and regulations – referred to collectively in the Guide as **initiatives** – across the NSW Government. The Guide applies

to all General Government Agencies and non-commercial Public Non-Financial Corporations<sup>1</sup> – referred to in the Guide as **agencies**.

## Summary of Requirements

CBA is used in variety of contexts to inform development of initiatives and Government decision-making, such as grants programs and internal agency prioritisation processes. This Guide supports broad use of CBA but does not make it mandatory to undertake CBA in these situations. A separate agency or Treasury direction or policy may make CBA mandatory in some situations.

CBA is also used to evaluate initiatives after they have been implemented, known as ex post CBA. Treasury's [Policy and Guidelines: Evaluation \(TPG22-22\)](#) sets the expectations for when ex post CBA should be undertaken.

### Mandatory

#### When cost-benefit analysis (CBA) is required:

It is **mandatory** to undertake CBA when producing a business case to support a government funding or regulatory proposal.<sup>2</sup> CBA is thus required for capital, recurrent and information and communications technology (ICT) proposals with an estimated total cost of \$10 million or higher.

Note, this cost threshold is set by Treasury's [Submission of Business Cases \(TPG22-04\)](#).

#### Mandatory features of CBA:

CBA in business cases is required to:

- clearly and concisely define the problem, or opportunity, that the initiative is attempting to address, and how it will work
- define a base case and present CBA results relative to the base case
- assess at least two realistic options (in addition to the base case)
- estimate benefit-cost ratio (BCR) and net present value (NPV) results for the NSW referent group for each option
- use the central social discount rate set in the Guide (5 per cent real) to produce the central BCR and NPV results
- undertake sensitivity analysis on the BCR and NPV results for key risks and for the social discount rate sensitivities set in the Guide (3 and 7 per cent real)
- provide a distributional analysis of the initiative (this can be quantitative, qualitative, or a combination of both)
- include an 'executive summary' that summarises:
  - the intended purpose of the initiative
  - key features of each option and the base case

<sup>1</sup> In cases where Public Financial Corporations or commercial Public Non-Financial Corporations (e.g., State Owned Corporations) prepare business cases for consideration by Government, they should apply the Guide (see TPP18-05 Major Projects Policy for Government Businesses).

<sup>2</sup> Unless Treasury has agreed that cost-effectiveness analysis may substitute for CBA for a specific business case.

## Mandatory

- central BCR and NPV results for each option, including a breakdown of the value attributed to each key cost and benefit stream
- significant costs and benefits that could not be quantified and an estimate of their expected impact
- BCR and NPV results of key sensitivity analyses
- key risks and distributional impacts decision-makers should consider.

CBA produced for purposes other than business cases are subject to the same requirements, but agencies may make reasonable adjustments to reflect the purpose of the CBA. For example, in some cases, such as grant programs or an *ex post* CBA, it may be appropriate to assess only one realistic option.

## Key changes from previous edition

This Guide primarily makes incremental improvements to clarify and update previous guidance. Key changes include:

- The central real social discount rate has changed to 5 per cent from 7 per cent, with mandatory sensitivity analyses now at 3 per cent and 7 per cent.
- Mandatory requirements are clearly articulated and presented in one place, under 'Summary of Requirements'.
- The Guide now lists eight steps to CBA, rather than nine. The former ninth step, 'Undertake post evaluation', is presented alongside the eight steps to be clear that evaluation is a critical activity that is separate to *ex ante* CBA. The preceding eight steps have been re-organised for clarity and flow.
- Further guidance provided on carbon pricing and the need to account for carbon emissions, consider environmental impacts and consider climate risk in CBA.
- The benefit-cost ratio formula has been adjusted to reduce ambiguity in its application (Appendix 7).
- More detailed technical guidance has been developed on considering risk and uncertainty (Appendix 4) and distributional analysis (Appendix 5).

# 1 Overview of Cost-Benefit Analysis

---

## 1.1 What is cost-benefit analysis (CBA)

Cost-benefit analysis (CBA) is a holistic appraisal method that estimates the economic, social, environmental and cultural costs and benefits of an initiative and expresses them in monetary terms.

CBA aims to measure the full impacts of any government decision or action on the households, businesses, governments, non-government organisations and natural assets in a specified community, known as the referent group. In this Guide, the referent group comprises the residents of New South Wales.

CBA measures the costs and benefits attributable to an initiative relative to a business-as-usual situation without the proposed initiative. The business-as-usual situation is known as the base case.

It tallies up all the costs and benefits attributable to an initiative to estimate the net impact on social welfare. This impact is presented in benefit cost ratio (BCR) and net present value (NPV) estimates.

- BCR is the ratio of benefits to costs (i.e., benefits divided by costs).
- NPV equals benefits minus costs.

To **compare** costs and benefits, CBA uses a monetary (dollar) metric to place different types of costs and benefits on a common scale. Putting a monetary value on non-market items such as travel time savings, or the environment enables the comparison of costs and benefits across policy domains.

Crucially, CBA is not limited to counting outcomes that have financial impacts, produce measurable cash-flows, or contribute to Gross State Product. Nor does expressing an outcome's value in dollar terms imply that outcome could be (or should be) bought or sold. This Guide describes how both non-market and market impacts can be identified and valued in dollars.

Costs and benefits of initiatives occur over different time periods but need to be compared on an even footing. CBA uses a **social discount rate** to convert future costs and benefits into **present values**, that is the value of those things today. The social discount rate reflects the fact that a benefit now is worth more than one in the future, as monetary resources could be alternatively invested and accrue returns in the meantime.

Overall, a CBA reports whether the benefits of a proposal are likely to exceed the costs, and which option among a range of options is expected to result in the highest **net social benefit**. On this basis, CBA can be used to support Government in determining the initiatives that offer the best value for money for the community. In other words, CBA enables governments to assess which initiatives provide the greatest improvements in community welfare for a given investment.

Figure 1.1 illustrates these concepts through an example of a CBA results table, taken from the published business case summary for the Children's Hospital at Westmead Stage 2 Redevelopment.<sup>3</sup>

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<sup>3</sup> Business case summary published by Infrastructure NSW, available at: <https://www.infrastructure.nsw.gov.au/investor-assurance/business-case-summaries/>

Figure 1.1 – Example of CBA results: Children’s Hospital at Westmead Stage 2 Redevelopment

All values are incremental to base case, present value (\$2020-21 million)

	Option 1a	Option 4
Improved inpatient services	1,381.5	1,435.0
Improved cancer services	84.5	84.5
Car park benefits	5.5	5.5
Avoided operating inefficiencies	-	4.7
Residual value of assets	84.8	86.8
<b>Total benefits</b>	<b>1,556.2</b>	<b>1,616.5</b>
Capital costs	433.2	442.4
Operating costs	678.2	684.7
Repairs, maintenance and replacement costs	53.0	51.7
Life-cycle capital maintenance costs	21.2	21.2
<b>Total costs</b>	<b>1,185.5</b>	<b>1,200.0</b>
<b>Net present value (NPV)</b>	<b>370.6</b>	<b>416.5</b>
<b>Benefit cost ratio (BCR)</b>	<b>1.31</b>	<b>1.35</b>

The results in Figure 1.1 indicate that both options were expected to deliver a net benefit to New South Wales. The CBA pointed to Option 4 as being preferred because, while it was more expensive, it was expected to deliver a greater net benefit, both in absolute and relative terms and therefore represented better value for money.

## Features of CBA

Identifying and **forecasting** the impacts of an initiative often involves work by specialists in various fields. It is sometimes difficult to forecast or place monetary values on all impacts with confidence.

This Guide recommends **including all significant costs and benefits quantitatively and valued in dollars where possible** in the CBA result, drawing on the best evidence available and outlining assumptions and data limitations.

Where it is not possible to quantify potentially significant costs or benefits, they should be **described qualitatively** and reported in the CBA results section alongside the quantified results.



Even when impacts are difficult to quantify, CBA remains a systematic and valuable method for organising information.

**Distributional analysis** should be included in CBA reports to indicate which groups bear costs or receive benefits.

**Sensitivity analysis** tests the results of the CBA by varying key assumptions to reflect risks and uncertainties. It is a critical part of CBA.

---

## 1.2 How does CBA help decision makers?

CBA is an invaluable resource allocation tool because it allows decision makers to compare initiatives between portfolios on the same basis. Where there is a budget constraint and competing initiatives, CBA can help rank projects to maximise community welfare.

It allows decision makers to distribute resources to achieve the greatest welfare gain with the available funding – or, in other words, the best value for money. CBA can help decision makers by:

- clearly articulating the problem, or opportunity, the initiative is designed to address and presenting alternative solutions
- allowing systematic comparisons of the costs and benefits of different options to most improve social welfare
- scoping and shortlisting options in the early initiative development phase
- prioritising or ranking different options to meet an objective with constrained resources
- promoting consistency in decision making and the assessment of relative priorities
- enhancing transparency by using a consistent method that allows assumptions and scenarios to be tested.

CBA can provide decision makers with valuable insights when considering initiatives and help them to maximise community welfare in an environment of constrained resources. CBA also supports the comparison of alternative options to achieve an objective, or to **maximise community welfare in an environment of constrained resources**.

### Related guidance

This Guide forms part of the investment framework, a suite of Treasury policies and guidelines that supports Government to make evidence informed policy and investment decisions. This Guide should be considered alongside the:

- [NSW Government Business Case Guidelines \(TPP18-06\)](#)
- [Policy and Guidelines: Evaluation \(TPG22-22\)](#)
- [NSW Government Guide to Better Regulation \(TPP19-01\)](#)
- [Benefits Realisation Management Framework](#)
- [NSW Gateway Policy \(TPG22-12\)](#)
- [Outcome Budgeting \(TPP18-09\)](#).

While agencies have developed sector-specific CBA guidelines, often developed jointly with Treasury, this Guide sets the overarching, principles-based CBA framework. Agency- or sector-specific CBA guidelines provide additional methodologies and details, **in line with the principles in this Guide**, that are invaluable in the practical preparation of CBAs. Publicly available sector-specific CBA guidelines are listed in Appendix 10.

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## 1.3 When should CBA be used?

### Throughout the process of initiative development

CBA is valuable at all stages of initiative development. The process and discipline of CBA thinking helps to clarify problems and opportunities, establish the need for an intervention, identify stakeholders (beneficiaries or groups bearing costs) and define and compare options.

CBA is also recommended for high-risk initiatives not requiring a business case, for example a pilot project, and CBA may be valuable for developing strategies or programs.

### As part of business cases

CBA is a mandatory part of a business case, which is required for capital, recurrent and ICT proposals with an estimated total cost of \$10 million or higher.

Submission of Business Cases (TPG 22-04) sets out when a business case is required, and NSW Government Business Case Guidelines (TPP 18-06) establishes requirements and recommendations for producing business cases.

CBA is required in both strategic (pre-investment decision) and detailed (investment decision) business cases. CBA in a strategic business case typically contains a broader range of options and less detailed cost and benefit estimates. The CBA should then be updated at subsequent stages as more information comes to hand and the process move closer to an investment decision.

### Both before and after initiative implementation

CBA in business cases is typically *ex ante*, that is, undertaken before the initiative is implemented and therefore based on forecasts rather than observed results. This Guide is focused on the conduct of *ex ante* CBA.

CBA can also be conducted *ex post*, that is, after an initiative is implemented and using observed data (possibly combined with forecasts). *Ex post* CBA is a critical part of evaluation and is discussed in more detail, including when it should be undertaken, in Policy and Guidelines: Evaluation (TPG22-22). The principles of CBA are consistent between *ex ante* and *ex post* applications.

### After a case for change has been established

**A clear case for change should be identified before undertaking CBA.** The case for change clarifies the problem the intervention is designed to address and establishes the need to act, while the CBA compares the merits of different courses of action.

The case for change identifies the underlying community need (a problem or opportunity), or gap in current service provision, or regulatory arrangements, the initiative will address. It should be based on the need to resolve a market failure, address equity concerns or take a necessary action to achieve government objectives.

- Market failure is a situation where the private market fails to supply a socially optimal level of a good or service (discussed further in Appendix 9).
- Equity concerns include supporting disadvantaged groups.

- Objectives are expressed in State Outcomes and Premier’s Priorities, legislation, strategies, targets or election commitments.<sup>4</sup>

## For all types of initiatives

CBA is applicable to recurrent, capital, ICT and digital, and regulatory initiatives. Table 1.1 shows examples of a range of problems where CBA has been applied.

Table 1.1: General examples of applications of CBA

Infrastructure	Social programs	Recurrent expenditure	Policies and regulations
Transport: roads, railways, ports and airports	Health care: hospitals, mental health care	Public health programs; subsidies for medicines	Environmental regulations
Utilities: water supply, power	Vocational education and training places	Determining class sizes	Safety regulations: pharmaceuticals, foods
Communications: telephone, broadband	Early childhood programs	Random breath testing for vehicle drivers	Urban planning
Environment: renewable energy	Emergency services and disaster assistance	Location of government offices	Deregulation of taxis, food carts, e-scooters

## Cost effectiveness analysis as an alternative

In some circumstances, a cost effectiveness analysis (CEA) may be included in a business case in place of a CBA. CEA is a method of comparing the costs and benefits of different options that achieve the same outcome.

Because it is not possible to use this method to compare initiatives across different outcomes or policy areas, its use should be limited to cases where it is not technically possible to monetise the main benefits. The use of CEA should be discussed with Treasury on a case-by-case basis. CEA is discussed in more detail in Appendix 8.

## 1.4 Limitations of CBA

CBA is widely used by government, including in all the Australian States and the Commonwealth, the United Kingdom, European Union and New Zealand, as the first-best and preferred method to assess the merits of proposed government policies and public expenditure. As with any analysis, there are limitations to CBA.

<sup>4</sup> State Outcomes articulate the primary purpose for which public resources are invested. They are declared in the NSW Budget for each cluster (see Budget Paper No. 2 – Outcomes Statement). Premier’s Priorities represent the government’s key policy priorities and include targets against each priority (see <https://www.nsw.gov.au/premiers-priorities>).

There is no single, objective welfare function that can maximise outcomes for the whole community – values still play a critical role in government decision making. It is therefore important to acknowledge that CBA in isolation should not dictate Government decision-making or agency recommendations.

The impact of uncertainty, distributional analysis and significant unquantified costs or benefits should be considered within the CBA, and factors such as deliverability, financial and commercial considerations, resilience, fit with Government strategy and community expectations are considered by agencies and decision makers alongside the CBA (generally within the business case).

## Quantifying the full spectrum of outcomes

CBA aims to quantify all benefits and costs to the referent group in monetary terms to allow holistic comparisons. Treasury and agencies work together to continuously improve CBAs to capture a diverse range of outcomes.

In practice, it is challenging to quantify and forecast all outcomes. The established methodologies for CBA are more advanced and standardised (and sometimes more amenable to monetary valuations) for some types of outcomes than others. In some cases, a robust evidence base on the effectiveness of an initiative can exist without that evidence being easily transferrable to CBA results, for example, the mental health benefits of access to green space.

When it is not feasible to quantify and place a dollar value on an important cost or benefit, it should be **described qualitatively and presented in the CBA report** alongside the BCR and NPV.

## Distributional and equity concerns

CBA results are aggregated for the whole referent group, meaning BCR and NPV in isolation do not illuminate equity concerns and distributional impacts within the referent group. Including **distributional analysis** within the CBA transparently sets out which groups are impacted and how gains and losses are distributed between groups (see Appendix 5). Distributional analysis can be qualitative and can reference stakeholder experiences and community feedback for additional context.

## Resource intensive analysis

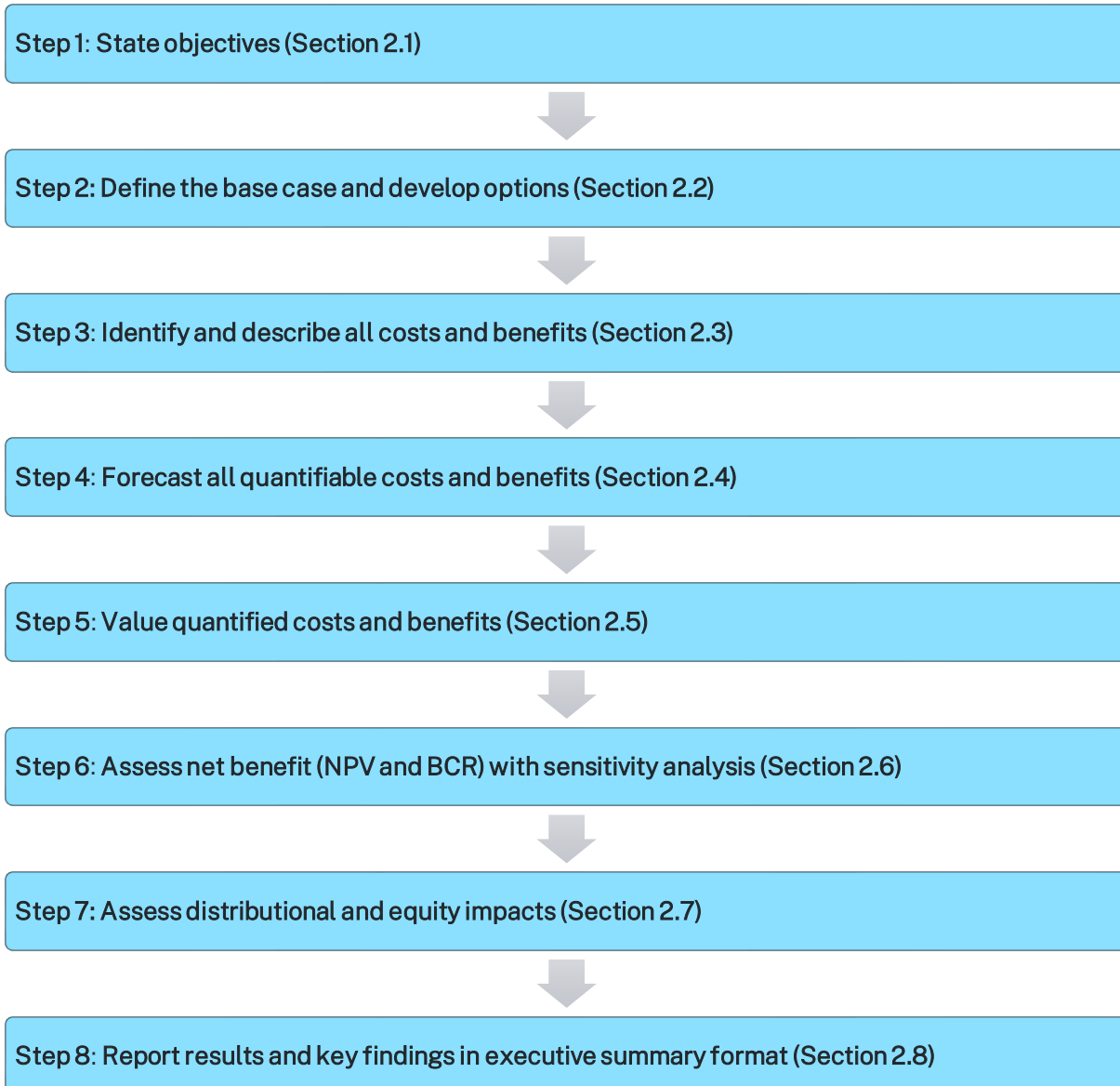
CBA can be a relatively data-intensive and specialised form of analysis that usually requires experienced CBA practitioners. Therefore, it is important that the level of detail in a CBA is **proportionate to the size, cost, strategic priority and risk of the initiative**, as well as the stage of initiative development (e.g., CBA to support an investment decision would be more detailed than CBA at the strategic business case stage).

A less detailed CBA may rely more on desktop research or not quantify minor benefits. Conversely, a more detailed CBA may undertake primary research, such as surveys or field interviews, or use more data-oriented modelling techniques.

## 2 Steps in cost-benefit analysis

Recommendation(s)
<ul style="list-style-type: none"><li>• Agencies preparing a CBA should follow the eight steps described in Figure 2.1.</li><li>• The steps are sequential. The process of completing a CBA may, however, involve iteration and feedback loops between steps.</li><li>• There is no required template for presenting a CBA, but it will often be useful to structure the CBA report in line with the recommended steps in this Guide.</li></ul>

Figure 2.1: Eight steps to undertaking a Cost-Benefit Analysis



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## 2.1 State objectives

The starting point for CBA is to specify the intended objectives and outcomes of the initiative. The objectives should flow from addressing the problem or opportunity identified in the case for change.

Objectives should be stated clearly in terms of welfare outcomes and not be tied to specific outputs.

- Examples of objectives in outcome terms: improve quality of life for people living with a chronic illness, reduce congestion in CBD, protect the natural assets and biodiversity in an area.
- Examples of objectives tied to specific outputs: deliver a particular medical procedure 1,000 times, build a new tunnel from A to B, plant X number of trees.

An initiative's objectives should demonstrate a strategic fit with Government's high-level objectives, typically shown through **alignment with State Outcomes, Premier's Priorities, legislation, strategies, targets or election commitments**.

Strong objectives will be broad enough to allow innovative option design but focused enough to support streamlined, efficient option design.

Revisiting the case for change may help to clarify objectives, as they will often be directly linked to the problem or opportunity the initiative is addressing.

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## 2.2 Define the base case and develop options

CBA needs to establish and clearly define:

- a realistic **base case** to be used as a comparator to the initiative options, and
- a range of **realistic options** to be assessed.

### Role of the base case

The benefits and costs of all options are calculated relative to the base case, i.e., the incremental change. Therefore, if the costs of all options exceed the benefits, then the base case is the strongest performing option.

Comparing options to a base case is necessary to isolate the outcomes directly attributable to the option. If we simply estimated gross outcomes over time after the option starts, we would mistakenly credit the option for delivering some changes that would have occurred anyway:

- Pre-existing trends and exogenous factors, such as population growth and climate change, will change outcomes over time whether the option goes ahead or not.
- Other initiatives may cause changes in the same outcomes the option targets. For example, the effect of a road safety education campaign on crash outcomes needs to be separated from the effect of unrelated road network improvements, or improvement in vehicle safety, by comparing to a base case that includes those improvements.

A well-established base case is the foundation for analysing the relative merits of options. An incorrect or loosely specified base case can bias the analysis of options:

- A base case that leaves out positive changes or adaptive measures likely to occur without an intervention may result in overstated option benefits.
- Alternatively, a base case that underestimates the potential for a problem to become more severe over time without intervention may understate option benefits.

## Defining the base case

CBA should compare the state of the world *with* each option against the state of the world *without* the option. **The base case is the projection of costs and benefits if none of the options proceed.**

The base case is a ‘business as usual’ situation. It assumes Government policies remain as they are and generally retains the *status quo*. That is, continuation of current quantity and quality of services including planned maintenance and usage. Table 2.1 describes some common features of base cases for different types of initiatives and Box 2.1 suggestions useful questions to ask in defining a base case.

Table 2.1: Typical base case characteristics

Initiative	Typical base case characteristics
Capital / infrastructure	<ul style="list-style-type: none"> <li>No new infrastructure built unless already funded and committed.</li> <li>Existing infrastructure maintained according to current funding commitments or at the minimum level to remain safe and operating.</li> </ul>
Recurrent	<ul style="list-style-type: none"> <li>Funded and committed programs continue.</li> <li>Programs required to meet legislative requirements should continue in the base case.</li> <li>Where there is uncertainty around funding or service delivery, there may be a need to rely on assumptions.</li> </ul>
Regulation	<ul style="list-style-type: none"> <li>Existing Acts, regulations and other instruments continue, subject to sunset provisions.</li> </ul>
Asset replacement	<ul style="list-style-type: none"> <li>May involve deferral of replacement and continued maintenance.</li> <li>End-of-life assets typically replaced (with a new asset of comparable standard) if required to remain safe and operating.</li> </ul>
System augmentation or expansion	<ul style="list-style-type: none"> <li>Continuation of the existing system or policies, including maintenance.</li> </ul>

### Box 2.1: Questions to ask when defining the base case could include:

- Will demand for the service grow or decline over time?
- Are any realistic adaptive measures or minor improvements likely to occur?
- Are there any currently underused assets in the system that could take on more usage?
- Is a significant investment required to keep the current system operating safely?
- What benefit streams will continue into the future? Will these grow or decline?
- How will longer term trends such as changing demographics or climate change affect assets, services or behaviours?



Other initiatives or policy changes that are **committed and funded** but have yet to commence should form part of the base case.

CBA of some long-term initiatives may need to make assumptions about initiatives that are not yet committed and funded to present a realistic future in the base case. These assumptions should be the minimum required to achieve a realistic base case, documented and tested through sensitivity analysis.<sup>5</sup>

When defining the base case, analysts should take care to ensure that:

- important assumptions are clearly documented
- all relevant costs and benefits are included in the base case
- costs are directly related to current policy settings
- evidence is provided for benchmarks, assumptions and forecasts that underpin the base case.

In rare instances where the base case is highly uncertain and difficult to specify, it may be necessary to specify more than one base case.

## Level of investment in the base case

Some base cases can be described as a:

- ‘spend nothing’ scenario: no further investment is expected, e.g., a recurrent program with time limited funding is coming to an end with no legislative requirement or Government commitment to extend or replace it.
- ‘do minimum’ scenario: there is a commitment to or unavoidable need for some further investment to maintain current service standards, keep services or infrastructure safe and operational, or meet legislated requirements, e.g., replacing unsafe roofing and windows in a building.

Generally, a ‘do minimum’ level of investment is a **more plausible base case for a wide range of initiatives** than a ‘spend nothing’ (or ‘do nothing’) scenario.

## Options

CBA should canvass a range of realistic and feasible options. This Guide requires CBA to assess at least two options (in addition to the base case). The challenge is to specify and shortlist a realistic range of options to meet the outcome-based objectives defined in Step 1.

Developing robust, feasible and innovative options often involves a combination of research, evaluations and lessons learned from previous initiatives, expert workshops, and stakeholder engagement. Stakeholder engagement is key to understanding the lived experience and perspectives of people who will be impacted by the initiative.

A broad range of options should be identified at the earliest possible stage of the initiative development process:

- Each option should deliver on the objectives.
- Options may vary in the extent to which they deliver.
- For example, one option could represent a ‘minimum viable product’ that meets the objectives to the lowest acceptable standard at the lowest feasible cost.

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<sup>5</sup> For example, Infrastructure Australia’s assessment framework states ‘the base case should not include investment which is either complementary to or a major substitute for the project being analysed’. (Infrastructure Australia, 2021, Guide to economic appraisal, p19).



- Another option could be designed to meet all objectives at the highest standard.
- Additional options could fit ‘in between’ these two extremes.

Some examples of options include:

- For capital initiatives: building a new asset, refurbishing existing facilities, postponing or bringing forward an investment, non-build options, demand management to reduce or avoid the capital expenditure, increased maintenance, improvements to resilience or leasing instead of owning an asset.
  - The Guide recommends a non-build option (or options) is assessed at the short list stage wherever practical.
- For recurrent initiatives: service reduction, expansion or redesign, starting delivery of a new service.
- For regulatory initiatives: encouraging or discouraging certain behaviours of households (e.g., cigarette plain packaging) and private businesses (e.g., innovation in point-to-point transport), industry self-regulation, codes of conduct, or information provision.

Options should be carefully specified, including scope, implementation timetable, cross-agency impacts, capital or operational requirements, and key assumptions driving the costs and benefits.

Some useful questions for generating options could include:

- Variations in scale or scope: could the option be smaller or bigger, combined with other programs, provide different service quality or resilience characteristics, use different materials, re-purpose existing assets, have a different design life, or entail a different method of procurement?
- Demand-side measures: could existing services be better rationed using behavioural ‘nudges’, pricing or eligibility criteria?
- Supply-side measures: could private businesses, workers or markets be incentivised or supported to deliver a solution?
- Site selection: what alternative locations are possible?
- Alternative time paths: could the operation be deferred or undertaken in discrete stages?

Assessing a deferral option is particularly important for options with long-distant benefits.

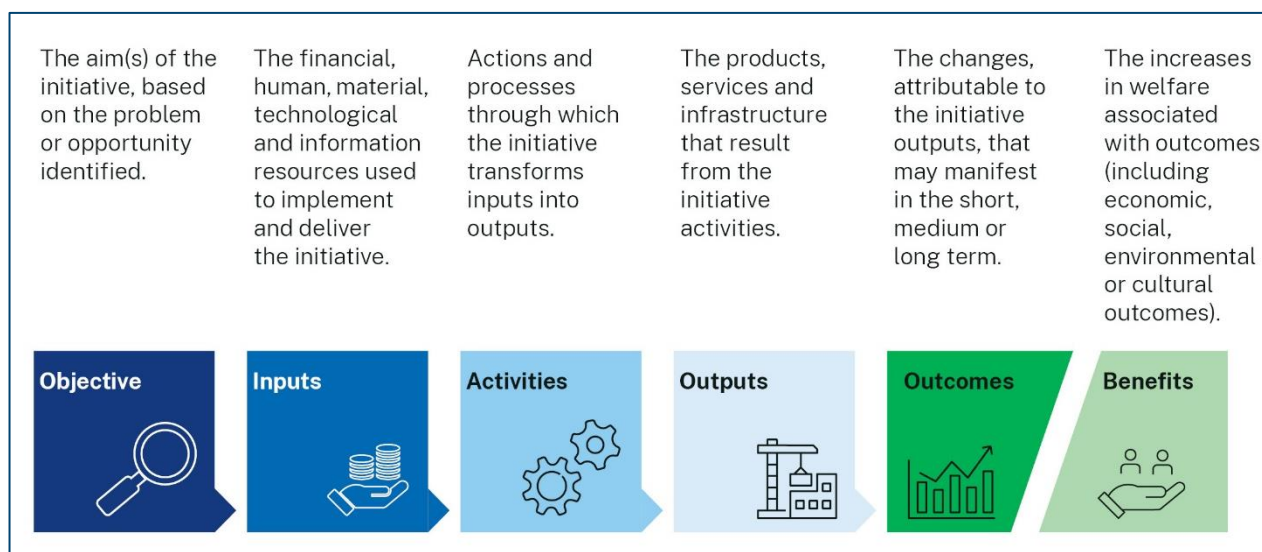
## Logic model

Agencies should undertake a logic model analysis as part of the initiative development process (e.g., as a step in the business case process) and **this Guide recommends using the logic model to help build the CBA.**

Logic models describe the links from the initiative’s objective to the inputs, activities and outputs it will produce, to the outcomes it is targeting. They provide a robust, logical explanation of how an option will deliver on its objectives.

Logic models can take several forms and are adaptable to the needs of the analysis. Figure 2.2 provides a simple suggested structure. [Policy and Guidelines: Evaluation \(TPG22-22\)](#) provides further guidance on developing a logic model.

Figure 2.2: Typical Logic Model



## Options at the different stages of initiative development

The number and nature of options assessed in CBA will vary as the development of an initiative progresses from strategic consideration to an investment decision – starting out very wide and narrowing as analysis is refined. Table 2.2 provides high-level guidance on options development and assessment at each stage.

Table 2.2: Breadth of options at different stages of initiative development

Stage	Options development	Options assessment
Problem definition Business case stage: Problem definition (Stage 0) Options list: unconstrained list or 'very long' list	<p>With clear objectives and problem definition, initiative development can begin with an unconstrained list of all possible solutions.</p> <p>This list should be filtered down to a long list of options to be analysed through CBA in the next stage.</p> <p>This Guide recommends that the unconstrained list of options and the filtering process is documented in the next stage CBA.</p>	<p>Filtering from the unconstrained list to the long list should use a <b>transparent</b> and repeatable method of the agency's preference.</p> <p>Agencies may find it valuable to produce a simplified CBA or CEA or use techniques such as multi-criteria analysis or strategic merit tests.</p>
Analysis / development phase Business case stage: Strategic Business Case (SBC) Options list: long list	<p>The long list of options should provide distinct alternatives to meet the objectives.</p> <p>In many cases, this should include some (usually cheaper) option/s that <b>partially</b> meets the stated objectives.</p> <p>This Guide suggests the long list for an SBC CBA includes three to six options.</p>	<p>CBA should be used to refine the long list of options down to a short list that will be considered for funding.</p> <p>CBA at this stage may also identify the agency's preferred option, but this preference must be open to genuine review in the DBC.</p> <p>The lower level of detail and rigour in an SBC CBA may mean it:</p>

Stage	Options development	Options assessment
		<ul style="list-style-type: none"> <li>• does not quantify (but does identify) minor benefit streams</li> <li>• uses costings with a wider margin of error</li> <li>• replaces some finer, unfinished details of options with assumptions.</li> </ul>
Investment decision Business case stage: Detailed Business Case (DBC) Options list: short list	<p>The short list of options is made up of refined, well-developed versions of the highest-ranked options from the long list.</p> <p>CBA in a DBC must assess a minimum of two realistic options and is unlikely to assess more than three options.</p> <p>For some DBC, it will be appropriate for the options to be variations on the preferred option from the SBC in scope, scale and timing.</p>	<p>The full short list of options should be subject to a detailed, transparent and rigorous CBA. This is the standard of evidence required to support an investment decision.</p>

## Early and genuine partnerships with First Nations communities

Agencies developing CBA for initiatives that have impacts on First Nations communities should work in partnership with them to ensure that:

- impacted First Nations communities understand how the initiative may impact their wellbeing
- legal rights and interests of First Nations people and communities are identified accurately and reflected in the base case, particularly where initiatives have impacts on land use, planning and environment or land ownership
- all potential impacts on First Nations legal rights and interests are reflected in analysis of options – including benefits, costs, and risks.

Where issues are identified, agencies should work in partnership with First Nations communities from the earliest stages of the business case and CBA process, to:

- define opportunities and problems and potential options to respond to them
- understand what First Nations legal rights and interests are impacted
- get input on problem definition and scope of options.

For CBA with land use and land ownership impacts specifically, the value of land for First Nations communities may not be reflected fully in standard metrics (such as land-value uplift or higher-value land use), so there should be significant engagement with First Nations communities to identify the way they may be impacted by an initiative.

Treasury recommends that agencies preparing CBAs for initiatives impacting First Nations people and communities consult the Centre for Evidence and Evaluation and First Nations Economic Wellbeing Branches in Treasury prior to commencing.

## Climate risk

The climate in New South Wales has already changed, with extreme weather events becoming more frequent and intense. Climate change can impact on the expected costs and benefits and resilience of an initiative. Impacts can be driven by events (acute shocks), or longer-term shifts (chronic stresses) in climate patterns.

To better enable rigorous decision-making, the risks and impacts of climate change should be incorporated into CBA, where possible.

Initiative options (and base case projections) should appropriately reflect the risks posed by climate change, for example by:

- considering where assets or service demands are affected by climate conditions, or are potentially exposed, or in the future will be exposed, to climate-related natural hazards such as flooding or bushfires
- setting out the extent to which investments are targeted to withstand climate change risks and remain operable and resilient to likely natural hazards
- appropriately valuing options that deliver climate change risk mitigation, for example reducing natural hazard risks
- incorporating carbon emissions impacts and future transition costs into options development.

The [Climate Risk Ready NSW Guide](#) provides resources and guidance on understanding, planning for, and adapting to, climate change impacts.

## ‘Real options’

**Real options** involve making a choice or investment up-front that confers the ability, but not the obligation, to do something in the future. They provide flexibility in response to uncertainty. For example, when building a two-lane road, we could choose to reserve a corridor of land big enough for a four-lane road. This would give us the real option to expand the road to four lanes in the future.

Thinking about real options early in the options development stage can add significant value to CBAs for long-lived or staged initiatives, as well as initiatives exposed to significant uncertainty. Real options are discussed further in Appendix 4.3.<sup>6</sup>

## Iteration and Appraisal

Repeated analyses are often needed to develop, refine and short-list options – especially for major expenditure proposals.

Pilot testing an option can be valuable to gather data, test the effectiveness of an initiative and refine option design prior to full roll-out. An option could be selected for a pilot program based on a preliminary analysis, with subsequent wider roll-out informed by evaluation of the pilot and an updated CBA of the full program.

In some cases, approval for an initiative should occur in stages over a long procurement period. The CBA should be progressively updated as options are refined to ensure it still makes sense to proceed.

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<sup>6</sup> See also published guidance on real options from Australian Transport Assessment and Planning (<https://www.atap.gov.au/sites/default/files/documents/atap-t8-real-options-assessment.pdf>) and the Victorian Department of Treasury and Finance.

## Options for provision on commercial terms

Where an initiative proposes to provide goods or services on commercial terms, the CBA should provide information on the proposed pricing strategy and consider how this will affect costs and benefits (e.g., demand, distribution of costs and benefits). This applies whether the asset will be publicly or privately owned. Treasury's [Guidelines for Pricing of User Charges \(TPP01-02\)](#) provides guidance on setting charges.

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## 2.3 Identify and describe all costs and benefits

After the base case and options are established, the next step is to identify the full range of costs and benefits attributable to each option over the life of the initiative. Recall, CBA captures the *incremental* costs and benefits of an option relative to the base case.

### Identifying benefits

Benefits are an increase in welfare associated with an initiative's economic, social, environmental and cultural outcomes. Benefits can be monetary or non-monetary and an initiative's key benefits should flow directly from meeting its objectives.

An increase in welfare means the benefit can be described from the perspective of the beneficiary as a **surplus**. That is, they are getting out more than they put in. For example, if a business spends three dollars making a coffee, including paying the owner the opportunity cost of their time, and sells the coffee for four dollars – the benefit of the sale to that business is one dollar. If the coffee sold for three dollars, there would be no benefit from the business's perspective.

CBA aims to capture all the benefits attributable to an initiative, including non-market benefits such as travel time savings, reduced carbon emissions and environmental amenity. Benefits can generally be included in CBA if they meet each of the following criteria:

- They are attributable to a change **caused** by the option and would not occur in the base case.
- They accrue to NSW households, businesses, governments or non-government organisations (including environmental benefits).
- They are not purely a transfer between NSW parties, i.e., one party loses by the same amount another party gains (see Appendix 3.6 for detailed discussion, including treatment of government grants and vouchers, which should generally be treated as an expenditure)
- There is evidence to support each of these claims.

For practical purposes, the benefits included in CBA should generally also be:

- significant, either in absolute size or impact on a particular group
- measurable.

Agencies should also take care to ensure different benefit categories are not reflecting the same outcome (known as '**double counting**'). For example, one benefit of a software upgrade at a government agency could be time savings for workers completing a routine task. If we then also counted the benefit of the productive activities workers undertake with their new free time, we would be double counting the benefit of the efficiency gain from the software upgrade. In this example, both benefit measures may be valid, but the CBA should only count one of them.

Table 2.3 sets out examples of costs and benefits for some initiative types.

Table 2.3: Examples of costs and benefits in select initiatives

Example	Category	Direct impacts	Indirect impacts
Roads	Costs	Construction costs Maintenance costs	Noise, air pollution and lower amenity around new road
	Benefits	Travel time savings Lower vehicle costs Reduced accidents Reduction in emissions	Savings in travel time, vehicle costs and accidents on other roads
Education	Costs	Cost of delivering education services Student costs: income foregone and out-of-pocket expenses	-
	Benefits	Benefits to students: increased future productivity and earnings	Benefits to employers from higher productivity Reduction in crime and other social costs
Court Infrastructure	Costs	Construction costs Maintenance costs Operating costs	Disruption costs during construction
	Benefits	Reduced court delays Avoided capital, operating and maintenance costs	Placemaking benefits (e.g., urban cooling effect)

Common benefit categories for regulatory initiatives may include:

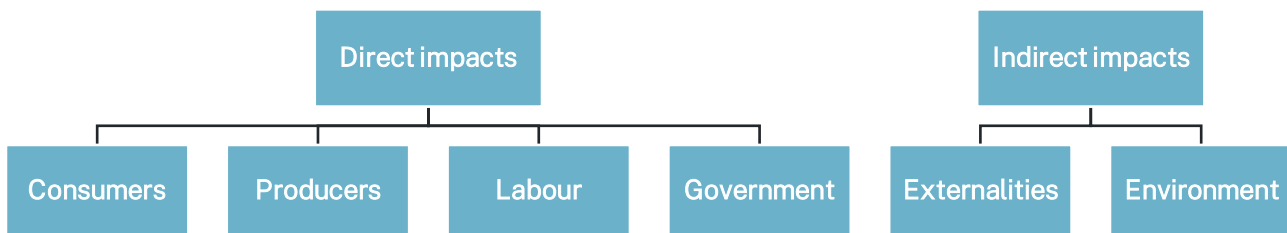
- improvements in product and service quality
- improvements in public health and worker safety
- improvements in environmental amenity
- reductions in compliance costs for businesses and administrative costs for government.

## Categories of costs and benefits

To help analysts systematically identify costs and benefits, they can be classified as direct or indirect impacts and differentiated by the group impacted (see Figure 2.3).



Figure 2.3: Possible costs and benefits – classifying impacts



## Direct and indirect impacts

**Direct impacts** are primarily impacts on producers (e.g., businesses) and consumers (e.g., households) of goods or services associated with the initiative. Goods and services could be a market good like electricity or a non-market good like a public park, education or healthcare.

**Producers**, both public (i.e., government businesses) and private, bear the costs of projects or policies. Producers may also obtain benefits from increased output or lower cost inputs that result in changes to profit. Profit is also known as producer surplus in CBA.

For **consumers** (which includes users of free goods or services), **private use values** are usually the most important value. This represents the value that individuals, households, communities or businesses gain from Government services or policy settings. **Private use value is equal to the amount consumers are willing to pay for their own use of the good, service or amenity.**

Consumers may also attribute other values to outcomes, namely option, altruistic or non-use values:

- **Option values** occur when individuals value goods, such as cultural venues, not just for their expected use but also for their possible use.
- **Altruistic values** occur when individuals are willing to pay for someone else’s use of a good or service, including use by future generations.
- **Non-use values** occur when people value a good, such as biodiversity, simply for its existence, independently of any use value.

For **workers** (labour), an initiative may impact their employment (e.g., an underutilised worker may have more work opportunities) or result in increased or decreased wages.

For **government**, direct impacts could include savings from avoided costs or revenue gains. Government incurs the resource costs required to provide assets or services to the community. These resources include produced capital (machinery), natural capital (land and ecosystem services) and human capital (labour’s know-how).

**Indirect impacts** are impacts on third parties (households, businesses, non-government organisations or the environment) not directly involved in the consumption or production of the primary good or service. There are two forms of indirect impacts:

- **Externalities:** impacts on third parties as a result of production or consumption, usually in the primary market. For example, power generation may create negative externalities in the form of air pollution and carbon emissions that affect third parties. Initiatives may also impose costs by depleting social (e.g., disruption to existing communities or green space) and cultural capital (e.g., impacting culturally significant sites). Investment in education may create positive externalities by reducing crime and other anti-social behaviour that would affect third parties.
- **Related markets:** impacts on businesses in **complement and substitute markets** of the goods and services involved in the initiative. For example, an initiative that re-stocks a lake with fish for recreational fishers may result in the local fishing supplies store increasing its producer surplus

due to extra demand (complementary market). On the other hand, the nearby golf course may suffer a reduction in demand to play, which reduces their surpluses (substitute market). If prices in the related markets are efficient, then complementary and substitute market effects can be safely ignored, as all else being equal, the primary market will capture all relevant changes to welfare.

Indirect impacts often take the form of **environmental impacts**, for example changes in tree and vegetation cover, waterway health, pollution, soil conditions, carbon emissions, biodiversity, and animal habitats. Environmental impacts may be unintended and not obvious and may reach beyond the physical location of the initiative.

**Direct and indirect impacts, where they are relevant, should be forecast and valued** as changes relative to the base case.

### Multiplier impacts are excluded from CBA

Multiplier impacts (also known as second-round impacts) are the flow-on impacts from increases or decreases in income as they circulate through the economy. For example, if an initiative results in 100 workers' incomes increasing by \$10,000, then those workers will spend some of that extra income at businesses. Those businesses might generate extra profits and hire extra workers, and then those workers will spend their extra income at other businesses and so on. This is known as a **multiplier effect**.

**Benefits from multiplier impacts are not included in a CBA.** Estimates of multiplier impacts are highly variable and contestable and generally do not consider second-round costs. Including multiplier impacts in CBA would also require calculating them for the base case, as the costs of the initiative could otherwise have been spent elsewhere in the economy, where they also would have generated multiplier effects. It would be inaccurate to attribute a multiplier income benefit to the initiative and ignore the possible multiplier benefits of the same expenditure on an alternative project.

### Reporting results for alternative referent groups

CBA should include costs and benefits to the NSW community (the referent group). Decision makers may, however, also require local level, cross-border, or national analysis. **Where the CBA includes local or interstate impacts, these should be shown separately from impacts on New South Wales.**

For example, a CBA for coastal management could supplement the results for the overall NSW community with separate analysis of the impacts on the local community. This can help to highlight the **distribution** of costs and benefits within the local area, while also showing the overall results for New South Wales.

CBA with an Australia-wide referent group may also be required for an initiative seeking Commonwealth Government funding (particularly where the Commonwealth Government is seeking initiatives with multi-state impacts). If one business case is being prepared for both NSW Government and the Commonwealth Government, then the CBA results for New South Wales-only and Australia-wide should be reported.

### Common benefit categories

Table 2.4: Common benefit categories

Item	Description
<b>B1. Savings or avoided costs</b>	Expected reductions in public or private expenditure due to an initiative.



Item	Description
	This could be due to improved efficiency or reduced need for future services (e.g., an early intervention program reducing the future need for acute health, education, community or justice services).
<b>B2. Government revenue</b>	Incremental extra revenue to the NSW Government resulting from the initiative that would not be realised in the base case.  Generally included only when extra revenue is raised from non-NSW parties, as fees or taxes paid by NSW residents would be a transfer (from the payer to the Government) rather than a cost or benefit.
<b>B3. Consumer surplus</b>	When a consumer receives a good or service at a lower price than the maximum they are willing to pay. Initiatives that improve a service may increase consumer surplus.  For example, travel time savings, improved green or public space, improved theatre or museum offerings.
<b>B4. Producer surplus</b>	When the price that a producer receives for a good or service is greater than the cost of production.
<b>B5. Labour surplus</b>	When a worker's actual wages are greater than the minimum they are willing to accept to do the job (i.e., their reservation wage).
<b>B6. Benefits to the broader community</b>	The benefits of public services, such as emergency services, health and education services, and public transport, that flow to the community as a whole rather than to the users of the services only. For example, public transport can generate lower pollution and reduced congestion.  These benefits accruing to third parties are known as positive externalities.  Note: when a price is charged for a public service, but that price does not reflect the full value of positive externalities, the price alone will not reflect the full benefits of the service.
<b>B7. Residual value</b>	When an asset still has value at the end of the CBA analysis period. This could be because the asset is still producing benefits or because it can be resold.

Some initiatives aim to improve the resilience of a system to the impacts of adverse events (e.g., improved ability of infrastructure to operate following a natural disaster) or reduce the risk of an adverse event occurring or both. The benefits stemming from these outcomes can often be categorised according to Table 2.4.

Note, an initiative may cause both positive and negative changes in the benefit categories in Table 2.4. For example, an adjustment to a bus route may improve the travel experience (increase consumer surplus) for most bus users but be less convenient (reduce consumer surplus) for a few. In such cases, CBA measures the **net change** in benefits from the initiative.

## Common cost categories

Table 2.5: Common cost categories

Item	Description
<b>C1. Capital costs</b>	Examples include: <ul style="list-style-type: none"> <li>capital costs of new assets</li> <li>capital costs of asset replacements</li> <li>major periodic maintenance or refurbishment costs.</li> </ul>
<b>C2. Recurrent costs</b>	Examples include: <ul style="list-style-type: none"> <li>agency salaries or wages and labour on-costs</li> <li>accommodation expenses</li> <li>operating and maintenance costs, including subcontracted external labour or rented capital.</li> </ul>
<b>C3. Regulatory costs</b>	Examples of possible costs of regulatory proposals include: <ul style="list-style-type: none"> <li>administrative and compliance costs for regulated entities</li> <li>cost to government agencies in administering the regulation</li> <li>reduced consumer surplus from restrictions on competition or choice</li> <li>restrictions on innovation that reduce potential consumer surplus</li> <li>delays that impose holding costs on businesses.</li> </ul>
<b>C4. Ancillary</b>	Examples of ancillary costs include: <ul style="list-style-type: none"> <li>transaction costs</li> <li>costs of remediation</li> <li>relocation, temporary accommodation and other disruption costs. For example, disruption to businesses during construction.</li> </ul>
<b>C5. Costs to the broader community</b>	Third party costs on the community or groups within it. Examples of third party costs, known as negative externalities, include noise, congestion, pollution, carbon emissions and reduction in visual amenity.

## 2.4 Forecast all quantifiable costs and benefits

The next step in estimating costs and benefits is forecasting the volume or quantity of outcomes, for example:

- number of additional passenger trips on a bus route
- number of tenants moved from the waitlist into social housing
- average increase in student test scores
- decrease in probability of developing diabetes.

**Volume or quantity of outcomes can be forecast using a variety of techniques and approaches** depending on the data available and the unique characteristics of the proposal. See Appendix 1 for further discussion on forecasting methods and issues.

For example, estimates of costs for infrastructure projects require forecasts of the scope and schedule of works and quantities of land, labour and materials required. These estimates are often sensitive to project design and technology, which may change as the project matures, and in-ground conditions.

Costs and benefits often accrue at different times over the life of an initiative. Forecasts should consider when costs and benefits start, finish, peak and/or trail off and whether there is expected to be a 'ramping up' period (e.g., where a benefit starts out small as users learn about a new service and picks up to its full level after a few years).

Forecasts should also consider the potential for changing external circumstances to impact outcomes, both for the base case and options. For example:

- Climate change and increased frequency of extreme weather events may impact the effectiveness, resilience and maintenance needs of infrastructure.
- The unanticipated acceleration in working from home due to the COVID-19 pandemic may affect travel patterns and subsequent demand for transport options.

## Approach to forecasting

Predicting the future is unavoidably challenging – especially for novel initiatives. Ideally, analysts can draw on evaluation of previous, similar initiatives. Where this is not possible, analysts need to use their judgement to build a forecast from a combination of:

- *ex post* evaluation on the impacts of somewhat comparable initiatives
- relevant and valid literature estimating effect sizes
- parameters and approaches used and validated in previous *ex ante* CBA
- generic economic parameters such as elasticities or growth rates, and
- expert opinion (published opinions or experts consulted for the initiative).

In all cases, transparency is key. Analysts should make their assumptions and uncertainties transparent, both in presentation and when applying methods to account for uncertainty.

Additional technical expertise may be required to forecast outcomes and behaviour changes, for example, a potential reduction in water quality or number of trips on a toll road. This work is often undertaken by specialist subject matter experts and should be subject to **independent peer review** given the specialist nature of this work and the significant scope for weak assumptions or errors.

Peer review can also help counter optimism bias, an important consideration discussed in Box 2.2.<sup>7</sup>

### Box 2.2: Optimism bias

**Optimism bias** is a cognitive bias that results in people systematically underestimating the likelihood of negative events occurring. Planning fallacy is a related bias that results in over-optimistic projections of how smoothly a planned project will run.

In CBA, optimism bias can result in overstating benefits and understating costs, overly optimistic demand projections or underestimation of the impact or likelihood of downside risks. Empirical research suggests unchecked optimism bias can have a significant impact on the reliability of CBA estimates.

Recommended steps to address optimism bias include:

- soliciting an ‘outside view’ of the analysis, for example through independent peer review
- undertaking sensitivity analysis on a realistic ‘worst-case scenario’ with lower benefits and higher costs
- where data is available, adjusting forecasts based on the forecast errors of past initiatives (this technique is known as reference class forecasting discussed further in Appendix 1).

Forecasting is often undertaken in a spreadsheet setting out the data inputs, assumptions, methodology and outputs (potentially including charts, tables and other figures). It is essential the model apply good practice to be transparent and able to be reviewed. A copy of the forecasting spreadsheet model should accompany the CBA report for reviewers.

## Qualitative costs and benefits

Quantified costs and benefits are a key output of CBA, but in some cases quantification may not be practical. **Impacts that cannot be quantified should still be accounted for qualitatively.** A list of significant qualitative factors should be recorded in the CBA to inform decision makers, including the direction of the impacts and their likely significance.

## Analysis period

The analysis period defines the start and end date of a CBA. **It should be long enough to capture all significant costs and benefits of the initiative.** Generally, this means the analysis period should match the expected economic life or design life of the initiative.

The analysis period should begin in the first year that funds are expended on implementing the initiative (or the first year regulation comes into force). Note, costs and benefits in the very first year of the analysis period are not discounted. The first few years of the analysis period for many options will cover an implementation, delivery or construction period before the initiative is operational.

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<sup>7</sup> See, for example, Flyvbjerg Band Bester DW (2021) ‘The cost-benefit fallacy: why cost-benefit analysis is broken and how to fix it’, *Journal of Benefit-Cost Analysis*, 1-25.

If the benefits or costs are expected to persist after the initiative has ceased operating, then the analysis period should be appropriately extended.<sup>8</sup> **The Guide suggests possible analysis periods in Table 2.6, but these are not mandatory.**

As the analysis period gets longer, forecasting becomes more uncertain. Extending the analysis period past 60 years is only likely to be valuable if one of the **primary** benefit categories cannot otherwise be captured. For example, it may make sense for initiatives primarily concerned with very long-term outcomes, such as climate change, to use analysis periods of 60 to 100 years.

Table 2.6: Suggested analysis periods by initiative type

Type	Suggested analysis period
Capital	<ul style="list-style-type: none"> <li>• <b>30-60 years</b> post-construction for most capital infrastructure types.</li> <li>• For assets with a long life, a residual value may need to be calculated (see Appendix 3.1).</li> </ul>
Recurrent	<ul style="list-style-type: none"> <li>• Match analysis period to the life of the initiative or the duration for which funding is requested.</li> <li>• Often <b>1-20 years</b> based on known ends dates including associated funding commitments.</li> </ul>
ICT	<ul style="list-style-type: none"> <li>• Often <b>2-5 years</b> and likely no longer than 10 years considering the short product lifecycle in ICT.</li> </ul>
Regulation	<ul style="list-style-type: none"> <li>• Long enough to capture all incremental impacts depending on the nature of the regulation.</li> <li>• Often <b>5-20 years</b>, depending on the nature of the regulation and how long it is likely to remain in force until reviewed.</li> </ul>

## 2.5 Value quantified costs and benefits

The starting point for valuation is establishing a standard unit of measure. Valuation in CBA uses Australian dollars in real terms (i.e., excluding inflation). This is also known as constant dollar terms.

### Willingness to pay

**The core valuation principle is that goods, services and non-market outcomes are valued at the dollar amounts that individuals or businesses are willing to pay for them.**

The preferences of individuals and businesses are the primary indicators for valuations. CBA valuations aim to estimate how much value people place on a given outcome relative to other outcomes. For non-market outcomes, CBA does this by estimating the dollar amounts that the relevant parties would be willing to pay for the outcome in a hypothetical world where it was for sale.

<sup>8</sup> Benefit streams that accrue for many years after an initiative ends (e.g., future lifetime earnings uplift for school students or long-term health benefits from prevention) can be summed up and discounted to a present value using the central discount rate and included as a lump sum in the final year of the analysis period. The lump sum will then be discounted back to the start year in the final NPV and BCR. This can avoid the need for extremely long analysis periods while achieving the same results.

The underlying assumption is if we're willing to give up more of our income for Outcome A than for Outcome B, then we gain more benefit from Outcome A. While these valuations are not a precise science, they represent a consistent and highly adaptable methodology with sound theoretical underpinnings.

## Opportunity cost

**The costs of resources in CBA are based on the principle of opportunity cost.** In a competitive market, market prices reflect the value of resources in alternative uses. Most markets for goods and services in New South Wales are largely competitive and, as a result, market prices tend to reflect the value of resources used in production.

Generally, CBA should use market prices to value the resources procured by Government as inputs to an initiative (like labour and materials). There may be situations, however, where market prices need to be adjusted for taxes or subsidies, regulated prices or lack of competition.

## Non-market valuations

Applying the valuation principles of willingness to pay and opportunity cost is challenging when market prices are poor indicators of value – especially for goods and services that aren't bought and sold in a market (non-market goods).

For outcomes that do not have a clear market price, there is a range of alternative approaches that can support valuations (see Appendix 2 for further discussion and guidance), such as:

- Revealed preference: valuing the non-monetary resources people actually expend to achieve an outcome.
- Stated preference: using survey data to elicit willingness-to-pay estimates directly from consumers or stakeholders.
- Linking a difficult-to-value outcome to another outcome that can be valued: e.g., a student completing Year 12 can be linked to that student earning a higher income later in life.
- Avoided costs to Government: some outcomes reduce the future need for Government to provide support services, e.g., improved mental health outcomes may reduce the later need to access health services or interact with the justice system.
- Replacement costs: e.g., avoided flood damage.
- Well established proxy measures: e.g., quality adjusted life year (QALY), travel time savings.
- Hedonic analysis: e.g., discerning the value of green space by measuring uplift in nearby property prices (a form of revealed preference).

## Valuations in practice

Costs and benefits that do not receive a valuation (that is, have their value expressed in dollars) cannot be included in the BCR and NPV results. Decision-makers should be encouraged to consider the impacts of unquantified costs and benefits where their existence is well-supported by evidence, and they are sufficiently large to influence the decision.

Nonetheless, accounting for costs and benefits in quantitative CBA results (BCR and NPV) facilitates consistent and efficient resource allocation decisions and **this Guide recommends valuing all significant costs and benefits whenever possible** (see Box 2.3). Table 2.7 discusses approaches to valuation under different circumstances.

### Box 2.3: Evidence to support valuation

All significant benefits should be valued, provided they can be attributed to the initiative and the forecast quantities are supported by reasonably robust evidence. The valuation step is critical to produce numerical CBA results.

Valuations should be based on the **best evidence available**, with the effort devoted to collecting evidence proportional to the significance of the cost or benefit stream. In many cases, valuation evidence for non-market benefits will not be definitive and analysts will have to use judgement to reach a transparent and defensible conclusion. A reasonable ‘margin of error’ around this valuation should then be tested in sensitivity analysis.

This Guide recommends expressing the value of costs and benefits in dollars even where evidence to support the valuation is non-definitive, as long as:

- thorough literature review has been undertaken to support the best benefit transfer possible
- parameters and findings from literature have been used accurately and appropriately, and
- the CBA clearly communicates key risks and uncertainties in the final results stemming from valuation challenges.

Table 2.7: Approaches to valuation in different circumstances

Type of valuation	Examples	Treatment
Quantity (volume) estimate, and unit prices are available	<ul style="list-style-type: none"> <li>• Additional electricity supplies to users.</li> <li>• Capital expenditure.</li> <li>• Operating costs.</li> </ul>	All major costs and benefits should be included quantitatively in CBA result.
Quantity can be estimated, but hard to value in monetary terms	<ul style="list-style-type: none"> <li>• Museum visits.</li> <li>• More play space in a school.</li> <li>• Easier access to green space.</li> <li>• Carbon emissions.</li> </ul>	<p>Minor costs or benefits can be described qualitatively.</p> <p>Significant costs and benefits will require analysts to draw broadly on the best evidence and methodologies available to produce a transparent, defensible valuation.</p> <p>Sector-specific CBA frameworks and valuation databases can be an important source of ‘standardised’ valuation parameters.</p> <p>Further detail on treatment of carbon emissions is provided in Appendix 3.</p>
Quantity cannot be precisely estimated <b>and</b>	<ul style="list-style-type: none"> <li>• Aesthetic effects of</li> </ul>	Minor costs or benefits can be described qualitatively.



Type of valuation	Examples	Treatment
hard to value in monetary terms	beautification programs. <ul style="list-style-type: none"> <li>• Community pride.</li> <li>• Increased research and development.</li> </ul>	Significant costs and benefits may warrant primary research (e.g., conducting surveys) or development of methods to quantify and value. Sensitivity analysis on these estimates and valuations will be critical.  Note: costs that cannot be valued are just as important as benefits that cannot be valued and should be accorded equal treatment.

## Escalation

CBA uses real values for cost and benefit streams, that is, inflation is excluded. The real prices of specific items might, however, be expected to change over the analysis period of a CBA. That is, some prices may be projected to increase significantly faster or slower than general inflation, for example land or housing. In such cases, the expected real price changes should be reflected in the cost and benefit streams and the CBA should document the assumptions used.

Generally, the default assumption will be no real escalation in the central estimate, but this can be challenged if there is supporting evidence from market indicators, market sounding, literature or empirical studies to expect real changes in prices over the long-term.

## Costings

**This Guide recommends that, where possible, costings based on expected value (i.e., average value) are used to determine costs in CBA for the central estimate.**

Costings used in CBA should become more accurate as it gets closer to the investment decision (e.g., detailed business cases should have more rigorous costings than strategic business cases). For early-stage investigations, the amount spent on developing cost estimates should be enough to support an informed choice, rather than being definitive.

Infrastructure NSW's *Cost Control Framework for the Infrastructure Program* provides a consistent approach to developing cost estimates for infrastructure initiatives.

Some initiatives produce cost estimates at the median level (also called 'P50'). Analysts should be wary of uneven, 'fat-tailed' or skewed cost distributions that can result in median cost varying significantly from the expected value (i.e., average cost).

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## 2.6 Assess net benefit (NPV and BCR) with sensitivity analysis

### Present values

CBA compares the **present values** of cost and benefit streams to allow for costs and benefits occurring at different times. This is calculated by discounting values in future years back to the present year using a central real social discount rate of 5 per cent. Appendix 6 provides further information on social discount rates.

Discounting reflects the view that a dollar received now can be invested to generate further returns, and so is worth more than a dollar received in the future. Using present values in CBA allows decisions to be made in the present about initiatives that have costs and benefits in the future.



## CBA results

The aim of CBA is to summarise the full impacts of an initiative. To achieve this, costs and benefits for all entities (households, firms, governments and non-government organisations, including environmental impacts) within the NSW community are aggregated into an overall measure of net social benefit.

In the CBA report, the following measures are **required** to be calculated for each option relative to the base case:

- **Benefit-cost Ratio (BCR)** – The ratio of the present value of net benefits to the present value of resource costs.
- **Net Present Value (NPV)** – The difference between the present value of benefits and the present value of costs.

The NPV and BCR both show, for a given discount rate, whether the quantified benefits are expected to exceed the quantified costs of an option. An option is expected to deliver a net increase in social welfare if the NPV is positive and the BCR is greater than 1.

Appendix 7 provides further detail about the NPV and BCR, including how to use the results to rank different initiatives.

## The central estimate

The central estimate of BCR and NPV is defined as the estimate produced using:

- the central real social discount rate set in this Guide (5 per cent)
- NSW referent group
- the agency's central estimates of costs and benefits. This should generally be the expected (average) values, but in some cases may be the most likely outcome, a conservative estimate, the median value or a midpoint or average of several estimates,
- quantified costs or benefits that are particularly difficult to estimate or attribute with confidence may be left out of the central estimate and instead included as 'upside' or 'downside' sensitivities.

## Sensitivity Analysis

CBAs are required to include sensitivity analysis that shows the impact on the BCR and NPV of each option when assumptions or parameters are adjusted, to plausible alternative values, to reflect key risks and uncertainties. Examples of sensitivity analyses include:

- Risks: low and high estimates of population growth or infrastructure usage.
- Assumptions: slow and fast uptake of a new service.
- Parameters: low and high estimates from the willingness-to-pay survey informing a benefit valuation.
- Discount rate: sensitivity test at 3 and 7 per cent (required).
- Climate change: low, medium and high warming scenarios.

The purpose of sensitivity analysis is to assess the robustness of the initiative to plausible variations from the central estimate. For example, one option might produce the highest NPV and BCR under the central set of assumptions but poor results under other plausible assumptions, while another option produces satisfactory results under all sets of assumptions.

Where there is a trade-off between possible higher net benefits and higher risk or uncertainty, sensitivity analysis allows for informed decision-making on how much risk to accept.

**Sensitivity analysis should be informed by key risks identified and how these affect the key outcomes of the proposal.** This should include identifying key dependencies between different elements of an initiative to help construct realistic upside and downside scenarios.

Where key variables may be correlated, sensitivity analysis can be run on **multiple variables moving at the same time**, e.g., a worst- or best-case scenario.

Sensitivity analysis should also consider which assumptions and parameters are subject to the greatest degree of uncertainty. The greater the uncertainty, the wider the range of outcomes that should be tested in a sensitivity analysis.

Finally, **probabilistic modelling analysis**, using techniques such as Monte Carlo analysis, can provide strong insight into complex or interrelated risks. Where data on the possible distribution of a variable exists or can be inferred, Monte Carlo analysis, for example, can be an accessible and useful tool.

Appendix 4.2 provides further practical guidance on conducting sensitivity analysis.

## Risk identification

Risks should be identified, planned for, and managed, with the goal of reducing or mitigating risks where possible. CBA should consider the impact and likelihood of residual risk – that is, the risks that remain after management and mitigation measures.

The degree of detail in identifying and assessing risks will depend on the nature of the initiative, including the variety of stakeholders involved. For example, smaller-scale initiatives may require testing against a sufficient contingency allowance, based on costs incurred in previous similar initiatives. At the other extreme, large complex projects may require significant investment in legal, commercial or technical engineering work to identify and value risks and provide adequate risk mitigation strategies.

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## 2.7 Assess distributional and equity impacts

The distribution of gains and losses can be an important aspect of a new initiative, particularly in a reform context. The success of an initiative may hinge on a robust understanding of the distributional impacts, as well as appropriate strategies to manage the distribution of gains and losses.

**This Guide requires that distributional analysis is included as supplementary information in a CBA.** Distributional analysis may be qualitative or ideally supported by quantitative findings where data allows.

Box 2.4 provides an example of how distributional analysis can help to promote equity by highlighting gains and losses. Appendix 5 provides further information, including templates.

### Box 2.4: Distributional impacts

An initiative to introduce a road-pricing regime could reduce congestion on the roads network. Given the varying travel requirements of different groups of households and businesses, the benefits and costs of a road pricing regime may not, however, be evenly distributed.

Although most road users would benefit from faster travel times, households with less flexible travel requirements might incur greater costs. These distributional impacts, even though they are transfers from one NSW party to another, can be usefully highlighted in CBA. Even if the project has a net social benefit, the costs imposed on low-income groups may highlight the need for mechanisms that manage the distribution of gains and losses more equitably (such as concessions).

Analysis of impacts by stakeholder groups (e.g., income bands) can help with assessment of distributional impacts. Any data limitations should be outlined.

Note that transfers between groups, which are highlighted in distributional analysis, need to be accounted for (i.e., netted off or excluded if both groups are NSW residents, see Appendix 3.6) in calculating the overall NPV and BCR to avoid double-counting.

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## 2.8 Report results and key findings in executive summary format

A CBA report should include an executive summary with the following key information:

- Central estimate of Net Present Value (NPV) and Benefit Cost Ratio (BCR) for each option relative to the base case, at the central real social discount rate (5 per cent).
- NPV and BCR results for each option in key sensitivity analysis, including the 'high' and 'low' discount rate sensitivities set in the Guide (7 and 3 per cent, respectively).
- A clear and concise summary of the:
  - **objectives of the initiative**
  - **base case**, and
  - **options assessed** (focusing on major differences between the options).
- A summary table showing **key categories of benefits and costs** and the dollar values and percentage contribution of each to total benefits or costs in each option, relative to the base case.
- Significant costs and benefits that could not be quantified and their expected impact
- All **critical assumptions**, supported by evidence. This includes key drivers, inputs, risks and assumptions used in constructing the base case and options.
- Examples of key assumptions include demand growth and its components (e.g., population growth or changes in usage of the service),
- Report which option performs the strongest in CBA. That is, the option with the highest central NPV and BCR (Appendix 7 provides guidance on situations where the highest NPV and BCR do

not align).<sup>9</sup> Agencies may view an alternative option as the strongest performer in the CBA if there are compelling indications that:

- critical costs or benefits that would influence the ranking of options could not be quantified, or
  - an option with a lower central NPV and BCR is more robust to key risks and uncertainties, as shown by stronger results in sensitivity analyses.
- If required, a separate presentation of NPV and BCR for each option with an alternate referent group. That is, a local referent group or a whole-of-Australia referent group.

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## 2.9 Establish evaluation and monitoring plan

The TPG22-22 Policy and Guidelines: Evaluation establishes that **initiatives resourced by the NSW Government must be regularly examined** to ensure they are achieving their intended outcomes and providing a net social benefit to the people of New South Wales.

CBA is the preferred approach for *ex post* economic evaluation. When effectively designed and implemented, *ex post* CBA can provide more accurate estimates than *ex ante* CBA. *Ex post* CBA results and insights can then build the evidence base for future *ex ante* CBA.

### Planning for monitoring and evaluation

It is critical for effective evaluation that agencies develop monitoring and evaluation plans early in the initiative design (well before implementation), including allocating funding to monitoring and evaluation.

Monitoring can be designed to track and report on initiative performance and inform ongoing improvement, and to collect information that will support evaluation. Evaluation should be scheduled as relevant to the key stages of initiative implementation and outcomes and benefits realisation, and the evidence required to inform decision-making.

The NSW Benefits Realisation Management Framework provides best practice principles for agencies in identifying, planning, managing, reporting and evaluating benefits. It also ensures that business areas are committed to realising benefits.

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## 2.10 Further assistance

Agencies are encouraged to contact their Treasury analysts early to work through any issues or queries. CBA related queries can also be sent to [cee@treasury.nsw.gov.au](mailto:cee@treasury.nsw.gov.au).

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<sup>9</sup> If all options have a negative NPV and BCR below one, then the base case is the strongest performer.

# Appendix 1: Forecasting

This appendix discusses practical forecasting issues and common methods, including:

- Overview of forecasting
- Best attempt forecasting
- Evidence and forecasting

## A1.1 Overview of forecasting

Forecasting outcomes is a key component of all CBAs and helps inform cost and benefit estimates. The aim of forecasting is to predict the **quantity or volume** of outcomes over the life of the initiative. This includes predicting the quantity or volume in the base case and the quantity or volume for each of the options evaluated. Together, this gives the change in outcome due to the initiative, e.g., change in passenger trips (outcome) from a public transport investment (initiative) that will benefit users or impose costs (impact).

Forecasting can be a challenging process as predicting future outcomes is inherently uncertain. In the face of such uncertainty, forecasts may rely on reasonable assumptions. Where forecasts depend on assumptions, the assumptions should be made explicit, and the sensitivity of outcomes should be tested and reported. **Assumptions should be guided by research and evidence.**

Analysts are encouraged to engage with Treasury as early as possible on forecasting challenges for complex initiatives, particularly if there are issues with quantifying outcomes or the cost of forecasting is considered excessive relative to the size of the project.

Some known forecasting challenges are listed in Box A1.1. Potential methods to counter these challenges include statistical or econometric analysis, relevant expert advice, and probabilistic assessment. In the end, **forecasts are the best unbiased estimates based on the methods and information available to analysts.**

### Box A1.1: Practical challenges to consider when forecasting

- Technological development, for example in communications technology or renewable energy.
- Attributing probability to events, in particular very low occurrence events (e.g., 1 in 1,000-year events) such as floods, that may be less predictable.
- Attribution concerns: accounting for other possible causes of outcomes (omitted variables).
- Changes in behaviour due to the initiative and its effects over time.
- Past events and behaviours may have limited applicability to new policies aiming to change current patterns of behaviour and social values.
- Complex and nonlinear systems, such as traffic modelling across a large transport network.
- Historical growth rates of key variables based on limited observations or an inappropriate reference group.
- Non-market outcomes that are not easily observable. Using proxies or functions to forecast values can introduce estimation errors.

### Box A1.1 continued: Practical challenges to consider when forecasting

- Complex interactions between ecological systems, for example, quality of groundwater and production functions for crop yields.
- Unexpected changes in taste and preferences, e.g., shifts towards working from home.

## A1.2 Best attempt forecasting

Estimating costs and benefits depends on assumptions made about quantity (or volume) on the one hand and unit costs or unit prices on the other. When a demand curve is available or can be estimated, then forecasting and valuation can be done together. Frequently this is not the case and forecasting and valuation (discussed in Appendix 2) are separate exercises.

Forecasting is challenging and more distant forecasts will be increasingly uncertain. A CBA should be undertaken on best attempt forecasting by using the best available data and methods to forecast how the proposed initiative affects outcomes that benefit the NSW community.

Best attempt forecasting should be supported by evidence and clearly catalogued in the CBA analysis to ensure the data used and assumptions made in this process can be reviewed.

### Breaking forecasts into logical parts

Forecasting attempts to obtain a plausible set of outcomes for identified benefits and costs over time. These outcomes are intended to show the ‘cause and effect’ or ‘attribution’ from an initiative. Forecasts can be undertaken for each option, the base case or to show the incremental change in outcome, such as forecasting that the base case occurs implicitly.

A useful way to approach forecasting is to break down the task into separate, manageable components. A simple list is discussed below in relation to demand:

1. **Identify the scope of the outcomes to be predicted:** Identify the ‘cause and effect’ in the primary market or activity following the introduction of the initiative and the extent to which the initiative will change behaviour. This should also be undertaken for third-party outcomes.
2. **Study area:** Identify the location that accounts for demand for the good or service by those within the referent group. The study area should be sufficient to account for all main direct users and any significant indirectly affected parties.
3. **Who will use the goods or service provided:** There may be various groups of users that may use the good or service provided by the initiative. Identifying the user group can help analysts to understand the potential number of individuals or businesses the initiative affects. Combined with the level of use, total demand can be estimated.
4. **Level of use by identified users:** Level of use relates to the *volume* of the good or service demanded by each user following the initiative. While a good or a service may be available, this does not mean the identified users will access it to the same level.
5. **Additional factors to consider:**
  - a. **Growth rates:** How will the number of users and level of usage change over the life of the initiative, e.g., is the number for each constant increasing or decreasing, will there be a ramp-up period before stabilising? Is it reasonable to assume that use will grow with the general



population, or should it be linked to a specific cohort (e.g., school aged children). Are growth rates borne out in *ex-post* evaluations?

- b. Clarify the timing and longevity of outcomes: Responses to some changes, such as price increases or take-up of a new service, tend to grow over time as firms and households adjust their behaviour. In contrast, responses to other changes, such as advertising campaigns, may decline over time.
  - c. Distinguish between stocks and flows: Is the good or service demanded for a single point in time (stock) or is it continuously available for users (flow)? Forecasting will differ for stocks and flows and analysts should ensure they are applying the correct inputs.
6. **Scoping the initiative to inform demand:** A key process for forecasting is to ensure the initiative's outputs are well scoped out to inform design and delivery, which ultimately affects use and costs. If the initiative's outputs are unclear, then this flows through to forecasts of demand. Professional advice may be needed to design the initiative, but to ensure this advice delivers on intended objectives it requires clarity when scoping potential solutions.
7. **Capacity:** When forecasting the outcomes of the initiative, consideration should be given to the capacity of the overall market, and the extent to which the market can absorb additional supply from the initiative, which may vary depending on the option being considered. That is, for some options there may not be sufficient demand to absorb the change in capacity or supply created (e.g., providing to a domestic market), others may have significant capacity (e.g., providing into an international market).

**These steps can also be applied to forecast the base case** without the initiative to ensure only incremental changes are counted. Forecasting the base case first identifies the scale of the problem or opportunity. This would start with identifying the situation today and then projecting this into the future. That is, current travel times, procedure waiting lists, intersection performance or flood damages. Then identify the drivers of this situation and how these drivers will change to forecast the base case outcomes.

## Sources of evidence for forecasting

There are many ways to forecast an outcome. Each type of forecast will require different types of data, knowledge, and expertise. They can also be undertaken using statistical or econometric methods, e.g., time series or cross-sectional analysis or other modelling approaches. Forecasts can be informed by qualitative methods such as expert opinion and some types of survey responses. Some of the sources of data are discussed below.

**Meta-analysis** draws on a pool of published studies to obtain estimates on mean impacts and variations. For those conducting a meta-analysis, it first requires a methodical, documented search for studies (taking care to avoid confirmation bias in searches), careful filtering to find comparable studies, and a standardised measure of effect so that the findings can be compared.

Simple meta-analyses find an average effect size and variance. More detailed studies use multivariate regression analysis to estimate an average effect size and variance controlling for quality of study, variations in the study populations, and other details in study implementation.<sup>10</sup>

Meta-analysis reduces the bias that can result from reliance on a single study (if there are robust criteria for inclusion of studies). However, when applying meta-analysis results to an initiative, it is still important to consider differences between socio-economic conditions in the research studies and the initiative's target cohort. In some cases, it may be appropriate to adjust results to account

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<sup>10</sup> For example, see Washington State Institute for Public Policy <https://www.wsipp.wa.gov/Publications>

for these differences, but these adjustments are complex, and likely require independent peer review.

**Simulation models** provide projections based on evidence collected and analysed over many years. Examples include computable general equilibrium (CGE) models, transport models,<sup>11</sup> climate change modelling, energy (electricity) demand and hydrological (water supply, or flood) modelling. Only CGE modelling is described in detail in the CBA Guide given its relationship to partial equilibrium which underpins CBA. CGE models show how an economy may respond to changes in policy, technology, or other exogenous factors, e.g., to forecast the impacts of tax policy, trade policy, climate change and changes in international prices on an economy (see Appendix 8).

**Market research** in the form of focus groups or other surveys are widely used to forecast consumer demand in the private sector. It can also be used to forecast how people will respond to changes in public programs or policies. For example, before requiring packaging of tobacco products to depict various forms of serious diseases in 2005, the Commonwealth Government commissioned extensive focus group research to determine whether tobacco smokers would change their smoking behaviour because of such pictures.

**Choice modelling** is a form of marketing research that has become more widely used in CBA to obtain estimates of consumer choices and surplus. It attempts to model the decision process of an individual via stated preference methods made in a particular context. For example, when constructing a cultural venue, choice modelling can be used to measure public reaction to choices of location, opening hours, contents, and other factors. Choice modelling provides a method for understanding and forecasting the trade-off decisions individuals are likely to make.

The choice of forecasting technique may depend on the available evidence or data. In other cases, it may be possible to use multiple sources of data or methods of forecasting to provide a well-rounded forecast to use in the CBA, known as 'triangulation'.<sup>12</sup>

## Reference Class Forecasting

Analysts should consider ways to minimise the potential for optimism bias in projects. An established method to address optimism bias entering in forecasts is reference class forecasting (RCF).<sup>13</sup>

RCF uses actual data on outcomes from a group of past, similar initiatives (the reference class) to inform forecasting of the current initiative's outcomes.<sup>14</sup> For example, if we are producing a CBA for a new bridge, our forecasts could be informed by data on actual outcomes versus forecast outcomes for cost, schedule, and usage of the last five similar bridges built in Australia.

RCF takes an outside perspective to forecasting by basing estimates on the actual past performance of other initiatives relative to forecasts. This contrasts with an inside view, where a project team bases forecasts on their own views about the specific features of their initiative.

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11 See Transport for NSW – Cost-Benefit Analysis Guide, Section 4.1.6 for more information.

12 Triangulation takes multiple studies or data sources investigating the same (or similar) subject and assists to improve the credibility of findings or explain unexpected findings. It is good practice to triangulate transferred estimates across different studies, where possible. When multiple sources of reasonable quality exist, triangulation can offset limitations and biases that can arise from using a single source. Triangulation can be applied to data sources, theory, investigator and methods as identified in Denzin NK (1978) 'Triangulation: a case for methodological evaluation and combination', *Sociological Methods*, 339-357.

13 Studies can account for optimism bias by adjusting based on prior over or underestimations, see Salling KB and Leleur S (2017) 'Transport project evaluation: feasibility risk assessment and scenario forecasting', *Transport*, 32(2):180-191.

14 Flyvbjerg and Bent, (2008) 'Curbing optimism bias and strategic misrepresentation in planning: reference class forecasting in practice' *European Planning Studies*, 16(1): 3-21.



The reference class used should be similar to the proposed initiative. Note, RCF provides a best estimate based on the average of the reference class. The initiative may perform better or worse than the reference class and RCF does not account for unknown, material differences between the initiative and the reference class.

RCF is carried out in three steps:

1. Identify the reference class, that is a plausible and comparable set of previous projects that is broad enough (to be statistically significant) but still relevant to the initiative.
2. Establish a probability distribution for the reference class, which will depend on quality data across a reasonable number of projects. For example, the probability distribution of cost overruns relative to business case estimates.
3. Compare the proposed initiative with the reference class to establish its outcome within the distribution.

RCF is also useful in dealing with quantifiable risks by placing the forecast within a reference class of previous similar projects that may have faced similar risks (with similar probabilities of occurring).

## A1.3 Evidence and forecasting

Evidence used to inform forecasting can come in multiple forms from multiple sources. The assessment of evidence should be informed by two governing aspects:

- **Relevance:** how closely connected or related the evidence is to the policy initiative.
- **Validity:** relates to causality, i.e., the appropriateness of the method used to assess the attribution of the initiative, i.e., the measured difference to the base case.

Evidence hierarchies may be considered by analysts as useful in assessing how evidence compares against other sources. Hierarchies can convey the sense that there is a consistent set order of evidence which is preferred for CBAs. However, this is not always the case and hence evidence selection should rely on relevance and validity.

Treasury remains agnostic as to the source of evidence used to forecast. All else being equal, studies may be preferred if they are published in high-quality journals, if they use Australian data, if they are published more recently, and if they are more similar to the initiative under consideration.

### Evidence used to support forecasting

There are three main types of evidence to support forecasting:

- experimental studies
- quasi-experimental studies
- non-experimental studies.

*Ex post* evaluation of the same initiative in New South Wales provides the most relevant source of evidence for *ex ante* CBA of the same or similar initiatives, see the [NSW Government Guide to Evaluation \(TPG22-22\)](#). They can provide both the relevance and validity required for future investment decisions on the same or closely related initiative. Therefore, emphasis should be given both to undertaking and sourcing data from *ex-post* evaluations.

### Experimental studies

Experimental studies randomly assign participants into a treatment group that receives the intervention being studied and a control group that does not receive the intervention. With an

appropriate sample size, randomisation means that any differences in outcomes between the treatment group and control group are likely to have been caused by the intervention.

### Quasi-experimental studies

Quasi-experimental studies, also known as non-randomised experimental studies, lack random assignment of participants to a treatment or control group.<sup>15</sup> Instead, the subjects of the study are assigned to the treatment through some non-random criteria, like geography or eligibility cut-offs.

### Non-experimental studies

Empirical work in the social sciences is often based on natural data. That is, data on things occurring in the world (without the intervention of a researcher, as distinct from experimental data). Natural data may consist of time series, cross-sectional data, or a combination of each and may be obtained via regular or one-off surveys. This data also includes official projections of important drivers such as, but not limited to, population, labour force and demography.

Economists often draw on **natural (experiments) data** for forecasting when experimental studies are impractical or unethical.<sup>16</sup> For example, unplanned differences or changes in situations are used to estimate behavioural responses, such as the impact of a change in income or price on demand, i.e., estimated income and price elasticities (see Box A1.2). Elasticities are obtained from studies that consider the impact of changes in demand and supply on prices or income.

#### Box A1.2: Use of elasticities to forecast changes in outcomes

**Generic income or price elasticities** derived from multiple studies are a related form of meta-analysis. There are many published price elasticities of demand for goods, examples include water, electricity, public transport and petrol.

Take care transferring generic or average elasticities to a new context. Demand and supply elasticities can change in response to demographic factors, income levels and availability of substitute goods, and importantly relate to a timeframe. For most goods or services, it is important to clarify between short-run and long-run elasticities that may change over time in unpredictable ways.

Establishing causal relationships between initiatives and outcomes using natural data is challenging due to a **lack of random assignment**. This places a large weight on econometric methods to determine cause and effect.

**Time series data** typically draws on aggregate or average data over time for a single variable. The use of averages may limit the ability to infer outcomes about individual behaviour. **Cross-sectional data** includes data on individuals across many variables at a point in time, however it is important to understand how characteristics of individuals may affect outcomes.

**Panel data** combines time series and cross-sectional data by following a set of people over time and may draw on aggregate comparisons between countries, between states within a country, or on longitudinal data on individuals. In cross-country or cross-state studies, the analyst explores the effects of national or state differences on the outcomes of comparable initiatives. Differences in

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<sup>15</sup> See Galama TJ, Lleras-Mulney A and Kippersluis HV (2018 January) 'The effect of education on health and mortality: a review of experimental and quasi-experimental evidence' (Working Paper No. 24225), <http://www.nber.org/papers/w24225>, for a review on quasi experimental evidence regarding the effect of education on health and mortality.

<sup>16</sup> Also known as observation data in statistical or econometrics textbooks.

other economic or social factors, however, may also influence behaviour and be difficult to model precisely. Panel data can suffer from the same econometric problems experienced with time series and cross-sectional data.<sup>17</sup>

Some studies use **longitudinal panel data** to infer how long-term changes in individual circumstances influence individual outcomes. The Melbourne University HILDA survey is well established as a high-quality Australian longitudinal survey. As with other approaches, care is needed to model all the critical factors and their interrelationships.

Non-experimental designs can also use **descriptive or observational data**. The former includes simple point-in-time statistics that describe the existence of an occurrence and may sometimes be useful to forecast the base case. The latter can examine changes for participants before and after an initiative’s implementation (i.e., pre-post studies) or provide context for changes caused by the initiative and identify external factors influencing change.

Non-experimental designs alone provide weaker evidence that the initiative **caused** the observed outcomes. Non-experimental designs are useful for providing context and narrative to the CBA.<sup>18</sup>

Finally, where relevant data is not available, as a fallback, CBA may draw on independent **expert advice**. Where the opinions of experts are the best form of evidence available, it is good practice to instead seek out the views of multiple experts to triangulate findings. Table A1.1 provides some useful references to non-experimental data sources.

Table A1.1: Common sources of forecasting evidence

Data Source	Description
<b>NSW Common Planning Assumptions</b>	NSW Common Planning Assumptions are the agreed information assets (data sets, parameters and assumptions, models, and analytical tools) used by NSW Government and external stakeholders to prepare proposals, that rely on projections. They provide a consistent evidence base to use in planning for key services and infrastructure in the state, from schools and hospitals to roads and transport.
<b>Australian Bureau of Statistics Key Economic Indicators</b>	The ABS is a useful place to start searching for general economic indicators. It provides an overview of key economic statistics used in forecasts containing information on national accounts, consumption and investment, production, prices, labour force and demography, incomes, and leading indicators.
<b>Commercial data, market research providers</b>	Commercial providers exist that provide industry research on thousands of industries worldwide. These data providers may provide parameters that can assist to estimate economic surplus or provide a reasonable proxy.
<b>Household, Income and Labour Dynamics</b>	The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a household-based panel study that collects valuable information about economic and personal wellbeing, labour market dynamics and family life. It aims to tell the stories of the same group of Australians over the course of

<sup>17</sup> Panel data is a form of longitudinal data for which observations of the same cross-sectional subjects are made over time for a sample group.

<sup>18</sup> See Achelrod D, Blankart CR, Linder R, Von Kodolitsch Y and Stargardt T (2014) ‘The economic impact of Marfan syndrome: a non-experimental, retrospective, population-based matched cohort study’, *Orphanet Journal of Rare Diseases* 9, 90. <https://doi.org/10.1186/1750-1172-9-90>, for an example of non-experimental study design.

Data Source	Description
in Australia (HILDA) Survey	their lives. Other integrated datasets are available from the ABS such as Multi-Agency Data Integration Project (MADIP) etc. <sup>19</sup>
Business Longitudinal Analysis Data Environment (BLADE)	The Business Longitudinal Analysis Data Environment (BLADE) is an economic data tool combining tax, trade, and intellectual property data with information from ABS surveys to provide a better understanding of the Australian economy and business performance over time. Authorised researchers use BLADE to understand how businesses fare over time and the factors that drive performance, innovation, job creation, competitiveness, and productivity. It can provide new insights into the development and evaluation of government policies, programs, and services.

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<sup>19</sup> MADIP is a secure data asset combining information on health, education, government payments, income and taxation, employment, and population demographics (including the Census) over time. It provides whole-of-life insights about various population groups in Australia, such as the interactions between their characteristics, use of services like healthcare and education, and outcomes like improved health and employment.

# Appendix 2: Valuation

This appendix contains the following sections:

- Valuation principles: opportunity cost and willingness to pay (or accept)
  - Valuation methods: market and non-market (including benefits transfer) prices
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## A2.1 Valuation principles

Where valuation of goods and services is possible, two key concepts are relevant: the **opportunity cost** principle and the **willingness-to-pay** (or willingness-to-accept) principle.

### Opportunity cost

Committing resources to an initiative precludes their use elsewhere. **The value of these resources in their most attractive alternative use is their opportunity cost.** Market prices usually reflect the opportunity cost of resources.

Resources used in an initiative should generally be valued in CBA at their opportunity cost, even if the agency can access them at less than market price.

For example, if an initiative proposes to use land that the agency already owns, then the land might appear to be costless. However, in the base case (where the initiative does not proceed), the land could be used for an alternative purpose. Therefore, the cost of the land in the CBA should reflect that alternative use foregone, represented by its market value.

Similarly, the opportunity cost of labour used in an initiative is equal to the value of the worker's output in their next best employment. In a competitive market, this is equal to the worker's highest alternative wage. However, where workers have occupational preferences, the real cost of employing someone is their reservation wage – the minimum amount that will attract the worker into a specific job.

Based on the opportunity cost principle, benefits of an initiative could be estimated based on the avoided cost of delivering public services no longer required. For example, the benefits of an early intervention policy could be valued at the avoided cost of delivering policing, courts, or incarceration services. Similarly, the benefits of a preventative health measure could be valued at the avoided costs of the acute medical services no longer required.

### Willingness to pay

Willingness to pay (WTP) is **the maximum amount an individual or a firm is willing to pay for a good or service.** In CBA, goods and services are generally valued at the highest amount of money that individuals or firms are willing to pay for them.

Willingness to accept (WTA), a related concept, is the amount that individuals or firms are willing to accept in compensation for the loss of a good or service (e.g., loss of an environmental good like clean air).

The difference between WTP and WTA is based on the analyst's assumption on whether the individual or firm had a right to the good or service in question in the base case. In the former, no good or service is provided without action, in the latter, the good or service is available (or potentially available) to the individual or firm and the action denies its use.

Prices in competitive markets reflect the value of the good or service to the marginal consumer (this is assumed to remain the case if an initiative causes small or marginal changes in output or price

levels). Consumer surplus is equal to the difference between a consumer's maximum willingness to pay for a good or service and the price actually paid.

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## A2.2 Valuation methods

### Market-based valuation methods (prices)

**Benefits and costs in CBA should be valued at market prices whenever prices or reasonable proxies are available.** As discussed, prices in competitive markets reflect the principles of opportunity cost and willingness-to-pay.

Market-based valuation relies on analysis of market information on consumer behaviour and prices in similar, complementary, or related markets.

Market-based prices are relatively straightforward for estimating costs, such as materials and labour. The cost of acquiring an asset can be valued based on:

- replacement cost at current market prices (as opposed to book value), or
- damage (mitigation) cost, the cost of works to prevent damage to an asset.

Market data can also be used to value benefits. For example, wage premiums for students at different levels of achievement can be used to value the productivity benefits of education.

Market prices in substitute or complementary markets can also be used to value some benefits. For example, the value of treating water to improve safety and quality could be inferred from the market price of bottled water.

**When markets are competitive, market data can directly provide information required for CBA.** When markets are not competitive, however, prices may need to be adjusted to reflect real economic values.

### Adjustments to prices to reflect true cost (shadow prices)

A shadow price is an estimate of a price when:

- a market price is not available, e.g., use of national parks (that can be measured using revealed or stated preference) discussed in the following section, or
- the market price is known to be distorted. In this instance a subsidy (tax) on production will lead to a lower (higher) price than the true economic cost.

The use of shadow prices (i.e., adjustments to observed market prices to reflect the real cost of a good or service) could be considered where:

- Taxes and subsidies drive a substantial wedge between the real costs of production and prices. If an initiative results in a domestically produced good's output increasing, then the price less any indirect taxes and subsidies is the true economic cost. If the good is in fixed supply, the full market price should be used (including any taxes and subsidies).
- The resource used (non-labour inputs, labour) would otherwise be unemployed or under-employed so that the opportunity costs of labour employed on an initiative are less than the wage costs and the initiative's costs could be adjusted accordingly.

Shadow price adjustments **for use of resources (labour, non-labour inputs to production, land) are not commonly used in Australia**, and this Guide cautions doing so due to the significant measurement complexities involved.



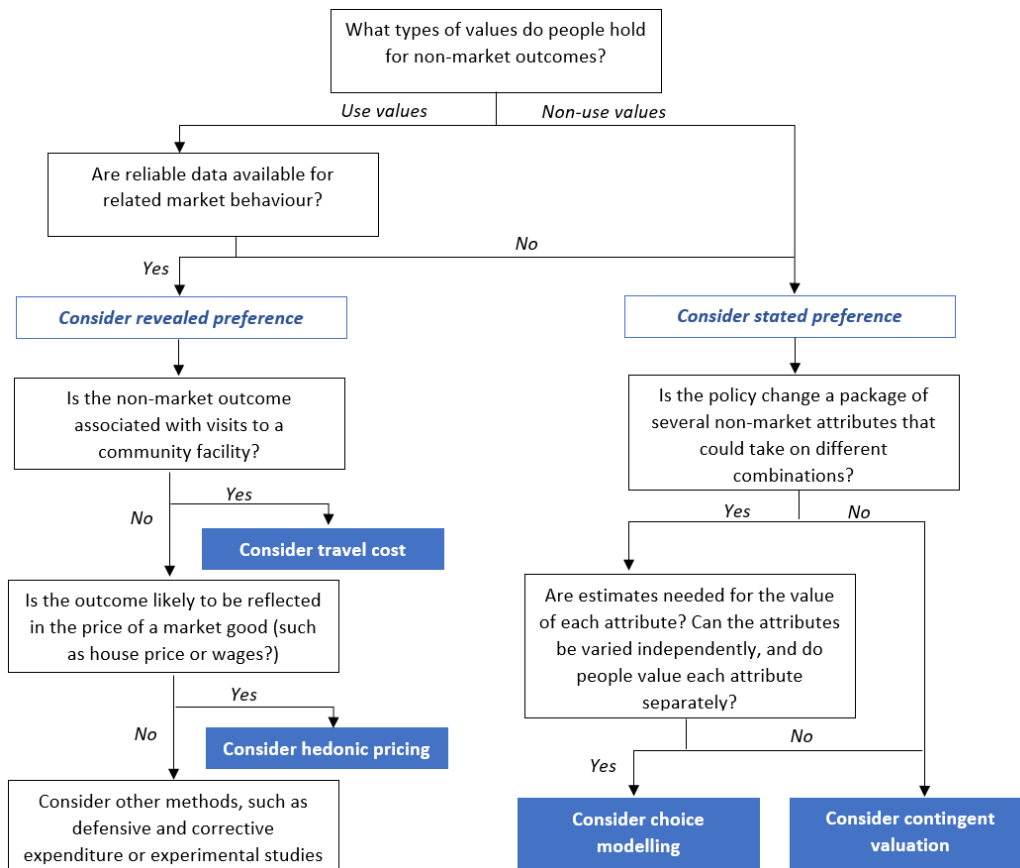
## Non-market valuation methods

Non-market valuation methods may be required when markets for a good or service are not available or are heavily distorted. Values generated from non-market valuations are typically called ‘shadow prices’. Some common non-market outcomes have pre-established methods of valuation and standard parameters available from the NSW Government, for example, non-traded outputs such as travel time savings for transport projects.

Selecting the appropriate non-market valuation approach is based upon several factors that include the type of values that individuals hold for the outcome (use, non-use, or both) and the quality and availability of data. The most important aspect is ensuring the valuation measures the specified outcome. Figure A2.1 provides a framework for selecting non-market valuation approaches to use.

**When non-market valuation methods are used, all else equal, revealed preference methods are likely to be more reliable than stated preference.**

Figure A2.1: Selecting a non-market valuation method – initial questions



Source: Treasury based on Baker and Ruting (2014) Environmental policy analysis: a guide to non-market valuation, productivity commission staff working paper, p. 51.

## Revealed preference methods

Revealed preference (RP) methods estimate consumers’ willingness to pay (WTP) by examining their actual behaviour. The four main revealed preference methods are hedonic analysis, travel costs analysis, defensive expenditure, and special experimental studies.

**Hedonic analysis** conceptualises goods as ‘bundles’ of attributes and assumes that the price of the good is the sum of the value of these attributes. Regression analysis can then be used to determine the values of the attributes (i.e., ‘correlation’ between the price of the good and a change in its attributes). Two major applications are hedonic analyses of house prices to elicit non-market environmental values and wages to elicit returns to education.

For example, a hedonic analysis could estimate worker earnings as a function of years of schooling, while controlling for relevant factors like work experience, industry and demographics, to estimate the price of schooling in the labour market.

### Box A2.1: Hedonic analysis

Criteria to help determine the quality of a Hedonic study:

- Data sources and any transformations of data are clearly specified.
- The market is characterised by many transactions, and any regulatory distortions to prices are considered in the analysis.
- Justifications are provided for the scope of the market used in the analysis (such as the geographic scope of a housing market), and alternative definitions are tested where appropriate.
- Where data on all relevant attributes are not available, the potential impact of any omitted variables is discussed.
- Variables used in the statistical model are carefully chosen to reduce multicollinearity or endogeneity.
- Implicit price estimates are only used to value small or marginal changes in attributes.

**Travel cost studies** are used to value community facilities, such as parks and recreational sites, that generally have no, or very small, entry fees. The travel cost method assumes that visitors to these sites still incur costs in the form of time, transport, and accommodation. Data collected on these costs is used to estimate the demand curve and consumer surplus — **travel costs themselves are not the actual shadow price of the non-market good or service**. A critical assumption of the travel cost method is that the trip has a single purpose. If a trip has several purposes the travel costs must be allocated between them.

### Box A2.2: Travel cost studies

Criteria to help determine the quality of a travel cost study:

- Data and assumptions relating to the costs people incur when travelling are clearly set out.
- Attempts are made to determine what proportion of these costs can be attributed to the site of interest, based on responses to the survey.
- Substitute sites are considered in the statistical model.
- The treatment of multiple-purpose and international visitors in the analysis is clearly specified.
- Justification is provided for the value placed on the time cost of travel.
- The information and questions in surveys are clear and unambiguous. Sampling techniques are explained and response rates identified.
- A copy of the survey instrument is attached to the study.

**Defensive and corrective expenditure** is expenditure that mitigates the negative impact of an event before it occurs or reduces damages after it occurs. The value of goods can be inferred from



defensive expenditure by assuming that a consumer will purchase goods and services up to the point where marginal benefits are equal to marginal costs.

This method, however, must be used with care as some expenditures are lumpy (e.g., household solar systems). Corrective expenditures that restore the individual or asset to their previous, undamaged state represents what parties are willing to pay for the good or service involved. A common example is health care expenses to treat illnesses arising from pollution (sometimes described as the cost of illness valuation method).

**Experimental studies**, including field and laboratory studies, can also provide valuation information. Some studies have shown that lab experiments on social dilemmas can be valid outside the lab environment. Caution, however, is required when extrapolating results, for example:

- Laury and Taylor (2008) found that the amount contributed in a public good lab experiment was positively correlated with the willingness to contribute money to a local tree-planting organisation<sup>20</sup>
- Ilona et al. (2019) found that lab based public good games were positively correlated to real world outcomes in the case of free riding in university assignments<sup>21</sup>
- Saldarriaga-Isaza et al. (2019) found that decisions made by university students in a public good lab experiment correlated to what artisanal gold miners decided in a lab-in-the-field experiment.<sup>22</sup>

Therefore, it would be prudent for this type of analysis to be reviewed by behavioural economists early in its development to ensure findings can be applied beyond the lab.<sup>23</sup>

## Stated preference methods

Stated preference (SP) methods ask individuals to self-report their preferences or valuations, the two main methods are:

- **Contingent valuation** – Surveys asking consumers how much they are willing to pay to retain (or avoid) something. This may be in the form of a binary (yes or no) answer in response to a given price or range of prices. This method has been widely used, mainly to value environmental programs.
- **Choice modelling techniques**<sup>24</sup> – Surveys typically asking respondents to select from a number of pre-defined options. Each option is described in terms of different levels of a common set of attributes. Analysis of the trade-offs between attributes and price provides monetary valuations of the attributes.

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20 Laury S and Taylor L (2008) 'Altruism spillovers: are behaviours in context-free experiments predictive of altruism toward a naturally occurring public good', *Journal of Economic Behaviour and Organisation*, 65(1):9-29.

21 Reindl, Ilona, Hoffmann, Roman, Kittel and Bernhard (2019) 'Let the others do the job: comparing public good contribution behavior in the lab and in the field', *Journal of Behavioral and Experimental Economics* (formerly The Journal of Socio-Economics), Elsevier, 81(C):73-83.

22 Saldarriaga-Isaza A, Villegas-Palacio C, and Arango S (2019) 'Chipping in for a cleaner technology: experimental evidence from a framed threshold public good game with students and artisanal miners'. *Journal of Behavioural and Experimental Economics*, 78, 10-16.

23 Further, experimental studies should be grounded in the methodological approach set out by Vernon Smith (1976, 1982) as discussed in Alm J and Jacobson S (2007) Using laboratory experiment in public economics. Article in *National Tax Journal* and mindful of the 12 actions that might help to alleviate the 'credibility crisis' discussed in Czibor E, Jiminez-Gomez D and List JA (2019 January) *The dozen things experimental economists should do (more of)* (Chicago Experiments Initiatives Working Paper No. 2019-01), <https://www.nber.org/papers/w25451>.

24 See for example Hensher D, Rose J and Greene W (2005) *Applied choice analysis: a primer*, Cambridge University Press.

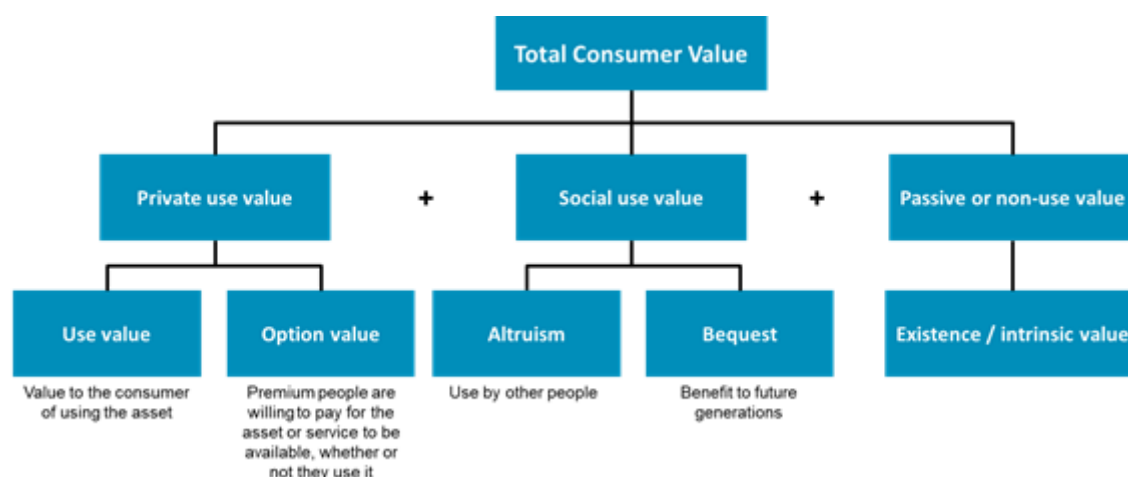
SP surveys can measure WTP on an individual or household basis and this unit of analysis should be made clear in CBA. **Household WTP is generally preferred over individual WTP** as previous studies<sup>25</sup> suggest that adding up WTP of individuals in a given household tends to result in overstating the WTP of the household as a whole.<sup>26</sup> The CBA should clearly specify whether the WTP estimate is measuring:

- Consumer benefit deriving from **use**, i.e., an individual’s or household’s willingness to pay for the consumption of a good or the service being provided by the proposed project or program, or
- Non-consumer benefit deriving from **non-use** – this could include any or a combination of altruism, existence value, or option value (see Figure A2.2).

In practice, the two measures are likely to differ in respect of how they are counted in the benefit streams of a CBA. Typically, consumer benefits deriving from use of a public good or service **should be estimated over the entire CBA analysis period and not as a one-off up-front benefit or payment**.

Where a **WTP for non-use** estimate is valid, it may be counted as a **one-off up-front benefit or payment** which can potentially offset the real resource cost of the program, consistent with the timing of the receipt of expected payment (e.g., at commencement of construction or operation, or staged over a multi-year construction period).

Figure A2.2: Theoretical components of consumer value<sup>27</sup>



SP techniques often rely on survey responses and econometric analysis of results and surveys are subject to several well-known challenges including hypotheticality, biases, and strategic responses.

If multiple SP surveys exist for a non-market good, then it is recommended to present the findings from each survey in the CBA, because:

25 See for example Quiggin J (1997) 'Individual and household willingness to pay for public goods', *American Journal of Agricultural Economics*; and Lindhjem H and Navrud S (2008) 'Asking for individual or household willingness to pay for environmental goods – implication for aggregate welfare measures'. MPRA Paper No.24070.

26 There are also different WTP concepts that may apply to these services. For example, WTP for the consumption of a good or service (a private use value) is different from WTP to enable the provision of the service (a non-use value to a donor). It is appropriate to treat the two concepts differently in a CBA.

27 The chart is adapted from previous work on applied environmental economics. See for example Figure 1.1 in Bateman I, Lovett A and Brainard J (2003) *Applied environmental economics*, Cambridge University Press and Figure 2.1 in Smith M, de Groot D and Bergkamp G (2006) *Pay-Establishing payments for watershed services*, International Union for Conservation of Nature, , Switzerland, 109.. This variation was developed by NSW Treasury’s First Nations Economic Wellbeing team.

- This can validate the estimated valuation by presenting multiple, similar results.
- Where results are varied between surveys, robust CBAs will provide insights as to why estimates are varied. This could include environmental considerations, population differences or other structural effects.
- Where estimated prices for the same good vary, the estimate based on quality evidence and characteristics that closely align to the good are preferred.

Commissioned SP studies can help build the evidence base for future CBAs. SP reports do this by including details that will make it easier for future CBAs to transfer the results into a similar context. Ideally, this will include estimating a benefit transfer equation.<sup>28,29</sup>

## Treatment of willingness to pay estimates in CBA

Where possible, WTP measures in a CBA should aim to distinguish between private use value and all other values **to avoid double-counting of benefits**. Where an aggregate WTP measure includes non-use values that cannot be separated from private use values or option value, the CBA should state this clearly and the assessment of validity should consider the plausibility of the aggregate WTP measure.

In practice there is likely to be significant overlap between various categories of consumer value, particularly non-use values such as in the following cases:

- With cultural, natural, or environmental assets, it can be difficult to distinguish between and separately estimate the various categories of non-use value and private option value.
- It may be possible for non-use value to account for the bulk of benefits from significant natural or environmental assets.
- Built assets with a primary value ultimately residing in their use would be expected to derive most (if not all) of their benefits from private use value – e.g., stadiums, cultural or recreational facilities. Where this is not the case, the CBA should rigorously document the validation procedures used.

Option value is excluded as it is often not possible to confidently sign or quantify it.<sup>30</sup>

**Where non-use values do not meet the required validity tests, these values should be included in sensitivity tests**, where the CBA presents supporting information, these benefits exist and are attributable to the initiative.

## Wellbeing Valuation

Wellbeing valuation starts with an analysis of people's overall life satisfaction and then applies econometric methods to estimate the life satisfaction provided by specific non-market goods. It then converts these into a monetary value using an estimate of the relationship between income levels and life satisfaction.<sup>31</sup> This approach is similar to 'Social Impact' or 'Social Value' assessment

28 HM Treasury, Supplementary Guidance: Economic Valuation with stated preference techniques, 72-73.

29 Baker R and Ruting B (2014) 'Environmental policy analysis: a guide to non-market valuation' Productivity Commission Staff Working Paper, Productivity Commission, Canberra, 44-48, provide further discussion on how to consider including SP results from a study in a CBA.

30 Boardman AE, Greenberg DH, Vinning A and Weimer DL, (2018) *Cost-benefit analysis – concepts and practice*. 5th ed. Cambridge University Press, sections 12.2-12.4. As discussed in Boardman et al (2018) option value is the difference between option price and expected surplus, the latter is what is usually measured.

31 UK Treasury (2011) Green Book: Appraisal and evaluation in central government 58. For an example applying this approach, see Trotter L, Vine J, Leach M and Fujiwara D (2014) *Measuring the social impact of community investment: a guide to using the wellbeing valuation approach, housing associations charitable trust*.

(<http://www.hact.org.uk/sites/default/files/uploads/Archives/2014/3/MeasuringSocialImpactHACT2014.pdf?sid=9120>).

or measurement, developed more recently.<sup>32</sup> Note, CBA is explicitly seeking to measure wellbeing using monetised units, wellbeing valuation is not a separate approach to CBA that includes additional information.

Data sources and methodology for deriving wellbeing value estimates in Australia **should be rigorously documented**, particularly if intended for use in future CBAs. Triangulation of estimates from multiple surveys is encouraged. Triangulation is the process of comparing findings with those found elsewhere, including other countries, regions, or times, alongside a logic check of why similarities or differences between values exist.

Subjective wellbeing estimates are not generally expected to coincide with conventional SP valuations. Triangulating results is not just to assess if valuations produce the same answer, but whether differences in results are plausible due to methodological differences.<sup>33</sup>

As wellbeing valuation is an emerging field, this Guide recommends that, all else equal, **core CBA results must be based on established non-market valuation approaches such as revealed preference or stated preference methods**. Results based on wellbeing valuation could, in future, be shown separately in sensitivity analysis, but Treasury should be consulted before this work is undertaken.

## Benefit transfer

Benefit transfer draws valuations from existing studies to use as proxy values for benefits or costs of the current initiative.

Benefit transfer is increasingly being used in Cost-Benefit Analysis due to its practicality. While there are known limitations due to differences in contexts between the original study site and proposed site, it is widely accepted as a reasonable method in many circumstances.

### Selecting studies for benefit transfer

Two key questions for transferring values from an existing study are:

- Is the original study of high quality and has it produced unbiased estimates?
- Is the value in the original study applicable to the context of the current initiative?

Benefit transfer is only as good as the underlying study from which it transfers. While lower quality values can still be transferred, the confidence around the estimate may diminish. It is recommended to document areas of uncertainty in the CBA.

Before selecting studies for transfer, analysts must clearly define the context of the current intervention (e.g., demographics and location).<sup>34</sup> It is essential that there is a high level of comparability between the study sites being considered, including a relevant operating environment, jurisdiction and context. In practice, this is not always possible, therefore transparency is important in the benefits transfer process. Table A2.1 provides a checklist to apply when considering using benefit transfer.

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<sup>32</sup> Note: this is not the same as 'social impact assessment' required by NSW environmental legislation.

<sup>33</sup> See, UK Wellbeing Guidance for Appraisal – Supplementary Guidance Annex 3 for further information.

<sup>34</sup> Rolfe J, Johnston RJ, Rosenberger RS and Brouwer R (2015) *Benefit transfer of environmental and resource values: a guide for researchers and practitioners*. Springer.

Table A2.1: Benefits transfer checklist<sup>35</sup>

Considerations	Description
Policy context	This helps selecting relevant primary studies to transfer. For example, if the project is about air quality, then studies on air quality are more relevant for transfer.
Definition of the entity	The quantity or quality of the good or service must be similar, but so must the impact of the scenario on the entity, and the intended use of the entity. For example, if a study provides a WTP estimate for protecting public open space for recreation benefits, these benefit values could not be applied to conserving biodiversity.
Quality of the study	The quality of data collection and estimation will affect the transferred values.
Socio-demographics of the population	The socio-demographics between the sites must be similar for values to be transferred. This includes age, gender, income levels, income distribution, and education.
International differences	If transferring from an international study, differences in culture, currency, and wealth should be considered.
Scale differences when aggregating	Are there differences between the benefits being valued in the original study and the new context, such as population sizes? Population differences may be solvable by aggregating on a per head basis.
Scope effect	A scope issue arises when a WTP estimate is applied to a change in the project case that exceeds that for which it was estimated. For example, the value that an individual places on living near a park depends on how many other available parks there are. The value of the resource change (i.e., number of parks) cannot be estimated by multiplying a value from the literature for a specific resource change by the ratio of the resources of the policy and study sites.

## Methods for transferring valuations

There are two common methods to conduct benefit transfer: **unit value transfer** and **benefit function transfer**.<sup>36</sup>

### Unit Value Transfer

Unit value transfers take an estimate or set of estimates directly from an existing study. Unit value transfers are either unadjusted or adjusted.

35 Iftekhhar MS, Gunawardena A, Fogarty F, Pannell D and Rogers A (2020) *INFFEWS value tool: guideline (Version 3): IRP2 comprehensive economic evaluation framework (2017 – 2019)*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

36 Boyle KJ, Kuminoff NV, Parmeter CF and Pope JC (2010) 'The benefit-transfer challenges', *Annual Review Resource Economics*, 2(1):161-182.

- Unadjusted unit value transfer assumes marginal values are the same between the existing study and the current initiative, i.e., a direct unit transfer of average WTP estimates.
- Adjusted unit value transfer adjusts the estimates taken from the original study to better reflect the context of the current initiative.

Adjustments to WTP estimates are only advised when the method of adjustment is well evidenced. Generally, more complex adjustments reduce confidence in the transferred estimate.

Some key points to consider when transferring unit values:

- When the quantity or quality of a good or service differs between the original study and the current initiative, there is a risk of values being over- or under-estimated.<sup>37</sup> For example, if an existing study on the value of green space near homes estimates WTP of \$100 per person to live near a one-hectare park, then a current initiative to provide a 100-hectare park cannot assume WTP of \$10,000. In the presence of declining marginal utility, this would be an over-estimate.
- Caution is also required if benefit transfer aims to apply valuations elicited from a particular socioeconomic group in the original study to a larger population in the current initiative.
- For values that are transferred, an upside and downside sensitivity test should be included (guided by the range of estimates, i.e., the standard deviation units).

### Benefit Function Transfer

A **benefit function** is an estimated relationship between the WTP estimate and a set of variables. The set of variables could include quantity and quality of the good or service being valued, characteristics of the site, and characteristics of the population.<sup>38</sup>

Benefit function transfers have two main requirements:

- A regression model, or some parameterised function, to calculate the WTP as a function of variables (e.g., green space, number of schools, house prices) reflecting conditions in the original study.
- Information on those variables for the current initiative, so the transferred function can be applied.

Two potential errors are likely to occur with benefit function transfers:

- **measurement errors** due to errors within the original study, like methodological errors or biased estimates
- **generalisation errors** arising during the transfer of values, like incorrect benefit scaling or low transferability.

Benefit functions are generally regarded as more accurate than direct unit value transfers due to the ability to adjust for differences between the original study and current initiative. However, these adjustments also increase the likelihood of generalisation errors, and the data and expertise required for benefit function transfer is a significant challenge.

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37 Rolfe J, Johnston RJ, Rosenberger RS and Brouwer R (2015) *Benefit transfer of environmental and resource values: a guide for researchers and practitioners*, Springer.

38 Iftekhhar MS, Gunawardena A, Fogarty F, Pannell D and Rogers A (2020) *INFEWS value tool: guideline (Version 3): IRP2 comprehensive economic evaluation framework (2017 – 2019)*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.



# Appendix 3: Common issues in CBA

This appendix provides guidance on a range of practical issues in CBA, including:

- Considerations associated with the analysis period
- Treatment of the factors of production
- Practical issues in CBA
- Carbon emissions
- Items that should be excluded from CBA
- Transfer payments (including discussion of grants and taxation)
- Additionality, displacement, and leakages

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## A3.1 Considerations associated with the analysis period

### When it differs between projects (project comparison)

In practice, a single CBA may assess options with **different analysis periods** due to the assets or interventions proposed having different periods of economic life, e.g., a dam versus a desalination plant or a capital project versus a non-build option. However, when comparing projects, **the analysis period should be the same for all options** (even if assets have differing economic lives) **and should have the same base year** for calculating present values.

The analysis period for each option should match when options are **mutually exclusive** (i.e., different versions of the same project, where only one would be implemented). If options have different economic lifespans, then adjustments need to be made to ensure NPVs are comparable. Analysts can either:

- model the shorter option as a repeated initiative (with roll-over or replacement)<sup>39</sup> through the lifespan of the longer option (up to a common multiple in years for both), or
- calculate an equivalent annual value for each option.<sup>40</sup>

The BCR is valid when comparing independent initiatives with different analysis periods.

### When it differs with the asset life (residual value)

In general, the analysis period for an initiative should match the lifespan of the key assets delivered, meaning the default assumption is usually that assets reach the end of their economic life by the end of the analysis period and have zero residual value. Alternatively, the asset may reach the end of its economic life but has a 'scrap' value, which can be counted as a benefit at the end of the analysis period.

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<sup>39</sup> Note: For simplicity, this method assumes identical versions of the project are roll-over or replaced. This may not be observed in reality if a more efficient or enhanced version of the project would likely be available in the future. Clearly, more flexibility, reduced risk, and potential for technology advancements may be associated with the project that is repeated more. Theoretically, there may be benefits associated with these considerations (see Boardman et al 2018 s 9.4), but it is difficult to determine both the sign and magnitude of option value (see Boardman et al 2018 s 12.2).

<sup>40</sup> Convert option NPV into an annuity:  $EAV = (SDR \times NPV) \div (1 - (1 + SDR)^{-N})$ ; where N is time (i.e. the analysis period), SDR is the discount rate. Treasury can provide support with this approach if required.

In cases where an asset has not reached the end of its useful life in the analysis period, a residual value benefit should be included if the asset is still of use or there is a market for its resale. Residual values may be based on the lesser of replacement cost, considering the age of the asset, or the remaining present value of net future benefits attributable to the asset beyond the analysis period.

The most common (practical) approach to account for residual value is applying straight-line depreciation to the asset's lifespan. Analysts should ensure realistic assumptions on asset lifespans are used. Supporting information on the effective life of assets may be found using ATO rulings or official guidance from agency corporate finance teams.

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## A3.2 Treatment of the factors of production

### Capital (pre-existing buildings or plant)

Any plant used in the initiative should be valued at its value in alternative use. Sale value may be used for highly marketable assets (e.g., motor vehicles). Where resale markets do not exist, the particular plant may be valued by the lesser of either the:

- estimated present value of the plant's savings or revenue earnings potential in its current location or activity, or
- current replacement value of the plant, i.e., not the book value of the plant, adjusted for the residual life of the existing plant where appropriate.

### Overheads

Overheads such as supervision, administrative costs, printing, and stationery, are also included in costs if they differ between options and the base case. Material overhead costs associated with purchasing, storing, and transporting materials needed for the project or program will also be relevant.

### Labour

**The cost of labour in a CBA is its opportunity cost, which is the reservation wage.** That is, the lowest wage rate that a worker would be willing to accept for doing a particular job in a particular location. The reservation wage differs between employed and unemployed (or underemployed) persons.

Where an initiative uses **in-house labour**, the value of existing labour resources and any additional labour (i.e., new hires) allocated to the initiative should be included in the initiative's costs. For practicality, the cost of in-house labour can be assumed to be equal to actual wages and on-costs of the employees.

Labour on-costs (e.g., superannuation, workers' compensation, long service leave and other statutory or contractual obligations of an employer that comprise part of labour-related expenses) are incremental, unavoidable costs that are added to direct labour costs and included in cost and/or savings estimates.

Where an agency uses subcontractors, the agency should, where possible to obtain, include in the cost estimate a breakdown of the amount to be subcontracted into separate components for labour, capital, and other significant cost categories. This would facilitate comparison with other procurement options.

### Returns to NSW labour

As discussed in Chapter 2, factors of production such as labour may receive payments over and above the minimum amount that is required to obtain their use. Labour surplus can theoretically be



generated by an initiative causing either increases in wages or increases in employment, for example:

- If an initiative increases demand for NSW labour — whose supply is somewhat inelastic — wage rates may be higher than the employees' reservation wage and the incremental increase would therefore be a labour surplus benefit.
- If an initiative increases employment, this can result in a labour surplus benefit provided that the **workers employed do not displace workers employed elsewhere** in the economy.

In a competitive labour market, it is unlikely an initiative will cause **ongoing** changes in labour surplus compared to whole-of-economy structural reforms. Impacts on **labour surpluses from an initiative are likely to be medium term** (when the economy can be assumed to find a new equilibrium).<sup>41</sup>

Some initiatives may attract new workers from outside New South Wales. If including workers from outside New South Wales, labour surplus for those workers should be **reported separately** for workers currently in New South Wales and workers expected to re-locate to New South Wales, as the latter are generally considered to be outside the referent group.

## Land in CBA

### Opportunity cost of land

A project may use land, buildings or plant already owned by a government agency, for which no payment will be made. In these cases, **the opportunity cost of the assets should still be included in the CBA.**

**For land and buildings, CBA should use a valuation based on the most profitable alternative use (see Box A3.1).** In some cases, this may mean considering realistic changes to zoning that could occur in the near future.

#### Box A3.1: Land valuation data

Expert advice on land valuation is available from the NSW Valuer General (NSW VG).

The NSW VG provides land valuations through their website for all land in New South Wales (see <https://www.valuergeneral.nsw.gov.au/>). Their valuation approach values land as if it was vacant, based on its highest and best permitted use, given current zoning, and planning restrictions. Generally, published NSW VG land valuations should be used in CBA unless:

- the initiative is very large and land use change is a key outcome (e.g., urban renewal or city-shaping public transport), in which case expert advice should be sought
- the published NSW VG valuation does not reflect the latest conditions or land use changes (zoning and planning) in the area
- there is a specific land use change identified in the project that is more realistic as a likely highest value to be used.

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41 Bartik TJ (2015) 'The social value of job loss and its effect on the costs of U.S. environmental regulations'. *Review of Environmental Economics and Policy*, 9(2):179–197.

## Land value uplift

Land values may be influenced by an initiative if it makes an area more (or less) accessible or attractive to live or work in. The Guide refers to this as land value uplift. **Typically, land value uplift is a result of the benefits delivered by an initiative.**

For example, an improvement to a public park may result in land value uplift for nearby homes because residents can use the improved park. The value of using the park is capitalised into land values. However, a CBA of the park improvement will directly measure the benefit to users of visiting the park, based on their use values. Therefore, directly counting use value and land value uplift in the CBA would amount to including the same benefits twice.

**Generally, CBA should directly measure the value of benefits and exclude land value uplift in order to avoid double-counting.**

The exception may be instances where directly monetising benefits is not feasible and land value uplift is a useful proxy measure (e.g., hedonic analysis). Land value uplift is likely to reflect a combination of factors in uncertain proportions, so it is preferable to use only land value uplift **or** only direct measurement of benefits, rather than a combination of techniques to measure different benefit streams.

## Higher value land use (HVLU)

Land value impacts can also enter a CBA through changes in land use. Some initiatives may change the amount or type of floor space (e.g., housing or offices) that can be delivered on a given piece of land. It is most common in large transport projects where development opportunities previously unviable due to network congestion or capacity constraints are now unlocked.

The Guide refers to this as higher value land use. Forecasting and valuing higher value land use is a complex and evolving practice (see Box A3.2). Australian Transport Assessment and Planning guidance (O8 Land Use Benefits) is a valuable resource that contains significant additional details. Higher value land use benefits are difficult to predict and attribute to specific interventions. All costs required to realise the higher value land use impacts must also be considered.

**The Guide recommends that separate CBA results are presented excluding and including higher value land use benefits.**

### Box A3.2: Key points to consider for higher value land use

#### Land use changes in the base case

- Rezoning, development, and timing assumptions without the initiative.

#### Current potential may exceed current reality

- In some cases, the current level of development in the project area may be lower than the maximum allowed under existing planning limits.
- This may be because there is insufficient infrastructure to support further development.
- If so, then an initiative that addresses the relevant infrastructure constraints may be able to ‘unlock’ further development even without a change to planning limits.
- However, the CBA should also consider whether the level of infrastructure, and therefore level of development, might also increase in the future in the base case.

## Box A3.2 continued: Key points to consider for higher value land use

### Attribution

- Only changes in land use above and beyond the base case land use can be attributed to the initiative.
- As discussed above, the base case level of development may be higher in the future than it is at present, particularly if there are complementary initiatives occurring in the base case.

### Developer costs and benefits

- Unless there is project-specific evidence to the contrary, the CBA should assume developers will earn an industry 'normal' return on developments undertaken due to the initiative.
- Earning a normal return means the developer's opportunity cost of undertaking the development is equal to the benefits they earn. Consequently, the net benefit to the developer from a CBA perspective can potentially be assumed to be zero.

### Accounting for value of existing capital demolished

- New developments may involve replacing existing buildings earlier than they would be replaced in the base case. This cost should be accounted for in higher value land use calculations.
- The value of existing capital demolished can be challenging to estimate in practice, but best efforts should be made and all assumptions clearly documented.

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## A3.3 Practical issues in CBA

### Double counting of benefits

The risk of double counting can arise across many aspects of CBA modelling. Some examples include:

- Impacts of an initiative are incorporated in subsequent valuations of assets or in market prices (see land value uplift discussion in Section 3.2) and both are included in the CBA. For example, directly measuring use value, amenity, and heat mitigation benefits from a new park and also including increased property values near the park as a benefit.
- Transfer payments between groups are not explicitly considered. For example, measuring the consumer's willingness to pay for a new public transport service as a benefit and adding the revenue collected by the provider as a separate, additional benefit. To avoid double-counting, the consumer benefit should be the consumer surplus (i.e., willingness to pay less price).
- There are multiple methods for measuring the same benefit, but these are not mutually exclusive. For example, an energy efficiency project could measure the benefit through valuing consumer savings based on retail energy prices, **or** it could measure the benefit based on avoided costs through the energy supply chain (lower generation costs, transmission and distribution infrastructure costs and retail costs).
- A Logic Model was not developed and there is confusion of specific, incremental changes in outcomes (therefore benefits) between the base case and project case. The quantification

approach for each benefit category may not be specific enough and therefore risks double-counting across other benefit categories.

## Taking a conservative approach

In some instances, due to low confidence in supporting data (see Box A3.3) some forecasts or valuations may be less reliable. In these cases, analysts may consider **taking a conservative approach** when making assumptions about what data is used, which may ensure reliance on ‘things going right’ is reduced. Note, taking a conservative approach **departs from the expected (average) value approach** discussed in Appendix 2 and should be applied cautiously.

This does not mean using values outside the expected values approach, but where confidence in the forecast or valuation is low, then a conservative treatment (i.e., using a parameter at the lower-end of the available range of estimates) may be prudent. If this approach is taken it should be clearly discussed.

### Box A3.3: Signs indicating low confidence in forecast estimates

- The range of results is large (indicated by the standard deviation units).
- The assumptions used are not strongly grounded by research or evidence.
- The evidence used is not relevant or valid (as discussed in Appendix 1.3) to the initiative.
- The available evidence is dated, e.g., over 10-years and especially over 20-years old.
- The results cannot be explained or validated.

## Wider Economic Impacts

Wider Economic Impacts<sup>42</sup> (WEIs) relate specifically to city-shaping projects where changes in urban density may change productivity. These are predominantly associated with major transport projects and urban re-development but could theoretically exist for other transformational projects like precincts spanning across many sectors. Deriving estimates of WEIs will only be worthwhile and justified where changes in urban density can be realistically expected.

Efforts to quantify WEIs have focused largely on measuring increased output due to agglomeration economies, based on the concept of ‘effective density’ of a location.<sup>43</sup> ‘Effective density’ is defined as the employment in and around the specific project area, weighted by proximity (that declines with generalised cost of travel) to the location. Effective density generally applies to urban areas only, as it is unlikely for rural areas to generate WEIs, unless the initiative improves transport routes between a rural and urban area.

However, as has been observed, ‘Productivity certainly attracts population ... the basic problem with estimating agglomeration effects on productivity is that population density is not exogenous. People move to places that are more productive.’<sup>44</sup> Therefore, density and productivity may be simultaneously determined by some other factor.

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42 Also known as Wider Economic Benefits (WEBs).

43 UK Department for Transport (2006) *Transport, Wider Economic Benefits, and Impacts on GDP*, <http://webarchive.nationalarchives.gov.uk/20080306143059/http://www.dft.gov.uk/pgr/economics/rdg/webia/webmethodology/>.

44 Glaeser E (2010) ‘Introduction’ to *agglomeration economics*, ed. Glaeser, University of Chicago press, 13-14. As referenced in Abelson P (2021) ‘A critical review of the wider economic benefits of transport infrastructure’, *International Journal of Economics & Management Sciences*, 10:608.

The existence of WEIs requires a ‘narrative’ to justify their realism and inclusion in CBA estimates. WEI analysis aims to measure benefits not normally captured by travel time savings in CBA. Box A3.4 identifies the main types of WEIs.

### Box A3.4: Types of Wider Economic Impacts

There are four categories of WEIs, but the three main categories are:

- Agglomeration economies (WEI 1) – benefits of improved productivity derived from higher employment density, input and labour markets which offer the firm greater choice, and greater access to knowledge and technology of other firms.
  - Dynamic clustering reflects the location choices of firms.
  - Static clustering relates to improvements in transport network performance.
- Labour market and tax impacts (WEI 2) – benefits of lower transports costs enable greater labour force participation, increased hours worked, or allocation of workers to higher productivity jobs.
  - WEI 2a (only) relates to a change in labour supply.
- Output changes in imperfectly competitive markets (WEI 3) – a reduction in transport costs causing an increase in production or output of goods or services that use transport.

**There are substantial practical issues in quantifying WEIs**, including the availability of relevant data, the validity of the measures used, the conclusions that can be drawn from them, and the high risk of double counting some economic benefits.

Further, the size and direction of WEI can differ strongly across projects and a transport project can give rise to agglomeration costs due to dispersion of jobs and housing. A discussion on the **net increase** in agglomeration effects for the initiative would contribute to the narrative for WEI’s inclusion in the CBA.

Given the uncertain nature and the high potential to double count benefits, **WEIs for relevant projects should be excluded from the central estimate of a CBA and be shown separately as a sensitivity analysis.**

### Plausibility checks for estimates of costs and benefits

**CBAs should demonstrate that the estimate of costs and benefits of the options are reasonable**, particularly where:

- there is a high degree of uncertainty regarding the size or time path of benefits or costs
- the bulk of total benefits or costs are attributable to a single category of benefit or cost
- the project has a significantly higher BCR than other similar projects.

Some examples of threshold analysis that might be undertaken include cost per user or service and cost differences between options.

### Cost per user or service

If benefits cannot be valued, it may be possible to use the net present cost of a proposal to determine the likely cost per user over the life of the proposal. If this amount exceeds the likely benefit to each user (for instance, measured by their total ‘willingness to pay’, if this measure is available), then the proposal is unlikely to be reasonable or plausible. **The basis for comparison**

between likely net present cost and benefit should be clear and consistent (e.g., per user, per service, once-off, ongoing etc.).

For example, consider a proposal to provide free services to users at a net present cost of \$10 million:

- If the proposal were to benefit 10 million users, the unit cost would be \$1 per user. In the absence of empirical evidence, it could be reasonably inferred that the benefit per user is likely to outweigh the cost and that users or the community would be willing to pay \$1.
- Conversely, if the cost per user was \$100 and it would be unrealistic to assume that users would be willing to pay \$100 each when a cheaper and better alternative exists, then the proposal would fail the reasonableness check.

The estimated likely net present cost should also be benchmarked against other comparable sample projects, where applicable, using the same comparison basis. For example, the cost of rail infrastructure per track kilometre could be benchmarked against other comparable rail projects and known sample unit cost rates to identify any potential issues in scoping or efficiency.

### Cost differences between options

These could be compared to determine whether the additional cost is reasonable. For example, assume two options where Option A offers improved service levels compared to Option B. If the improved service levels of Option A are relatively minor but would incur a significantly increased cost, a reasonableness check would likely rule out Option A.

### The difference between economic output and welfare

On some occasions when estimating the effects of government initiatives, analysts may misinterpret the value of a change in production by an industry (i.e., output or value added) as a benefit that improves welfare to society. Social welfare and economic output are not the same, although a relationship exists between the two.

Direct measurement of changes in economic activity, for example, **Gross Value Added (GVA)** data from National Accounts reflecting changes in industry output **should not be included in CBA as it does not measure welfare.**

When it is difficult to directly estimate benefits it is, however, possible **to convert GVA into a proxy** for social welfare benefits by accounting for the opportunity cost of the resources used in production of goods and services. Therefore, **only a portion of GVA increase will be a welfare gain** (e.g., producer and labour surplus).

Note that this approach **cannot account for non-monetary welfare impacts** (i.e., externalities) either positive or negative, which need to be measured separately.

Undertaking this type of analysis may be helpful when estimating economic surplus, for example, predicting changes to existing or new business surplus or surpluses to industry from public investment. In some cases, the specific businesses impacted may not be known but the industry or industries expected to be affected by public investment is known or indicated.

Treasury should be consulted as specialist support is likely required to do this analysis.

### Treatment of Commonwealth Government funding

NSW Government initiatives may receive funding from the Commonwealth Government. Commonwealth Government funding is provided to all states and territories for specific and general purposes. CBA considers the efficient use of resources to improve welfare, but two considerations are relevant for this issue:



- **Referent group:** CBA in this Guide includes resource costs and benefits to NSW residents only.
- **Base case:** Outcomes of an initiative are considered relative to the base case, hence should cause incremental changes to welfare.

If Commonwealth Government funding for an initiative would have been received by New South Wales in the base case (possibly for an alternative initiative), then it should be treated no differently to NSW funding. Investing the Commonwealth Government funding in this initiative has an opportunity cost equal to the full value of the funds. For example:

- funds disbursed under an established funding agreement or regular co-funding arrangement
- payments that will result in New South Wales receiving a lower share of GST, or a reduction in other untied grants.

If Commonwealth Government funding for an initiative will only be received in the case where that initiative proceeds, for example funds secured through a competitive grant application process, then the funding is an injection of resources into New South Wales relative to the base case. In this specific case, the Commonwealth Government funds are costless resources from a NSW perspective (i.e., investing the funds in that initiative carries no opportunity cost), so the value of the funds can be included in the CBA as an offset to the initiative's costs.

Note, submitting a project for Commonwealth Government funding that has a low BCR from an Australian perspective but high BCR from a NSW perspective could potentially reduce the likelihood of grant success. Further, it is not clear that the marginal cost of the Commonwealth Government funding has no impact on New South Wales, given New South Wales constitutes around a third of Australia.

For transparency, **sensitivity analysis treating the Commonwealth Government funding as NSW funding** is recommended to understand the difference in the results this treatment makes from a state versus national perspective.

## A3.4 Carbon Emissions

### Cost of carbon emissions

Human activities can increase carbon dioxide emissions, which have harmful effects on climate and affect third parties in a negative way. Third party costs on the referent group are included in CBA. **Potential climate change impacts should be assessed like any other risk factors** that affect the economic life cycle of assets, as part of an agency's ongoing risk management and decision making for both existing and new assets.

The cost of CO<sub>2</sub> emissions (and other emissions measured in CO<sub>2</sub> equivalent emissions), or the benefits of reduced CO<sub>2</sub> emissions, should be included in a CBA where the cost or benefit is likely to materially affect the NPV and BCR.

The creation of a carbon value is outside the scope of these guidelines. However, there are three common ways to value carbon emissions:

- **Social cost of carbon** (or damage costs) modelling quantifies the amount of damage caused by marginal additional emissions. The cost reflects the value of damage caused by allowing an extra unit of emission. This cost can be calculated to estimate the damage caused globally, or the damage to a particular jurisdiction.
- **Marginal abatement cost** modelling (i.e., a target consistent approach) estimates the marginal cost of reducing emissions along a trajectory necessary to reach a defined emissions reduction target in future.

- **Market prices** (effectively another form of target consistent approach) quantify the cost of carbon emissions within specific policy settings. Where a market is designed to achieve an emissions target (for example, through a cap-and-trade arrangement) the market will provide a value for the cost of abatement necessary to reach that target. This approach is less reliant on modelling assumptions, but its reliability is influenced by choices in market design.

The cost of negative externalities can effectively be quantified by reference to the damage caused by these externalities. By this reasoning, **damage costs** (such as from sea level rise, increased fires and flooding, and reduced productivity) most consistently reflect the approach taken to assessing externalities in a CBA. However, there are several difficulties with a damage cost approach:

- There is no agreement on the modelling assumptions underlying a damage cost approach, and estimates produced and adopted in other jurisdictions vary widely.
- While justifiable due to international treaties recognised by the NSW Government, and the expectation of reciprocity, presenting costs as the global damage that would result from an action does not align with the concepts of standing used in other parts of NSW CBA guidelines.
- Internationally, jurisdictions appear to be moving towards the third approach (a **target consistent** approach).

A damage cost approach is therefore not preferred at this time.

Both the New South Wales and Federal Governments have adopted emissions reduction targets. However, at this time, neither level of Government has adopted a price for carbon emissions to achieve these targets. International examples of prices include:

- The World Bank and the Intergovernmental Panel on Climate Change within the United Nations have produced global abatement cost estimates.
- The European Union Emissions Trading System is the world's largest carbon market. While this market has specific design features that reflect jurisdictional factors, as of 2022, the prices of European Union carbon permits fall within the band of prices estimated by jurisdictions adopting social cost and abatement cost methodologies.

The following principles should guide the quantification of the cost of carbon emissions for a CBA:

- A comprehensive Australian emissions market would value carbon emissions consistently with Australian targets, abatement opportunities, and opportunity costs. Value would be revealed by market participants rather than through modelling assumptions. No such market is, however, currently in operation.
- In the absence of a reliable Australian market, a cost modelled in line with a target consistent approach, produced and adopted by the New South Wales or Commonwealth Government, should be used as a basis for valuing the costs of carbon emissions. Such a value estimate may be developed in the future as jurisdictions continue to develop their emissions policy.
- In the absence of the above, existing market prices from the market that most comprehensively prices emissions (e.g., the European Union carbon permit market) can be used as a proxy valuation. A CBA using carbon market prices should use an annual average price over the most recent complete calendar or financial year, in Australian dollars.

While these principles will allow appraisals to apply a carbon value that is consistent with these guidelines, **Treasury will provide supplementary guidance to improve consistency, see Technical Notes: Carbon emissions value for CBA guidance.** This guidance will set out a value that can be used for a stated period, and is expected to be updated semi-annually, or as new information becomes available.

If some value of carbon is already incorporated into market prices, then in principle, the cost of the externality is reduced to that extent. In many cases however, this may be impractical to quantify.



## Scope of relevant emissions

The emissions impacts given standing in a CBA should include the emissions that occur within New South Wales. Each tonne of carbon that occurs in New South Wales should be counted **as a whole and not pro-rated by population or any other factor**. This approach is intended to be consistent with the concept of standing that is generally applied throughout this guide. It includes emissions directly produced or mitigated by a program, as well as the emission impacts from changes in behaviour within New South Wales that result from the program. This approach is also intended to be broadly consistent with the emissions taken into account for the reduction target that New South Wales has committed to, and which would be used in developing a target consistent price.

Examples of relevant impacts include:

- emissions from the combustion of fuels within New South Wales, whether as part of the program, for the purposes of generating electricity for the program, or by NSW residents as a result of the program
- emissions from the manufacture or disposal of products within New South Wales
- emissions arising from the use of NSW land.

Emissions from the use of products produced in New South Wales but consumed elsewhere, and emissions from materials or inputs sourced from outside of New South Wales would generally not be included in the CBA.

In practice, the origin of construction materials will generally be unknown at the time of the CBA. To ensure consistent practices, all CBAs are therefore required to make a technical assumption to include emissions arising from the use of construction materials (known as embodied emissions) regardless of where the materials are produced.

As emission reduction policies such as carbon markets develop, the prices of these products will adjust accordingly. Over time, this is likely to reduce the need to separately incorporate emissions values.

## Escalation and sensitivity testing

Models of social costs of carbon and marginal abatement costs show an escalation of costs over time. This is also generally reflected in market futures prices. This is because of modelling assumptions around the amount of damage caused by additional emissions, and the depletion of the least costly abatement opportunities.

While escalation rates vary across different models and methodologies, typical annualised rate increases are in the order of 1.5 to 3 per cent. For simplicity, **carbon costs should be escalated at a rate of 2.25 per cent per year** in real terms unless reasonable arguments are presented for the use of a different escalation factor. The aforementioned **Technical Note** includes guidance on escalation to ensure that material new information can be incorporated as needed.

**Sensitivity analysis is mandated in this Guide and should be applied to consider the implications of adopting a different carbon price.** Appropriate prices to use for sensitivity testing includes damage cost or target-based estimates from major comparable jurisdictions (e.g., New Zealand, Canada) or international organisations (e.g., Intergovernmental Panel on Climate Change and/or World Bank). Where market prices are used, sensitivity may also consider the implications of using high or low market prices over a recent period. The impact of a zero price should also be tested for completeness.

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## A3.5 Items that should be excluded from CBA

### Sunk Costs

All costs in a CBA relate to new (i.e., forward looking) expenditures incremental to the Base Case only. **All past or sunk costs should be excluded from the analysis.**

### Depreciation

Depreciation is an accounting method that reflects the cost of consumption of capital over time. In CBA, capital costs should be included at the time of expenditure (representing the opportunity cost of resources used). **Depreciation should not be included as a cost in a CBA because this would double count capital costs.**

### Interest

**Interest costs are excluded from costs in a CBA.** As future costs and benefits are discounted to present value terms, the discount rate already reflects the use of capital resources over time. Discounting converts a flow of future funds into an equivalent, up-front value. Including interest cost or dividend returns to equity would double count the cost of capital implicit in the discount rate.

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## A3.6 Transfer payments

### Transfer payments

**Transfer payments**<sup>45</sup> are financial transfers between people or businesses within New South Wales. For example, a cash rebate paid from the Government to a resident. A transfer payment incurs a financial cost for the payer and an exactly equivalent financial benefit for the payee. Therefore, transfer payments on their own do not result in resource costs or benefits.

In general, transfer payments should be:

- **excluded from CBA results**, as they do not impact net benefits
- **included in distributional analysis**, see Appendix 5.2.

The presence of transfer payments can, however, complicate the calculation of **net benefits** for CBA. Generally, there are two approaches towards isolating net benefits in the presence of transfer payments:

- Directly comparing the total value of incremental benefits (typically valued through total willingness-to-pay) to the total value of incremental resource costs used to produce the benefits, or
- Calculating the net surplus received by each group (e.g., consumers, producers) after transfer payments have been made.

Box A3.5 illustrates these two approaches through a hypothetical numerical example.

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<sup>45</sup> Note: transfer payments here are an unrelated concept to 'benefit transfers'.

### Box A3.5: Illustrative example of approaches to calculating net benefit

The government is providing a service to one consumer. For the service:

- the consumer is willing-to-pay \$10 (i.e., they value the service at \$10)
- the service costs \$3 (in real resource costs) to provide
- the government is charging the consumer \$6 to access the service.

The payment of \$6 from the consumer to the Government is a transfer payment because it is not reflective of the economic cost of service provision. There are two approaches towards the calculation of the net benefit of the service; both provide the correct answer:

Direct approach:

- net benefit is equal to total WTP minus total resource cost
- net benefit = \$10 - \$3 = \$7.

Surplus approach (also known as resource cost correction approach):

- net benefit is equal to the consumer's surplus plus the government's surplus
- consumer surplus is equal to WTP minus price paid
- government surplus is equal to price received minus resource cost.

Net benefit = (\$10 - \$6) + (\$6 - \$3) = \$7.

Whichever approach is taken, the CBA needs to clearly identify where transfer payments have been quantified and analysts should take care to avoid either double-counting or under-counting benefits in the presence of transfer payments.

### Treatment of grants and vouchers

Some initiatives involve the government making a direct financial payment to households, businesses, local councils, or non-government organisations to achieve a policy outcome. For example, grants to businesses to conduct research and development or vouchers distributed to households to fund activities like children's co-curriculars.

For CBA of these types of initiatives, the financial cost of the payments made by the government should be included in the CBA result as a resource cost (because they have an opportunity cost of not being invested elsewhere).

The financial payment received by the recipient should be included in the CBA as a benefit. The size of the benefit for the recipient will depend on how they are expected to (or are allowed to) spend their payment.

For example, an unconditional financial payment could be assumed to have benefits to the recipient exactly equal to the size of the payment. A payment that is tied to certain conditions (e.g., can only be spent on certain things), however, may be valued by the recipient at less than the financial value of the payment.

## Treatment of taxes and subsidies

**Taxes (and subsidies) are transfer payments**<sup>46</sup> which increase (or reduce) the prices faced by producers and consumers. Generally, the payment of taxes and subsidies should be excluded from economic costs because they do not represent a resource cost.

Taxes may be included in WTP valuations when they form part of the price a consumer is willing to pay for something. Indirect taxes on inputs (e.g., GST) such as construction costs and taxes on profits (producer surplus) are usually excluded from CBA.

The impact, and therefore CBA treatment, of taxes and subsidies will depend on the **balance between additional effects** (i.e., net increases in output attributable to the initiative) **and displacement effects of the initiative** (i.e., increases in output displacing other output that would be produced).

Box A3.6 below summarises various taxation mechanisms and associated treatments in a CBA, with New South Wales as the referent group.

### Box A3.6: Summary of tax treatments in CBA from initiatives generating additional revenue

#### State Government taxes (e.g., Payroll tax, land tax and stamp duty etc.)

- **From NSW entities:** Generally, NSW taxation revenue paid by NSW entities is a transfer payment. In cases where an initiative generates additional economic activity (relative to the base case) that results in incremental changes to taxation revenue, taxes should be accounted for similarly to other transfer payments using one of the two approaches illustrated in Box A3.5.
- **From non-NSW entities:** If an initiative generates additional economic activity (relative to the base case) that results in additional NSW taxation revenue being paid by non-NSW entities, then this revenue represents an injection of funds into New South Wales and therefore may be a benefit in the CBA.

#### Local Government taxes

- **Council rates:** Levied by Local Government on property owners. If council rates are relevant to a CBA, they should be treated in the same way as NSW taxes.

#### Commonwealth Government taxes

- The impact on New South Wales of additional tax revenue paid to the Commonwealth Government cannot be estimated accurately. **Generally**, this revenue is considered to not accrue to the NSW referent group and therefore not represent benefits in CBA.
- For practical purposes, surpluses in CBA should be undertaken on a pre-income tax basis (personal and corporate income tax).
- **Goods and services tax (GST):** GST is collected by the Commonwealth Government but re-distributed directly to the states and territories. Therefore, part of each dollar of additional GST raised in Australia is received directly by New South Wales. For practical purposes, CBA should assume that New South Wales receives 32 per cent of additional GST revenue (roughly equal to New South Wales' share of Australia's population) raised as a result of an initiative.

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<sup>46</sup> Taxation takes part of the income of private parties and transfers it to a government, which in turn pays subsidies (welfare benefits or concessions) or provides goods and services to private parties. Those who pay the tax are not necessarily the same parties who receive the benefits.

## Excess burden of taxation

Revenue from taxation provides the majority of government funds, hence government's initiatives are usually considered to be funded by taxpayers. The cost of general taxation is the deadweight loss (or excess burden) to society from distortions to resource allocation that lead to a loss of welfare. For example, payroll tax thresholds could lead to reduced incentives for businesses to grow as they are only required to pay payroll tax above a given level of total wage payments. Collecting taxes also carries administration and compliance costs.

From the perspective of CBA, Government funds are usually raised in advance of an approval. Because CBA is forward-looking, unless there is a change in taxation arrangements attached to the initiative, then total deadweight loss will be the same going forwards (i.e., taxation arrangements will be the same) between the base case and option case.<sup>47</sup>

Consequently, this Guide recommends that **the excess burden of taxation does not need to be reported in the central CBA result or sensitivity analysis, unless requested by Treasury.**

For initiatives involving changes to taxation arrangements (e.g., a new or revised tax or change in tax rate), deadweight loss from taxation itself is the major consideration in the CBA and hence is required in the analysis.

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## A3.7 Additionality, Displacement, and Leakages

The volume and valuation parameters in CBA modelling should properly consider marginal impacts and incremental analysis. Non-NSW entities may also be impacted by an initiative. Estimating benefits to the NSW referent group therefore requires consideration of **additionality, displacement, and leakages.**

### Additionality

Additionality is a concept used to account for net increases in benefits, that is, an increase in benefits to the referent group with the initiative relative to the base case. Consideration of the base case is essential to determine true additionality.

### Displacement

Displacement occurs when another activity is 'crowded out', relocated, or partially reduced somewhere else in New South Wales, e.g., where a supported NSW business takes market share away from an unsupported NSW business. Displacement can affect producers, consumers, and labour. Crowding out may be less likely when an initiative impacts a tradeable sector of the economy (i.e., a sector with a significant proportion of imports or exports) rather than local sectors that service a smaller community. Crowding out is more likely to occur when the economy is close to full capacity or unemployment is low, and less likely when there is spare capacity.

### Leakages

Leakage is the extent to which benefits generated in New South Wales 'leak out' to other jurisdictions. For example, consider a business operating in New South Wales but owned predominately by overseas shareholders. Profits that are generated in New South Wales by this

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<sup>47</sup> Mishan EJ and Quah E (2021) *Cost-Benefit Analysis*, 6th ed. Routledge, 167, describe the excess burden concept as something of 'a green mare's nest' and do not advocate for its inclusion when considering how an initiative is financed. This view is not universally held in other textbooks (e.g. Boardman et al 2018) and similarly in official guidance (e.g. the HM Green Book excludes DWL, but the OMB Circular A-94 Guidelines and discount rates for benefit-cost analysis of Federal programs requires supplementary analysis with a 25 per cent excess burden).

business accrue to or leak out to the overseas owners, rather than to the NSW community. This type of leakage is excluded as a benefit from the CBA.

# Appendix 4: Dealing with uncertainty in CBA

All initiatives are subject to risk and uncertainty to different degrees. This appendix explains:

- the difference between risk and uncertainty
- why risk and uncertainty need to be accounted for to produce an accurate BCR
- methods for accounting for risk and uncertainty and producing a probabilistic CBA result – focusing on the use of Monte Carlo Analysis.

Monte Carlo Analysis may initially seem complex, but its undertaking is increasingly approachable and feasible. Appropriate use of Monte Carlo Analysis can move a CBA closer to best practice.

Real Options Analysis can be a valuable supplement to Monte Carlo Analysis – offering the potential to alter the scope or timing of an initiative so it is less exposed to downside risks and more exposed to upside risks.

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## A4.1 Concepts of risk and uncertainty

### Difference between risk and uncertainty

Risk and uncertainty can have different meanings. A common distinction is whether possible future events can be objectively quantified using historical observations.

**Risk** occurs when probabilities can be assigned to uncertain future events. These probabilities can be either assigned objectively, based on historical observations, or can be based on subjective probabilities where historical data is not available or applicable.<sup>48</sup> **Risk is therefore quantifiable.**

Most costs and benefits in *ex ante* CBA will be associated with some degree of risk, as predicting the future is inherently uncertain. Risk can fall into several categories, such as those that:

- are manageable or open to mitigation
- have a very low probability of occurring but incur a very high cost if they eventuate ('catastrophic' events)
- have relatively manageable costs but a relatively high probability of occurring.

**Uncertainty** occurs when probabilities cannot be reasonably assigned to possible future events. **Uncertainty is therefore unquantifiable.**

For example, predicting technological change may be impacted by uncertainty, as we anticipate technological change will happen, but we cannot predict what it will be or assign a probability to different paths of technological change.

Uncertain events like technological change are outside the initiative team's control and could change outcomes or even fundamental assumptions that underpin a service need, if the 'future state' could be different to that assumed during the proposal development.

### 'Knowns' and 'unknowns'

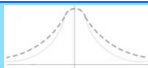



Risk and uncertainty can be described with reference to what is known and what is unknown. Table A4.1 below presents combinations of 'knowns' and 'unknowns' along with methods that can account for risk and uncertainty in each situation.

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<sup>48</sup> Subjective probabilities is a type of probability derived from an individual's judgement or own experience about whether a specific outcome is likely to occur.



Table A4.1. Knightian Matrix of knowns and unknowns

<b>Known Unknowns</b> 	<b>Known Knowns</b> 
<p>Risks and distributions are known and can be estimated but not with certainty about the range of possible outcomes as the extent to which these risks will materialise and the way that it may impact an initiative is unknown.</p> <p>These issues are known as 'model uncertainty' or 'parameter uncertainty' and can be addressed through ongoing improvement processes to models, such as the testing and calibration of forecasting models, and reference class forecasting.</p> <p>Example: for many initiatives, proponents know that there is a risk of flood, wildfire, cost overrun, patronage shortfalls, or climate risks, but we are uncertain of their severity, frequency, and timing. Floods and cost overruns may follow an estimated 'fat tail' distribution but occur more frequently and severely than estimated. This challenge can arise from data limitations but also because the risks are hidden in low-frequency high-consequence events known as 'tail events'.</p> <p><b>To help manage 'known unknowns' proponents can test the sensitivity of assumptions about risks (relevant to the project) through Monte Carlo analysis but also scenario analysis to understand what happens to an initiative if a risk is not quantified accurately.</b></p>	<p>It is possible to know the risks and probabilities, and to estimate the full distribution of possible outcomes with certainty — over repeated rounds the expected values of outcomes are known and consistent.</p> <p>The absence of uncertainty is a feature of dice games, where the value of the dice create certainty about the full range of possible outcomes and their likelihoods. Two dice can produce only real numbers between 2 and 12: creating upper and lower bounds for outcomes. The distributions of values within these bounds also follow a non-random process (for a large number of rolls).</p> <p>This certainty about the range of possible outcomes and their distribution is not possible when estimating natural disaster risk as it is impossible to know <u>with certainty</u> what the largest flood, earthquake, or storm event may be, or even what the magnitude of 1-in-500-year or 1-in-1000-year event is. In these 'open systems' we can only produce estimates subject to uncertainty.</p> <p>Example: quantity surveys for off-the-shelf non-bespoke or highly standardised products. Expected value measures are useful but also need the full distribution of possible outcomes.</p> <p><b>To deal with 'known knowns' proponents can develop probabilistic CBAs using Monte Carlo Analysis that present the full range of possible outcomes.</b></p>
<b>Unknown Unknowns</b> 	<b>Unknown Knowns</b> 
<p>The risks and unknowns and distributions cannot be estimated accurately as they are subject to developments outside of what can be formalised accurately in models, due to 'Black Swan' or 'White swan' events. Uncertainty plays a dominant role as it could change all expected outcomes for better or worse.</p> <p>While the source of uncertainty cannot be identified, it is possible to identify exposure to types of uncertainty, especially events that are low-frequency(rare) but high-impact and provide optionality to respond to such events.</p> <p>Example: while it may not be possible to know all the reasons why a business may need to require employees to work from home for 12 months (a set of 'unknowns') it is possible to know the ICT systems and management arrangements required to facilitate prolong working from home. Allowing managers to rollout video meeting software, move ICT systems to the cloud, and make other arrangements necessary for employees to access critical systems remotely.</p> <p><b>A combination of Monte Carlo Analysis and real options analysis can be very useful for insuring a project against 'unknown unknowns' — identifying the exposure of an initiative to future changes and altering the scope of timing of the initiative to manage this exposure.</b></p>	<p>These are risks that are known but which become 'unknown' because they are forgotten or receive insufficient attention — meaning that they are not reflected adequately in a CBA.</p> <p>These risks are referred to as 'risks you were supposed to know but it turns out that you did not know' due to some oversight or error such as: 'planning fallacy', climate risk, the presence of sublimines, or 'Optimism Bias'. These oversights can include cognitive biases but also other challenges humans face in appreciating the role of randomness. We become unconsciously blind to uncertainty as it is difficult to comprehend. So extra attention is needed to ensure that all risks are identified and accounted for.</p> <p>Example: the distribution of outcomes in cost estimates can differ from that observed in reality: underestimating the probability and consequence of overruns due to optimism bias, planning fallacy, or the presence of 'sublimines' — such as the 'technological sublime' or 'aesthetic sublime'.</p> <p><b>To avoid 'unknown knowns' proponents can work to identify all risks that may impact an initiative and test an initiatives exposure to these risks — ideally through Monte Carlo Analysis.</b></p>

## A4.2 Accounting for risk and uncertainty in CBA results

### CBA results should be based on expected values

Central CBA results, NPV and BCR, should generally be based on expected values (averages). Ideally, expected values will be calculated from a full probability distribution of possible outcomes, such as the distribution estimated by Monte Carlo Analysis. The expected value is the probability-weighted average of all outcomes in the distribution.



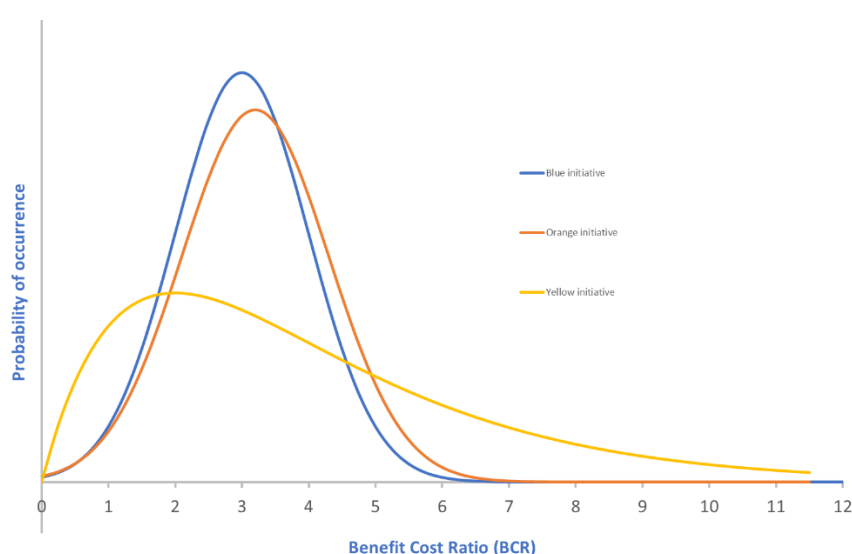
Where full probabilities are available, analysts are encouraged to consider using Monte Carlo Analysis, which is increasingly being incorporated as routine in CBAs to estimate expected value with greater precision. Monte Carlo Analysis is relatively low-cost and can be applied quickly.

In cases where estimating a full probability distribution is not feasible, simplified distributions can be used to derive expected values. For example, generating a 'three-point estimate' comprising a worst-case, most likely outcome and best-case with probability weights based on expert opinion, or taking a midpoint of several estimates.

### Accounting for risk and uncertainty is important to give a complete picture of CBA results

NPV and BCR results alone will not necessarily reflect the different risks and uncertainties faced by initiatives. It is possible for initiatives to have the same or similar central NPV and BCR result but very different distributions of possible outcomes. Figure A4.1 provides an illustrative example.

Figure A4.1. Illustrative example of probability density functions of BCR results for three hypothetical initiatives



The three hypothetical initiatives presented in Figure A4.1 have near-identical expected values for BCR but very different exposure to upside and downside risk. Looking at the expected BCR only would obscure the relatively low downside and high potential upside of the 'Yellow' initiative, which a decision-maker managing risk across a portfolio of initiatives may prefer to the risk profile of the 'Blue' or 'Orange' initiatives.

Accounting for risk and uncertainty in CBA is also critical for initiatives dealing with potentially catastrophic events such as natural disasters. Catastrophic events may have a very low probability of occurring in any single year but cause devastating losses if they occur with no mitigation measures in place.

Consequently, looking only at the central NPV and BCR of mitigation measures for catastrophic events may obscure their potential value to the community at risk. For these measures, it is important to present the full distribution of outcomes alongside the NPV and BCR.

### Cost estimates from probability distributions

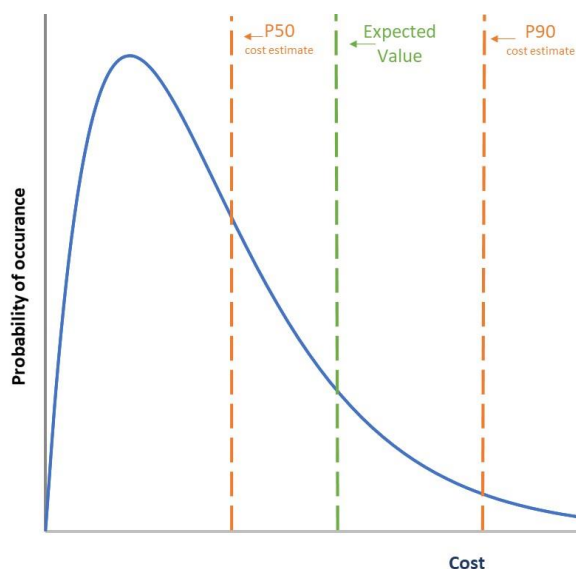
Cost estimates, usually for infrastructure initiatives, can be generated from a probability distribution of possible outcomes. This is a common use-case for Monte Carlo Analysis.

Probabilistic cost estimates will often report the median value, referred to as the 'P50 estimate' because there is a 50 per cent chance of the actual cost being equal to or lower than the P50

estimate. Similarly, a 'P90 estimate' can be produced, where there is a 90 per cent chance of the actual cost being equal to or lower than the P90 estimate.

For a symmetrical, normally distributed probability distribution, the median value and expected value will coincide. However, they will differ for a skewed or non-normal distribution. For a distribution skewed towards cost overruns, as depicted in Figure A4.2, the expected value will be higher than the median (and likely lower than P90).

Figure A2.2 Simple example of a probability cost distribution curve



## A4.3 Methods for accounting for risk and uncertainty in CBA

**Sensitivity analysis shows how CBA results vary with changes in assumptions or parameters.** It illustrates what could happen to costs and benefits if the assumptions made about some or all key variables prove to be different from central expectations.<sup>49</sup>

Testing the robustness of CBA results to changes in key parameter values provides crucial information for decision makers. In some cases, the results of sensitivity analysis could lead to a recommendation that varies from simply prioritising the option with highest NPV.

There are several methods for undertaking sensitivity analysis, this section discusses:

- Simple parameter testing
- Expected Net Present Value (ENPV)
- Monte Carlo Analysis
- Scenario planning

### Simple parameter testing

**Sensitivity analysis can be undertaken by varying a single parameter (or benefit category),** holding all others constant. Parameter testing should be tailored to the initiative, focusing on the key parameters or scenarios with material impacts on the reported benefits and costs.

<sup>49</sup> See: <https://www.panneldiscussions.net/2008/06/126-sensitivity-analysis-with-economic-models/> for a discussion on simple system to undertake sensitivity analysis.

The risk profile and key risk drivers for the initiative are a useful starting point for identifying parameters to test. In some cases, sensitivity analysis could test the application of alternative forecasting or valuation approaches.

Important relationships between cost and benefit drivers should be considered. It may be appropriate for the sensitivity analysis to **include scenarios where multiple key parameters are varied in the same direction (that is, worst-case and best-case analysis)**.

This type of sensitivity analysis is most informative when central NPV results are positive (for worst-case analysis) and negative (for best-case analysis), respectively. Note, the probability of realising these extreme results may decrease as more parameters are varied.

**Undertaking only a standardised sensitivity analysis on total costs and benefits** (e.g., plus 20 per cent and minus 20 per cent to total costs or benefits) **is generally not recommended**. However, this it may be helpful in the early, less detailed stages of CBA.

### Expected Net Present Value (ENPV) through simple risk weightings

Calculating Expected Net Present Value (ENPV) through simple risk weightings is a simple and practical approach to incorporating risk into CBA. It may be suitable when it is difficult to differentiate between two initiatives or options with similar central NPV estimates.

Estimating ENPV requires **defining a set of discrete potential events and assigning a probability of each event occurring**. The ENPV of the initiative is then calculated by multiplying the NPV for the initiative under each event by the estimated probability of the event occurring and then summing the result.

The estimated probability of each event occurring can be determined based on historical data, some related experience, expert opinion, or other sources of information. The source for probability estimates should be clearly documented in the CBA report.

### Considering risk in Expected Net Present Value (ENPV)

CBA assumes risk neutrality.<sup>50</sup> However, the probabilities used to determine ENPV can provide additional information to decision makers by revealing the uncertainty of cost and benefit streams.

For example, Table A4.2 presents Project A, which has a 70 per cent probability of producing an NPV of \$1.0 million and a 30 per cent probability of producing an NPV of \$2.0 million. The ENPV of Project A is therefore \$1.3 million. Project B has a 50 per cent probability of producing an NPV of \$1.25 million and a 50 per cent probability of producing an NPV of \$1.35 million. The ENPV of Project B is therefore also \$1.3 million.

Table A4.2<sup>8</sup>. Illustration of simple risk weighting

Policy options	(1) NPV Result (Event 1) (\$m)	(2) Probability of Event 1	(3) PV Result (Event 2) (\$m)	(4) Probability of Event 2	Risk weighted ENPV = (1)x(2) + (3)x(4)
Project A	1.00	0.7	2.00	0.3	1.3
Project B	1.25	0.5	1.35	0.5	1.3

Table A4.2 shows that Project A and B have the same ENPV, but Project A is relatively riskier because it has a wider range of possible outcomes.<sup>51</sup> There is a high chance of Project A returning an

<sup>50</sup> Risk neutrality is where a person is indifferent between a certain outcome, and a gamble with the same expected value.

<sup>51</sup> More generally the degree of risk is reflected in statistical measures such as the standard deviation and confidence interval.

NPV of \$1 million, which is lower than any outcome of Project B. This demonstrates the importance of presenting information on the probability distribution used to determine the ENPV.

For CBA of smaller initiatives, ENPV based on a simple risk weighting of a few expected outcomes (e.g., worst-case and best-case, along with the central estimate), usually based on experience, may suffice. For more complex CBA, consideration of the probability distribution function used to calculate the ENPV for each option may contain important information for decision makers.

### **Monte Carlo Analysis – creating probabilistic cost-benefit analysis**

Monte Carlo analysis is a computerised simulation based on repeated random sampling from relevant probability distributions (assigned based on historical data or judgement) to produce multiple simulations. These simulations are used to derive a combined frequency distribution of certain outcomes occurring. The number of simulations required to generate a well-defined distribution depends on the particular circumstances.

Simple parameter testing and testing worst-case and best-case scenarios has limitations. For example, these techniques do not account for the probability of each outcome for a parameter occurring. Monte Carlo Analysis is becoming more common in CBA to estimate the expected value of an initiative with greater precision.

Key parameters in a CBA may each have their own probability distribution. Monte Carlo Analysis can be used to combine multiple probability distributions to produce a probabilistic overall CBA result.

**Monte Carlo simulations facilitate the analysis of risks from a combination of varying assumptions and probability distributions.** In principle, any number of risks or causes of uncertainty relating to an initiative could be included. This could include scenarios where these risks may occur individually, sequentially, or simultaneously. Examples of salient risks that have been incorporated in costs and benefits using Monte Carlo analysis in a high-cost or complex proposal includes:

- site risks (e.g., contamination and remediation)
- design, construction, and commissioning risk
- financial risk
- operating risk
- tax and other legislative changes
- market risk and general economic conditions
- network and interface risk
- regulatory risk
- force majeure
- breach, default and/or termination risk
- rainfall scenarios.

As another example, the frequency and severity of floods or wildfires in a model may underpredict what is observed due to omission of empirical evidence held by First Nations people and communities or omission of climate risks. To address such ‘unknown knowns’ (see Table A4.1), proponents can work to identify all risks that may impact an initiative and test the initiative’s exposure to these risks, ideally through Monte Carlo Analysis.

Monte Carlo Analysis can generate probability distributions for the NPV and BCR. These can then be used to determine an expected (average) NPV and BCR and the probability that the NPV will be positive or that the BCR will exceed a certain value. This allows for the application of confidence

intervals. For example, if the lower bound of a 90 per cent confidence interval for the BCR is equal to 1.0, then we can be confident the BCR will be above 1.0, 95 per cent of the time.

Monte Carlo Analysis only provides a realistic distribution of outcomes if the assumptions and data underpinning the analysis are accurate and realistic and the appropriate distribution is modelled.

Probabilistic modelling approaches should be informed by research, learnings from similar projects and experts' opinion on appropriate values of input variables. Experts can include project managers, service delivery officers, legal or other experts who are able to identify the relevant probabilities.

Box A4.1 describes the use of Monte Carlo Analysis in CBA of water supply initiatives.

#### **Box A4.1: The role of Monte Carlo Analysis in understanding the impacts of water supply initiatives**

One of the most significant challenges in CBA of initiatives for managing water supply is the significant uncertainty about future rainfall and what this means for an initiative's benefits profile.

For example, once a drought begins, there is uncertainty over how long it will last. Investing in additional water supply, say by building a desalination plant, may produce very high benefits if the drought is ongoing when the plant is finished, but relatively little benefit if the drought ends before the plant is operational.

A Monte Carlo Analysis could incorporate the uncertainty about future rain into the CBA by randomly generating thousands of different possible rainfall scenarios over a 100-year period.

The results of the Monte Carlo Analysis can then be used to produce a probabilistic CBA, based on the benefits of the initiative under each rainfall scenario.

Box A4.2 provides useful resources on Monte Carlo simulation.

#### **Box A4.2: Resources on Monte Carlo Analysis**

- [European Commission, Guide to Cost-Benefit Analysis of Investment Projects \(2014\)](#). See Annex III pp 337-342 for an introduction to Monte Carlo simulations including case studies.
- Boardman et al, *Cost-Benefit Analysis: Concepts and Practice*, 5th Ed., Appendix 11A.
- [ATAP, Risk and uncertainty assessment \(2021\)](#). Provides a detailed explanation of undertaking probabilistic CBA, with examples.
- [Australian Government, Department of Infrastructure and Regional Development's supplementary guidance Probabilistic Contingency Estimation](#). Provides in-depth discussion and a worked example related to an infrastructure project.

### **Scenario planning**

Scenario planning sets up a few plausible scenarios to test key technical, economic, political, or other uncertainties that could affect the success of an initiative. Scenarios usually consist of future states that differ in crucial respects, usually significant or 'big picture' factors. Each scenario must be internally consistent and independent of the other scenarios.

Scenario planning is best undertaken in conjunction with (or considering the assumptions tested in) parameter sensitivity analysis. **Sensitivity analysis on parameters occurs in the most likely state of the world, whereas scenario planning explores different states of the world.**

Scenarios are not forecasts; they describe ‘what if’ situations that might occur over the medium to long-term. For example (*illustrative only*), possible disruptions on account of different climate change scenarios, population growth scenarios, or travel behaviours (e.g., historical travel patterns or post-COVID travel patterns). Since they are not intended to be forecasts, scenario construction should avoid averaging scenarios or attempting to assign probabilities to scenarios or choose the most likely scenario.

In some cases, scenario planning can help to illuminate inherent uncertainty facing decision makers and support flexibility in planning to avoid locking in irreversible decisions prematurely.

Scenario planning is also a preparatory step when undertaking Real Options Analysis.

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## A4.4 Real Options Analysis

Real Options Analysis (ROA) is a valuable technique for ensuring that the scope and timing of an initiative provides the best chance of limiting its exposure to downside risk while increasing its exposure to upside risk by creating ‘optionality’ within an initiative, as well as improving design.

Real Options (ROs) provide the flexibility, but not the obligation, to undertake certain actions in the future, or to alter a project pathway when risks and uncertainty become clearer. ROs create the option to make the initiative more suitable to future states of the world.

For example, if an initiative is exposed to cost escalation through increased input costs, proponents can manage this risk by creating the RO to substitute into less-expensive substitute inputs (where possible) or delay the project until the risk of cost escalation has subsided.

ROA recognises the potential benefits of flexibility and optionality in investment strategies, allowing initiatives to be updated, changed, or even abandoned as new information becomes available.

ROs can be defined in advance and include clear trigger points that determine when the opportunity to execute the real option arises. Table A4.3 contains several examples of ROs.

ROA aims to **estimate the dollar value of keeping options open which might otherwise be closed off based on initial NPV assessment for the most likely outcome**. In some cases, this means postponing investment decisions until trends in demand or cost risk become clearer.

In some cases, ROA may suggest, for example, choosing to forego some economies of scale by constructing a smaller project with the option of expanding it under certain growth outcomes. Box A4.4 provides an example in decision-tree form.

It is recommended that ROA is considered for:

- Long-lived infrastructure initiatives. For example, a real option for a road initiative could be to set aside additional land adjoining the road. If required in the future, the additional space can be used to widen the road as demand increases.
- Initiatives where there is a high degree of uncertainty over future payoffs from the investment. For example, water supply projects where there is variability in future rainfall or climate adaptation projects, where there is a large degree of uncertainty around climate forecasts.
- Initiatives where there is the ability or opportunity to delay the timing of the investment, at least partially.
- Initiatives where more information about potential rewards or payoffs (though never complete certainty) becomes available over time.



Table A4.39. Type of Real Options

Type	Examples
Timing options	Delaying an initiative or staging parts of the investment until there is more certainty around key assumptions. This may also include an option that allows investment to be deferred without giving up the right to invest in the project.
Staging options	Undertaking an initiative in stages as new information becomes more certain (such as demand forecasts or population growth). For example, building the foundations now that allow the ability to expand or reduce capacity in the future.
Switching options	Switching inputs or outputs to suit changes in demand and supply. In cases where prices or demand changes, the initiative has the flexibility to change the mix of inputs used to produce the same output.
Abandon options	An option to abandon allows proponents to exit the project during delivery for a pre-determined price on the basis that the poor results of the prototype indicate likely project failure.
Design option	Designing an initiative in a way that increases flexibility to respond to future service needs.

### Incorporating Real Option Analysis into Cost-Benefit Analysis

Real option valuation techniques utilise statistical approaches to value real options and incorporate the results into a CBA. This approach may require costly technical expertise.

For practical purposes, real option *valuation* is likely to only benefit initiatives that are large scale, potentially irreversible, costly to revise during implementation and affected by significant uncertainty.

However, strategic real option *thinking* can be valuable for any project (see Box A4.3).

#### Box A4.3: Strategic real option thinking

Explicitly understanding and addressing uncertainties in the decision-making process and initiative lifecycle is the key principle of real options analysis. That is, under uncertain conditions, what is the best way forward that will maximise welfare now and into the future given the possibility of deferring some aspects of a project?

In this way, real option thinking should be considered in all projects, including unquantifiable uncertainty, when developing a range of options to address a problem or opportunity.

Decision tree analysis is a useful technique to consider possible decision points and quantify the value of any associated feasible ROs in CBA.

Decision tree analysis assists in analysing sequential risks compounding over time. Practitioners should know, with reasonable evidence, the key uncertainties or risks that result in a different 'future states', and estimate the probabilities of those future states occurring, and corresponding different options and pay-offs under various future states. Probabilities can be either subjective or objective depending on data availability.

This information can be visually mapped in a decision tree. See Box A4.4 for an example. The expected NPV for each branch of the decision tree can be calculated. The initial pathway that offers the choice of options that maximises the expected NPV is preferred.

Further, the actual project pathway followed may end up being different to the least cost pathway that would have been chosen in the absence of uncertainty.

Table A4.4 provides a list of resources on how to apply or review ROA.

Table A4.4: Resources on Real Options Analysis

Resource	Description and links
<a href="#"><u>Infrastructure Australia Assessment Framework 2021 Guide to risk and uncertainty analysis</u></a>	A technical supplement to Infrastructure Australia's Assessment Framework.
<a href="#"><u>Department of Treasury and Finance (Victoria): Investing under uncertainty. Real options analysis technical supplement – Investment Lifecycle and High Value High Risk Guidelines</u></a>	A technical supplement to Victoria's Department of Treasury and Finance (DTF), business case guidelines.
<a href="#"><u>Australian Transport Assessment and Planning (ATAP) Guidelines, T8 Real Options Assessment</u></a>	This guide provides a high-level overview of real options assessment and illustrates its use in transport assessment.

#### **Box A4.4: Example of decision tree analysis for real options in a water supply infrastructure initiative**

A proposal for investing in additional water supply capacity, such as dams, water towers, and desalination plants is being considered. There are two options to consider in one part of the water network:

- Option 1: invest in the construction of a standard dam now, or
- Option 2: invest in the groundworks and foundations for a dam which can be upgraded quickly in the future.

The decision to invest is required immediately to align to other projects in a network of broader infrastructure. There is an equal probability of high or low climate change impacts in the future.

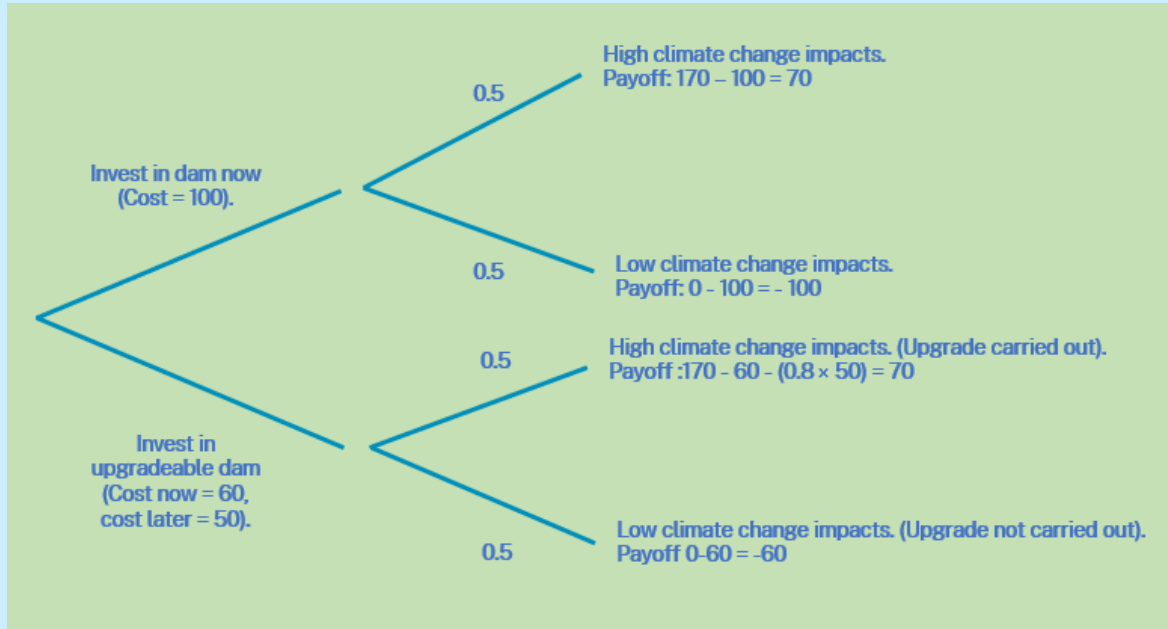
The standard dam costs 100 and has benefits of 170 from avoided flooding if high climate change impacts occur (zero otherwise).

The groundworks for the upgradeable dam cost 60, the future upgrade costs 50, and the benefit is also 170 if high climate change impacts occur. The upgrade can be put off until there is more certainty about the impacts of climate change.

This information is set out in a decision tree:



**Box A4.4 continued: Example of decision tree analysis for real options in a water supply infrastructure initiative**



Simplifying assumptions: residual damages under the ‘do not invest’ strategies have been ignored; the discount factor for the future decision to upgrade or not is 0.8.

The expected NPV of investing in the standard dam is  $(0.5 \times 70) + (0.5 \times -100) = -15$ . This suggests the investment should not proceed.

Flexibility over the investment decision in Option 2 allows the possibility to upgrade in the future if the impacts of climate change are observed to be high. The expected value of this option can be calculated.

If the impacts of climate change turn out to be high enough to warrant upgrading, then the NPV of the investment is 70. If low climate change impacts eventuate, no upgrade is carried out, but the earlier groundworks are sunk costs, totalling 60. However, these sunk costs are lower than in the case of the ‘standard’ dam and overall, the expected NPV of investing now with the option to upgrade in the future is  $(0.5 \times 70) + (0.5 \times -60) = +5$ .

Comparing the two approaches shows an NPV of -15 for the standard approach, and +5 for the Real Options approach. The Real Options approach also has a non-monetised benefit because it allows better views of the dammed river for longer. The value of flexibility to upgrade in the future is reflected in the higher expected NPV and switches the investment decision.

Source: Adapted from UK Treasury’s, *The Green Book Central Government Guidance on Appraisal and Evaluation, Version 3 (2022)*.

# Appendix 5: Social welfare and distributional analysis

This appendix outlines the basic theory of welfare economics and steps for undertaking distributional analysis that can inform equity considerations.

- Cost-benefit analysis estimates net social benefit, which is the difference between total benefits and total costs.
- In some cases, where the costs are borne by less well-off groups in society and the benefits accrue to better-off groups, an initiative with positive net social benefit may result in adverse equity outcomes.
- Distributional analysis disaggregates the overall impacts of the options by groups of beneficiaries. This transparency is valuable for decision makers to make informed decisions accounting for social equity as well as overall net social benefit.
- Illustrative examples of distributional analysis include the Kaldor-Hicks Tableau framework that provides an approach to identify the flow of benefits and costs between different sections of society.

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## A5.1 Social welfare

Social welfare depends on the accrual of benefits and costs to different groups in society resulting from economic activity. The key groups in welfare economics are:

- consumers
- producers (owners of land and capital)
- labour
- government<sup>52</sup>
- externalities
- environment.<sup>53</sup>

The sum of an initiative's benefits and costs on these groups is the **net social benefit**.<sup>54</sup> CBA estimates the net social benefit of an initiative by comparing the net benefit to all groups generated by the initiative relative to the base case (in present value terms).

It is useful for decision makers to understand the likely distributional impacts of proposed initiatives as in some cases the net social benefit of an initiative is positive, but some groups bear the costs. Decision makers may wish to structure the initiative to ensure that those that gain could compensate those that are made worse off.

**In theory, if this compensation occurred then some people would gain, and no one would be worse off.** In practice, negative impacts can often be ameliorated. It is therefore important for **decision-**

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<sup>52</sup> For example, see Richard J, Hueth D and Schmitz A (2008) *Applied welfare economics*, Edward Elgar Publishing.

<sup>53</sup> Note: in this edition of the Guide, we have added Externalities and separately the Environment as additional key groups. Although externalities, including traditionally environmental externalities, are impacts on third parties as a result of production or consumption usually in primary markets.

<sup>54</sup> Use of net social benefit is consistent with the first and second fundamental theorem of welfare economics. For a discussion of these theorems, See Abelson P (2018) 'Chapter 3: competitive markets: efficiency and welfare', *Economics: Principles and Practice*, On-Line edition.

makers to be advised on distribution of costs and benefits upon certain groups. Accordingly, CBAs are required to present an assessment of distributional impacts alongside cost-benefit results. In some cases, this analysis could identify options for compensation arrangements.

## A5.2 Distributional analysis

Distributional analysis disaggregates the overall impacts of each option in a CBA by stakeholder groups, identifying those that gain and those that suffer losses or how gains are distributed across groups.

**Distribution of gains and losses is an important aspect of any new initiative**, particularly in a reform context. The success of some reforms can hinge on having a robust understanding of the distributional impacts as well as appropriate strategies to manage the distribution of gains and losses. Distributional analysis is likely to differ for each initiative, given the wide range of policies that could be developed and assessed by CBA. Potential categories, subject to data availability, are outlined in Table A5.1.

Table A5.1: Distributional analysis by category type

Category	Examples
Geographic regions	ABS Statistical Areas, Local Government Areas, planning regions, districts, metropolitan and regional New South Wales.
User type	Existing and induced (new) users of a service.
Income	Income quantiles or other specified ranges.
Institutional sectors	Households, businesses and Government.
Demographics	Age, ethnicity, gender, occupation.

The time and resources spent producing the distributional analysis should be **proportional to the size, risk and distributional impact of the initiative**. Greater levels of disaggregation are likely to involve greater analytical effort. The main consideration for analysts is whether some level of stakeholder disaggregation should be attempted and provided, and the consequence of potential outcomes to members of the community.

Factors that may inform this judgement could include, availability of data, the likelihood of losses to an identifiable group(s) and quantum of these losses, and existence of government financial transfers between groups (especially if they exacerbate income inequality).

Based on consideration of these factors and their effect on identified groups, **qualitative distributional analysis informed by evidence may be sufficient. Quantitative distributional analysis should be considered where effects are expected to be material** for the identified groups.<sup>55</sup>

### Five main steps in a distributional analysis

1. Identify the key groups of interest in the relevant community for the initiative. For each key group, use project information or intended outcomes of policy design to determine appropriate sub-groups.

<sup>55</sup> HM Treasury (2022) The Green Book – Central Government Guidance on Appraisal and Evaluation.

2. Allocate all category of costs and benefits identified in the CBA to each specific group where they apply.<sup>56</sup> Consider whether any of these costs or benefits may shift to another group. For example:
  - a. savings in production costs may be passed on to consumers in lower prices (especially in a competitive market)
  - b. where producers retain surpluses, these may accrue to owners of capital or to other employees
  - c. user benefits (time savings) from transport infrastructure may (ultimately) be capitalised into land value uplift and accrue to landowners (rental returns)
  - d. these shifts may be informed by various exercises including detailed modelling, outcome attribution in the logic model, ex-post evaluation information, or expected allocation of funding across sub-groups.
3. Consider how financial transfers are borne between groups, for example:
  - a. taxes on producers may be passed on in higher prices, and taxes on consumers may lead to lower prices received by producers
  - b. subsidies for producers may lead to lower prices for consumers
  - c. add back in any transfer payments that have been netted out of the CBA (i.e., costs to one group that are experienced as equal-sized benefits by another group, such as public transport fares or taxes). Payers and payees could be informed by the Financial Analysis.
4. Consider any unquantified effects and whether these are likely to impact significantly on any of the identified groups.
5. If appropriate, consider any mechanisms that could mitigate inequitable social impacts arising from the policy.

Distributional analysis provides supplementary information alongside the NPV and BCR in a CBA. **Completing a distributional analysis may require additional information beyond that required for a standard CBA**, for example:

- Demand curves for each group would be required to estimate group-specific consumer surplus.
- Forecasts of prices are needed for the long-term distribution of taxes or subsidies between producers and consumers.
- Understanding the groups that would bear the funding costs of an initiative.
- Accounting for transfer payments, mainly indirect taxes and subsidies.

**This Guide does not recommend the use of distributional weights.** That is, increasing or decreasing the value of costs or benefits depending on what group they accrue to. Distributional weights involve a high degree of discretion over equity judgements that are better placed in the hands of decision-makers.

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## A5.3 Example templates of distributional analysis

Distributional analysis disaggregates the overall impacts of each option by stakeholder groups, identifying beneficiaries and those made worse off. Consider the hypothetical CBA results in the first table below and another example of possible distributional analysis.

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<sup>56</sup> Note, this may depend on the pricing policy identified in the CBA, for example the use of road tolls.

Table A5.2: CBA distributional analysis by cost and benefit category (illustrative example)

CBA results (present value at prevailing discount rate)	Option 1	Option 2	Option 3
<b>Incremental costs (\$m)</b>	<b>\$6.0</b>	<b>\$24.0</b>	<b>\$42.0</b>
Cost category 1 (e.g., Capital costs)	\$1.0	\$7.0	\$13.0
Cost category 2 (e.g., Operating costs)	\$2.0	\$8.0	\$14.0
Cost category 3 (e.g., Maintenance costs)	\$3.0	\$9.0	\$15.0
<b>Incremental benefits (\$m)</b>	<b>\$15.0</b>	<b>\$33.0</b>	<b>\$51.0</b>
Benefit category 1 (e.g., WTP to fish)	\$4.0	\$10.0	\$16.0
Benefit category 2 (e.g., Producer surplus)	\$5.0	\$11.0	\$17.0
Benefit category 3 (e.g., WTP to avoid water bird loss from contamination)	\$6.0	\$12.0	\$18.0
<b>Net Present Value (\$m)</b>	<b>\$9.0</b>	<b>\$9.0</b>	<b>\$9.0</b>
<b>BCR</b>	<b>2.5</b>	<b>1.4</b>	<b>1.2</b>

Table A5.3: CBA distributional analysis by stakeholder (illustrative example)

CBA results (present value at prevailing discount rate)	Option 1	Option 2	Option 3
<b>Incremental costs (\$m)</b>	<b>\$6.0</b>	<b>\$24.0</b>	<b>\$42.0</b>
Government	\$6.0	\$24.0	\$42.0
<b>Incremental benefits (\$m)</b>	<b>\$15.0</b>	<b>\$33.0</b>	<b>\$51.0</b>
Consumers (i.e., use of lake)	\$4.0	\$10.0	\$16.0
Producers (i.e., businesses)	\$5.0	\$11.0	\$17.0
Broader community (e.g., environment gain)	\$6.0	\$12.0	\$18.0
<b>Net Present Value (\$m)</b>	<b>\$9.0</b>	<b>\$9.0</b>	<b>\$9.0</b>
<b>BCR</b>	<b>Not required.</b>		

## Kaldor-Hicks Tableau (for costs and benefits)

The Kaldor-Hicks Tableau framework is a helpful tool to consider distributional impacts in CBA, policy evaluation, and wider policy analysis.<sup>57,58</sup> Analysts could consider undertaking this analysis for short-listed options in the CBA.

Each row presents each cost, benefit, and transfer category with its associated final net impact. Each column presents impacts by each stakeholder identified. The final net impact column presents the usual CBA results, and the overall value-for-money and efficiency can therefore be analysed in two ways, by the sum of the:

- net impacts of each cost and benefit, or
- net distributional impacts on all stakeholders.

In the example<sup>59</sup> below, the CBA results (cost and benefit categories and present values) are presented in the far left and right columns, respectively.

- Key sub-groups likely impacted from the initiative are listed in the top row.
- CBA results, apportioned to respective sub-groups, are located in the centre of the table.
- Transfer payments are presented transparently across sub-groups and net to zero.

**First**, the key groups likely impacted from the initiative are listed in the top row. Sub-groups may be identified from initiative information and intended outcomes of the policy design.

**Second**, the CBA results are apportioned to respective sub-groups (where applicable) in the centre of the table. This apportionment may be informed by various exercises including detailed bespoke modelling, outcome attribution in the Logic Map, ex-post evaluation information, or expected distributions of Government funding across sub-groups.

**Third**, transfer payments, with payers and payees informed by the Financial Analysis, are included. The sum of these should net to zero.

Summing each column yields the distributional effects by key sub-groups. It should be noted that the NPV in the distributional analysis will be the same as the CBA, but the BCR will differ. **Presenting the BCR in Distributional Analysis is not required.** In the example below, the city and residents are the main beneficiaries of the Government-funded initiative.

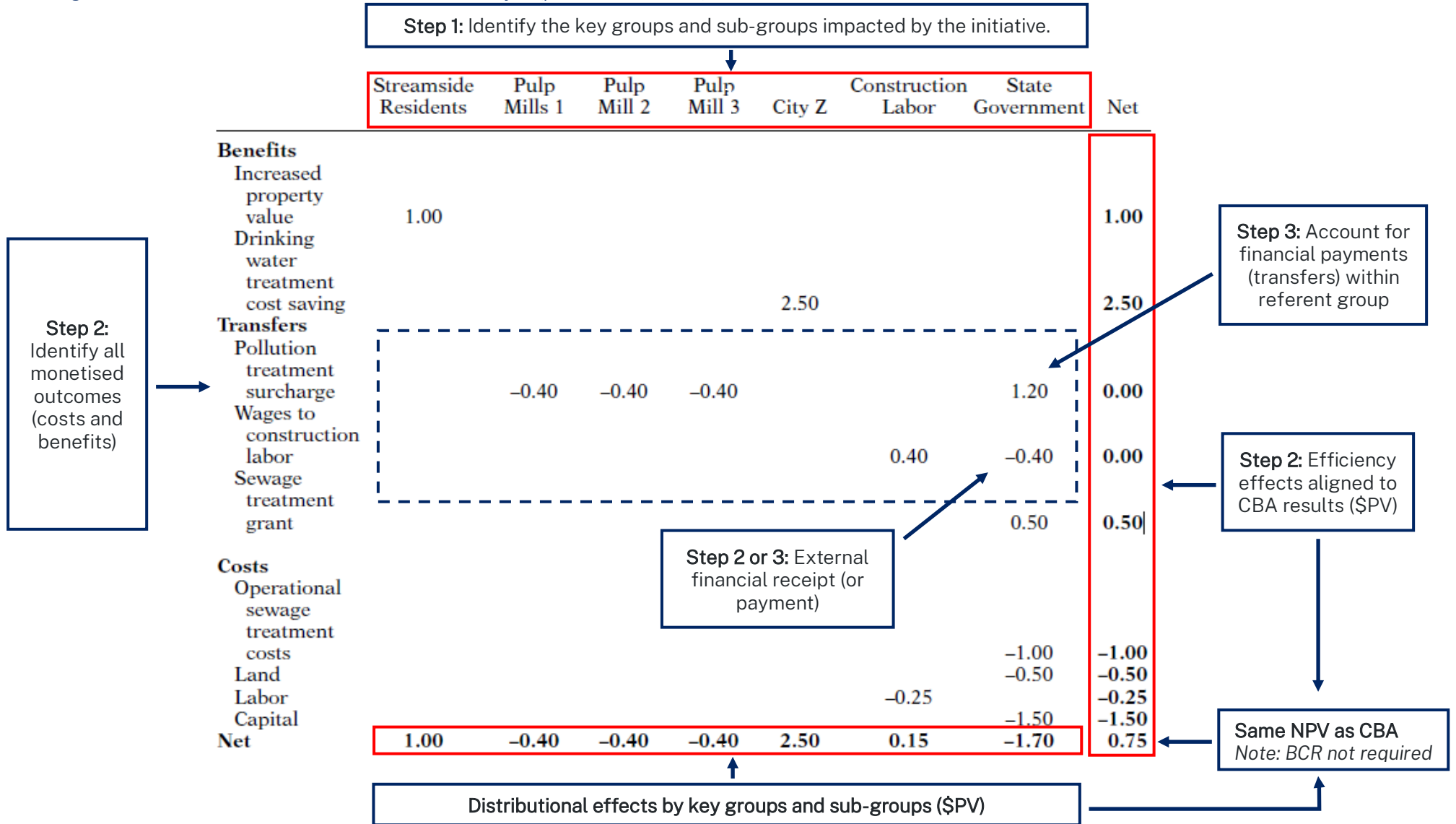
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57 Krutilla K (2005) 'Using the Kaldor-Hicks tableau format for cost-benefit analysis and policy evaluation', *Journal of Policy Analysis and Management*, 24(4):864-875.

58 For a detailed example, please see the Krutilla (2005) reference above.

59 Ibid.

Figure A5.1: Kaldor-Hicks Tableau for distributional analysis (present value in \$M)





# Appendix 6: Discount rates in CBA

This appendix outlines the theory and practice of discounting. The mandated social discount rate is 5 per cent per annum (in real terms). Sensitivity testing should be undertaken at 3 per cent and 7 per cent per annum (in real terms).

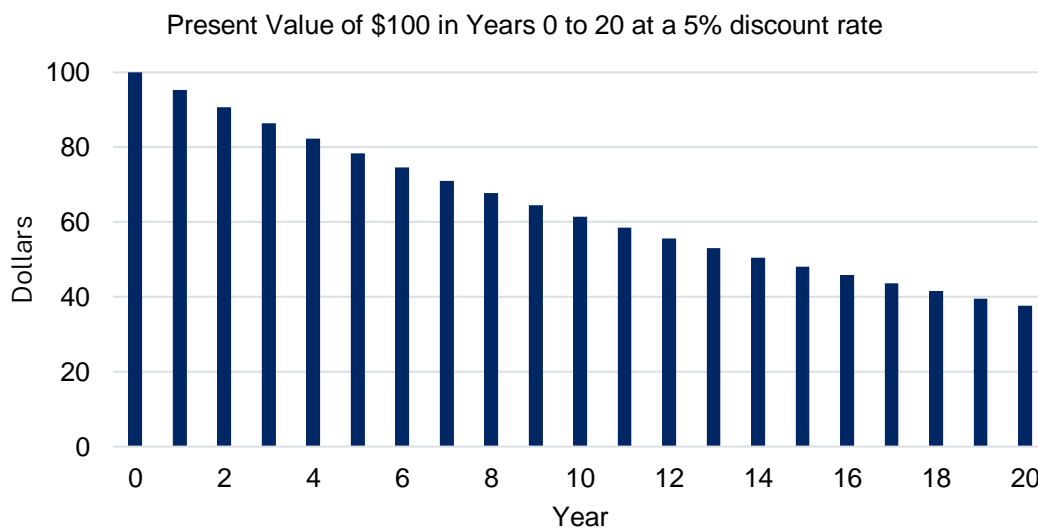
## A6.1 The concept of discounting

Costs and benefits flowing from an initiative are generally spread over time. For example, a social policy may have initial implementation costs and then benefits and operating costs extending into the future.

**To compare costs and benefits occurring over different time periods, it is necessary to discount the value of future costs and benefits to determine their present value.** Present value is today's value of some future stream of costs or benefits. Present values allow for decisions to be made in the present about initiatives that have costs and benefits in the future. It also allows for comparisons over time or across proposals with different analysis periods.

Discounting reflects the view that a dollar received in the future is worth less than a dollar now (for a consumer) or that a dollar invested today will not be available to invest elsewhere (for an investor). The arithmetic of discounting is represented graphically in Figure A6.1, showing the present value in Year 0 (today) of \$100 received in each future year.

Figure A6.1: Stylised example of discounting under a 5 per cent per annum discount rate



Note, this form of discounting does not reflect inflation. **The social discount rate is a real rate of discount that applies to cost and benefit streams estimated in constant dollar terms (i.e., real terms).**

## A6.2 The theoretical basis for the social discount rate

**Social discount rates (SDR) aim to reflect the opportunity cost of resources to society in the long term.** SDR are used in economic appraisal and evaluation to recognise that resources allocated to one initiative have other potential foregone uses. This is consistent with a decision-making environment of limited resources and competing uses.

The Guide uses opportunity cost of capital as the theoretical basis for determining the SDR. This approach recognises that capital is limited, and that any given public investment occurs at the expense of some alternative public, or private, investment. In this context, the 'return' on the public



investment should be compared to the hypothetical return achievable by the next-best private sector investment (the marginal opportunity cost of capital).

The most prominent alternative theoretical basis for discounting is social rate of time preference. This approach recognises that society values current consumption over future consumption. In a growing economy, society tends to value a dollar of marginal consumption today at a higher rate than a dollar of marginal consumption in the future (when incomes are assumed to be higher).

This Guide applies opportunity cost of capital approach because regardless of how public capital was originally raised, there is nearly always an investment opportunity cost. Additionally, using the opportunity cost of capital aligns closely with the efficiency criterion in CBA. Moreover, the opportunity cost of capital approach aligns New South Wales with other Australian states and territories and the Commonwealth.

The social rate of time preference approach is also theoretically sound and future iterations of the Guide will continue to consider the merits of both approaches, in consultation with other Australian treasury and finance departments.

### **The SDR set in the Guide applies to all initiatives**

**It is important to have a consistent social discount rate for all initiatives in all sectors.** A different rate would imply one project or sector has a higher opportunity cost than another. If estimated stream of costs and benefits differ between initiatives, this should be reflected in the expected values of the cost and benefit flows, rather than the discount rate. Box A6.1 provides an illustrative example.

**A consistent social discount rate also enables comparisons between initiatives** on a ‘like with like’ basis. A single rate allows for consistent interpretation and comparison of CBA and evaluations across the full range of NSW Government initiatives. This helps to minimise confusion about CBA for different projects of different agencies, as initiative funding requests may be carried over to future years (where the discount rate is the same across periods).

#### **Box A6.1: Applying a consistent discount rate**

CBA does not attempt to weigh a benefit (or cost) differently once it has been estimated. To do so would be contrary to the basic valuation principles employed in CBA.

For example, take a health outcome and an environmental outcome both with benefit(s) valued at \$10,000 now and approximately \$6,500 in 10 years' time (assuming a 5 per cent a year discount rate). In a CBA these benefits would be treated as equivalent values, subject only to discounting.

Therefore, the same discount rate must apply to the health benefit and the environmental benefit. Moreover, the same discount rate should apply regardless of whether the health benefit or the environmental benefit is generated by a transport project, a health project or an environmental project. Once benefits have been estimated, the sector of the project does not in any way change the investment opportunity lost from public sector expenditure.

## Risk adjustments and the social discount rate

It is important that the SDR reflects systematic risk. Systematic risk refers to unavoidable (non-diversifiable) market risk that affects all initiatives and cannot be reduced by further diversifying a portfolio of initiatives.

Adjusting the SDR to reflect project specific risk (also called non-systematic or diversifiable risk) could distort outcomes by altering the present value of costs and benefits as a function of time, not as a function of risk. In practice, all calculations in a CBA are subject to many sources of risk. **If one project has a higher degree of risk than another this should be reflected in the quantification of the expected values of costs and benefits, not through adjustments to the SDR.**

## The social discount rate is consistent over the analysis period

For simplicity, the SDR should be stable over the analysis period.<sup>60</sup> The SDR in this Guide is estimated on the basis that it is a long-term opportunity cost of capital and its application over the analysis period reflects this and there is no clear way to predict future trends to the opportunity cost of capital in the long-term.

Initiatives that have very long-term impacts (e.g., hundreds of years in the future) that may involve intergenerational equity considerations tend to be the main rationale for declining discount rates.<sup>61</sup> This does not closely align with the efficiency criterion of CBA or the opportunity cost of capital theory where the wellbeing of future generations is best served by investing and reinvesting in the highest available return.

Further, as much of the discounting has already occurred by year 100, the impact on the results is unlikely to be meaningful to include this type of complexity. Appendix 6 outlines how to present distributional effects, which are a separate consideration. As discussed in Appendix 4.2, **sensitivity analysis is the most practical approach to test the effect of alternative discount rates.**

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## A6.3 Empirical benchmarks to calibrate social discount rates

There are **two main empirical benchmarks that can be used to calibrate the long-term social discount rate** based on the real pre-tax opportunity cost of capital:

1. **Forward looking benchmarks** derived from the Capital Asset Pricing Model or Weighted Average Cost of Capital.
2. **Backward looking benchmarks** derived from the Australian National Accounts.

Applying either approach there is evidence to suggest that discount rates have fallen over time.

Recent Treasury analysis indicates that the pre-tax real long-term opportunity cost of capital is approximately 5 per cent a year. This estimate is within the range of estimates found elsewhere, discussed next, but more importantly it is reflective of the longer-term decline in the opportunity cost of capital.

The Independent Pricing and Regulatory Authority (IPART) uses current market data and long-term averages to estimate the Weighted Average Cost of Capital (WACC) for a 'benchmark' regulated

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<sup>60</sup> This assumption does not apply for an ex-post CBA, should the discount rate change during the evaluation period.

<sup>61</sup> Weitzman ML (1998) 'Why the far-distant future should be discounted at its lowest possible rate', *Journal of Environmental Economics and Management*, 36:201-208, proposed that when there is uncertainty about the discount rate, the discount rate mathematically is similar to a deterministic discount rate that declines over time. This does not mean the discount rate declines over time just that a stochastic discount rate that accounts for uncertainty requires a declining discount rate. Weisbach D, Sunstein CR (2009) 'Climate change and discounting the future: a guide for the perplexed', *27 Yale Law and Policy Review* 433, conclude that projects, including climate change, should be evaluated by discounting at the market rate of return, properly adjusted for uncertainty and the inherent value of the environment.

business. IPART publishes both a short term (40-day) and long term (10 year) measure of the WACC based on a standard gearing ratio (60 per cent) and average market volatility (equity beta of 1). The most recent pre-tax real long term WACC (August 2022) is 4.5 per cent,<sup>62</sup> compared to 7.2 per cent in (February) 2017, which shows considering the forward-looking approach, the social discount rate has decline over time.

More than a decade ago the Australian Productivity Commission published a paper authored by visiting researcher Harrison (2010) that reported a real pre-tax rate of return on capital in Australia of 8.9 per cent.<sup>63</sup> This figure is based on Dolman (2007) and is derived from Australian National Accounts data.<sup>64</sup> The research paper considers this estimate to be 'consistent with other national accounts based estimates of the before-tax rate of return to investment in Australia and the United States and with estimates of the cost of capital in Australia'. More recently, Fernandez (2019), applying a similar approach, reported a real pre-tax rate of return of 6.8 per cent.<sup>65</sup> Similar to the results of the forward-looking benchmark, these analyses show that when considering the backwards-looking approach, the social discount rate has declined over time.

Therefore, based on the two main empirical benchmarks and analyses of each over time, it is evident the long-term social discount rate has declined.

It is important to note that the nominal benchmark Government long term bond rate is not a relevant empirical benchmark for calibrating the opportunity cost of capital because the government's ability to borrow at a lower rate than private parties derive from its powers to raise compulsory taxes from the community (which impose welfare losses on the economy).

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## A6.4 The recommended social discount rate

Based on the considerations above, **economic appraisals and evaluations must use a 5 per cent a year real central estimate social discount rate. Sensitivity testing is to be undertaken using a lower bound of 3 per cent and an upper bound of 7 per cent per annum (real).**

The social discount rate is a parameter and has been calibrated based on long-term empirical benchmarks of the opportunity cost of capital. It is, however, appropriate to periodically review this parameter. **Treasury will consider undertaking a review** earlier should economic circumstances change sufficiently.

While this Guide uses the opportunity cost of capital as the theoretical basis for the social discount rate, it is acknowledged that there are competing theories, and this can lead to different discount rates. For example, while dated, Harrison (2010) canvasses estimates in recent decades ranging from 1 per cent to 15 per cent depending on the approach taken – 1 per cent to 5 per cent for time preference rates, and 5 per cent to 15 per cent for opportunity cost of capital rates.<sup>66</sup>

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62 See <https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Regulatory-policy/WACC> for further information about IPART's WACC methodology. At the time of writing, the pre-tax long term WACC estimate can be found in the spreadsheet model accompanying IPART's WACC Biannual Updates.

63 Harrison M (2010) *Valuing the future: the social discount rate in cost-benefit analysis*, Productivity Commission.

64 Dolman B (2007) 'The distribution of recent economic gains: some early observations' [presentation] *Productivity Perspectives Conference*, Canberra.

65 Fernandez R (2019) 'Review of discount rates used in economic evaluations', *Victoria's Economic Bulletin*, 24-32.

66 Harrison M (2010) *Valuing the future: the social discount rate in cost-benefit analysis, productivity commission* Chapter 3, canvasses various discount rate concepts and benchmarks, and distinguishes between descriptive and prescriptive approaches to setting the social discount rate. The prescriptive approach mixes efficiency and equity considerations and provides a wide range of suggested discount rates that reflect different value judgements which cannot be resolved objectively.

As such, sensitivity analysis is important when using a social discount rate in an economic appraisal and evaluation. The sensitivity tests of 3 per cent, and 7 per cent, represent a meaningful range and should be used to test whether the outcome of the appraisal or evaluation changes significantly with the discount rate.

# Appendix 7: CBA Results and decision criteria

This section describes the key results in CBA, as well as the key decision criteria to apply when interpreting these results.

## A7.1 Results and decision criteria

This section explains how the Net Present Value (NPV) and Benefit-Cost Ratio (BCR) are calculated and how each should be used to inform decision-making in different circumstances. While this section focuses on quantitative results, it is important to present these results in the context of the entire analysis. This should include an outline of:

- inputs and assumptions used in quantification
- results of sensitivity analysis
- distributional analysis
- qualitative costs and benefits (Section 2.8 provides further information on reporting results).

The key results of a CBA are the:

- **Net Present Value (NPV)**, and
- **Benefit Cost Ratio (BCR)**

Note, the method for calculating BCR has been updated from the previous Guide (TPP17-03).

**NPV and BCR both indicate whether an option's benefits exceed its costs in present value terms for a given discount rate** (NPV above zero; BCR above one). Options where costs exceed benefits in present value terms (NPV below zero; BCR below one) indicate that overall social welfare is reduced.

Note, the NPV and BCR:

- Show results for benefits and costs that have been quantified, therefore, it may be possible that unquantified (or unquantifiable) impacts could affect the results in either direction.
- Central estimate may change with different assumptions for parameters used, usually shown through sensitivity analysis.

### Net Present Value (NPV)

The NPV of an option is the sum of the present value of benefits that have been valued, less the sum of the present value of costs that have been valued (shown in Formula 7.1) in absolute terms — i.e., in dollar amounts.

An NPV above zero indicates that benefits outweigh costs and measures the net social benefit (or welfare gain) to society from undertaking an initiative compared to the base case. A NPV below zero represents a net social cost (or welfare loss) to society.

#### Formula 7.1 – Net Present Value (NPV)

$$NPV = \sum_{t=0}^T \frac{B_t - C_t}{(1+r)^t}$$

Where:  $B_t$  = Project benefits in year t expressed in real terms (i.e., excluding inflation)

$C_t$  = Project costs in year t expressed in real terms (i.e., excluding inflation)

r = Real social discount rate

T = Number of years in the analysis period

### Benefit Cost Ratio (BCR)

The BCR of an option is the ratio of the sum of the present value of benefits to the sum of the present value of costs (shown in Formula 7.2). A BCR greater than one indicates that benefits outweigh costs.

#### Formula 7.2 – Benefit Cost Ratio

$$BCR = \frac{\sum_{t=0}^T \frac{B_t}{(1+r)^t}}{\sum_{t=0}^T \frac{C_t}{(1+r)^t}}$$

Where:  $B_t$  = Project benefits less disbenefits (if any) in year t expressed in real terms (i.e., excluding inflation)

$C_t$  = Project costs in year t expressed in real terms (i.e., excluding inflation)

r = Real social discount rate

T = Number of years in the analysis period

In Formula 7.2:

- Project (resource) costs incurred by NSW entities (primarily, but not exclusively, NSW Government) to deliver the initiative (i.e., capital **and** operating costs) **should be included in  $C_t$ , that is, in the denominator.**
- **Negative externalities (sometimes referred to as disbenefits) should be included in  $B_t$  that is, the numerator.** Negative externalities are indirect costs resulting from the initiative that are borne by third parties. They are not in  $C_t$  because they are not drawn from a constrained pool of funds.
- **Cost savings** are identified as a benefit in this Guide and should be included in  $B_t$ , that is in the numerator. For example, recurrent cost savings may occur where operating and maintenance costs are lower under the initiative than in the base case. It may also be necessary to offset the avoided benefits associated with avoided costs, where applicable.

Box A7.1 expands on Formula 7.2 to show where benefit and cost categories should be placed to ensure consistent reporting of the BCR.

### Initiatives with no project resource costs

Some initiatives, such as regulatory proposals, may have zero (or very close to zero) project resource costs. In these cases, a BCR is not calculable under Formula 7.2. Because initiatives with no project resource costs do not draw funding from a constrained pool of funds, this Guide suggests that calculating a BCR for such initiatives is usually not essential.

If a BCR needs to be calculated for an initiative with zero project resource costs, for presentational or policy reasons, then agencies should calculate an alternate BCR referred to here as a '**welfare ratio**'. The welfare ratio is calculated using the same method as the BCR (Formula 7.2) **except** disbenefits are included in the denominator ( $C_t$  in Formula 7.2) instead of in the numerator ( $B_t$  in Formula 7.2).

## Initiatives with a negative BCR

In rare cases, it will be possible for CBA of an initiative to return a negative BCR ( $BCR < 0$ ) using Formula 7.2. This is not possible under alternate BCR formulas where only positive terms can be included in the numerator. A negative BCR:

- can occur if, and only if, disbenefits (i.e., negative externalities) are larger in absolute value than benefits for an initiative
- indicates the initiative will do ‘more harm than good’ in terms of its outcomes, meaning it will reduce social welfare regardless of its project resource costs.

Negative BCRs should not be used to rank initiatives by BCR. Generally, an initiative with a negative BCR can immediately be ranked below any initiative with a positive BCR and should not be pursued. If it is absolutely necessary to rank initiatives with negative BCR against each other, they should be ranked by NPV (indicating which initiative does the least amount of harm).

### Box A7.1: Benefit-Cost Ratio (BCR) Formula

To promote consistency in presentation of the BCR, this Box links the Benefit and Cost categories identified in Chapter 2 (Tables 2.4 and 2.5) to Formula 7.2. It identifies which categories go into the numerator and the denominator.

$$\frac{B_t = B_1 + B_2 + B_3 + B_4 + B_5 + (B_6 - C_5) + B_7}{C_t = C_1 + C_2 + C_4}$$

Where:

$B_1$  = Savings or avoided costs

$B_2$  = Government revenue

$B_3$  = Consumer surplus

$B_4$  = Producer surplus

$B_5$  = Labour surplus

$B_6$  = Benefits to the broader community (i.e., positive externalities)

$C_5$  = Costs to the broader community (i.e., negative externalities)

$B_7$  = Residual value

$C_1$  = Capital costs

$C_2$  = Recurrent costs

$C_4$  = Ancillary costs (e.g., transaction costs)

Note:

$C_3$ , regulatory costs, are mostly relevant for Regulatory Impact Statements. In this instance, these costs would go into the denominator ( $C_t$ ).

### How to use each result to inform various decisions

If NPV and BCR produce the same ranking of options within a CBA, then either can be used to rank those options, and both should be reported.

Table A7.1 provides context on how to use NPV and BCR.



Table A7.1: How to use the NPV and BCR

Criteria	Context
NPV	<p>NPV can be used:</p> <ul style="list-style-type: none"> <li>to make an ‘accept or reject’ decision for an individual initiative</li> <li>to compare mutually exclusive options (i.e., a set of options of which only one can be implemented) <ul style="list-style-type: none"> <li>Mutually exclusive options can include alternative implementation timing(s) or alternative project design for the same initiative.</li> </ul> </li> <li>to compare alternative combinations of related initiatives where implementation of one initiative affects the benefits and/or costs of another (i.e., where the initiatives are not independent).</li> </ul>
BCR	<p>BCR can be used:</p> <ul style="list-style-type: none"> <li>to rank initiatives to maximise net benefits to society from a portfolio of independent initiatives when there is a budget constraint.<sup>67</sup> <ul style="list-style-type: none"> <li>The budget constraint refers to decision makers’ funding constraint.</li> </ul> </li> <li>to make an ‘accept or reject’ decision for an individual initiative.</li> </ul>

Note:

- Classification of costs and benefits does not affect NPV results but can impact BCR results.
- BCR results calculated according to Formula 7.2 cannot be compared with other specifications of the BCR to rank options.
- BCR should not be used to rank mutually exclusive projects.
- In certain niche cases, such as ranking a mix of independent and mutually exclusive initiatives, linear programming techniques may be required to rank proposals, but this is uncommon and not discussed in this Guide.

Note, if decision makers are seeking to rank projects strictly within a fixed pool of NSW Government funds, another metric known as ‘NPV/I’ can be useful. NPV/I is the ratio of NPV of an initiative (NPV as defined in Formula 7.1) to the amount of Government investment required to implement the initiative (i.e., capital, operating and ancillary costs incurred by the NSW Government only).

<sup>67</sup> A budget constraint can be defined in reference to an individual agency, a cluster, the whole of government, or NSW community depending on the pool of proposals that are being selected or ranked. In this Guide it mainly, but not always, refers to whole of government.



# Appendix 8: Other analytical and modelling approaches

This appendix discusses other techniques for assessing or informing projects and programs seeking government funding:

- Preliminary Cost-Benefit Analysis
- Cost-Effectiveness Analysis (CEA) or Cost-Utility Analysis (CUA)
- Multi-Criteria Analysis
- Economic impact assessment (input-output analysis, and computable general equilibrium (CGE) modelling).

The advantages and limitations of these techniques should be considered in deciding whether they provide helpful information for decision makers. These techniques, by themselves, do not assess net social benefit of proposals, but they may be useful complements or supplements for CBA. They do not, however, substitute for a CBA, except in certain cases where CEA (or CUA) may substitute for CBA (these need to be determined with Treasury on a case-by-case basis).

## A8.1 Preliminary Cost-Benefit Analysis

CBA may suffer from limitations in data or analytical resources that could make it difficult to undertake a fully developed analysis. However, the process of undertaking some form of CBA still provides a transparent and logical process to set out the potential impacts of an initiative. A preliminary CBA, a less detailed form of CBA with principles still based on welfare economics, can be a useful tool to apply in certain circumstances. Various jurisdictional and other guidance discuss such analysis under different titles (e.g., rapid CBA) with some variations on necessary requirements, but effectively cover the same process. See Table A8.1 for a summary of other guidance commenting on short-form CBAs.

Table A8.1: Example of short-form CBAs in guidance and literature

Source	Examples
Infrastructure Australia (IA), <i>Guide to economic appraisal</i> , Rapid CBA	Applies standard CBA principles and techniques but focuses on quantifying the most material economic costs and benefits.  It is less intensive and most suitable as an early indicator of a proposal's impact.  IA's approach more closely aligns with their Strategic Business Case process and is 'rapid' compared to a fully detailed CBA required to select the 'preferred' option.
New Zealand Treasury, <i>Guide to Social Cost Benefit Analysis</i>	Rough CBA – The roughest CBA – Qualitative CBA ( <i>not recommended</i> ) Rough CBA – The next level up – CBA with rough quantification ( <i>recommended</i> )
Boardman et al, <i>Cost-Benefit Analysis: Concepts</i>	Qualitative CBA – this approach requires analysts to quantify as many of the impacts as possible, and include qualitative estimates for the rest, making use of estimates from other CBA analyses or research.

Source	Examples
<i>and Practice</i> , 5 <sup>th</sup> edition	

The **New Zealand Treasury ‘the next level up’** and **IA’s rapid CBA** approach are consistent with our view of what a preliminary CBA should cover.

Examples for where a preliminary CBA might be useful include:

- Initiatives that are below the threshold requirements for a Business Case (i.e., below \$10M), but some analysis would be useful to understand the potential for a net benefit to exist.
- General (small-scale) grant programs (applying standardised valuations). This analysis could be assisted through the development of a spreadsheet model that automates a CBA-type process, with standard parameters, following the inclusion of relevant data from proponents.
- Proposals for program funding envelopes without clear projects yet available for assessment (conditional on the scale of funding being considered).

Agencies should discuss with Treasury before proceeding to agree on its suitability for use.

## A8.2 Cost-Effectiveness Analysis

Cost effectiveness analysis (CEA) shows the costs of achieving a given outcome. The aim is to achieve the outcome(s) at the lowest cost. **CEA is used to compare the costs of different options where outcomes are taken as given or considered equivalent among options.**

CEA was previously applied in cases where CBA was not possible, mainly due to difficulties in valuing the major benefits in dollar terms. In recent decades, however, methods have been developed to value benefits which could not previously be quantified, usually in the human services sectors, e.g., health, education, and disability services. Although, where benefit streams for one benefit category differs between two options, then we consider there may be sufficient grounds to proceed with a CBA. **Therefore, CBA is the preferred appraisal approach.**

CEA may be considered if some of the following factors are observed:

- it is not possible to value the major benefits in monetary terms
- benefit valuation and data collection are likely to be expensive relative to the cost of the initiative
- it is early in the options development process and differences between option benefits cannot yet be discerned.

CEA is most applicable when all the options have the same or similar degree of effectiveness, **but target the same outcomes**, because the aim simplifies to minimising cost for the given outcome. In many cases, however, carrying out a CEA is not that simple because:

- different options have different degrees of effectiveness, or
- the ‘business as usual’ option represents a lower level of services.

The steps in conducting a CEA are similar to those for a CBA, except benefits are typically not quantified in a CEA. CEA requires similar evidence as CBA, but CEA only shows the least cost option.

In some cases, it may be possible to assume a linear relationship between effort (expenditure) and effectiveness (outcomes). For example, if it can be established that one option is twice as effective as another, it may be possible to compare the costs of the options more easily.

In other cases, the equivalent effectiveness could be inferred – for example, through the application of a uniform set of physical standards. This approach should be taken with great care because uniform standards can potentially impose inefficient costs (e.g., some buildings may not all require identical physical attributes or features to deliver similar performance outcomes).

In instances where the above alternatives are not feasible, the appraisal should describe the effectiveness of each option as fully as possible. Where assumptions are made about the degree of effectiveness versus cost, the agency should document assumptions made and supporting evidence. These assumptions could be based on post-implementation reviews of past programs, or precedents in other Australian jurisdictions or elsewhere, and may be subject to appropriate qualifications (e.g., differences in statutory or regulatory regimes among jurisdictions).

The major disadvantages of CEA are:

- it cannot be used to compare initiatives with different outcomes or objectives that are not directly comparable
- unlike CBA, CEA cannot indicate whether the preferred option provides a net benefit to society
- it is possible that the **preferred option in a CEA could result in a net cost rather than a net benefit to society.**

For these reasons, **where CEA is used initially, agencies should aim to collect better information from post evaluations over time to enable a transition to CBA** when changes in policy, analytical techniques or data availability make CBA feasible.

A variation of CEA, referred to as **cost-utility analysis (CUA)**, estimates costs in monetary terms and benefits expressed as either Quality-Adjusted Life Years (QALY) or Disability-Adjusted Life Years (DALY). QALYs are changes in welfare (utility) associated with an improvement in the length of life or quality of life. CUA is often used in health-related initiatives.<sup>68,69</sup>

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## A8.3 Multi-Criteria Analysis (MCA)

Multi-criteria analysis (MCA) entails identifying criteria, assigning weights to them, and then scoring options on how well they perform against each weighted criterion. The sum of the weighted scores is used to rank each option against others. A simpler variant could entail listing the performance criteria to be considered and assessing each option, program, or project on whether or not it meets those criteria.<sup>70</sup>

**A CBA with valuations is preferred over MCA.** At an early stage some understanding of cost and the primary outcome should be known, hence CEA may also be preferred to MCA or at least complementary. **MCA may be useful** where it is not possible or practical to value all costs or

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68 CUA estimates the ratio between the cost of an intervention and the benefit that the intervention generates, where the latter is measured by QALYs – a QALY value of 1.0 applies to each year lived in perfect health, or 0.0 if dead. If not lived in full health, a QALY would be valued between 0 and 1. One DALY represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost (YLLs) to due to premature mortality and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population.

69 Another approach typically applied for health interventions includes Cost-Consequence Analysis (CCA), which is a systematic description and measurement of a set of intervention attributes that should be considered when making a decision. CCA does not prescribe a decision rule and provides the building blocks for more detailed analytical methods such as CUA and CBA.

70 UK Treasury (2011) *Green Book: Appraisal and Evaluation in Central Government*, p 35.

benefits in monetary terms in an efficient and timely manner before undertaking a CBA or CEA to assess the long-listed options.<sup>71</sup>

**MCA has some advantages relative to informal and undocumented judgment but does not substitute for CBA or CEA.**<sup>72</sup> MCA can provide a degree of structure to the early-stage assessment process. It can be open, explicit, relatively simple, require less detailed information than CBA or CEA and permit the assessment process to be documented for future reference.<sup>73</sup>

The main limitations of MCA compared to CBA are:

- Preconceptions or biases within decision makers, analysts, or stakeholders consulted, may not be readily detected or amenable to review or replication and they may apply their own personal objectives, criteria, and weights, which may not accord with the preferences of society as a whole.
- Putting numbers on what are essentially qualitative assessments can give a false impression of scientific certainty, since the number produced by one MCA cannot be replicated or compared with the number produced by another and is not objectively testable.
- MCA is not founded on any principles of welfare measurement and therefore cannot show whether a program or option adds to, or subtracts from, social welfare. Unlike CBA, MCA does not require that benefits exceed costs nor identify when the base case might be preferable.
- MCA is not denominated in monetary terms and cannot compare projects and options from a net social welfare perspective.
- In practice MCA can inadvertently include contradictory criteria, or double count complementary criteria making it difficult to interpret the results of the analysis for fiscal decision-making purposes.

Use of CBA instead of MCA in areas such as environmental and social policy does not mean the criteria considered are only those that can be valued in dollars. The quantified CBA result is one input into the decision-making process, and it is considered alongside qualitative benefits and other factors (see the 'Five Cases' in the NSW Government Business Case Guidelines).

The Guide suggests that at the '**very long list**' stage of assessing potential options, MCA may be a cost-efficient method to inform analysis. If undertaken, the criteria and weightings in the MCA should be aligned to a future CBA.

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## A8.4 Economic Impact Analysis

Economic impact analysis is not an alternative analytical approach, it mainly shows how economic activity (e.g., GDP, private consumption, investment, exports, employment and industry outputs) changes due to a specific initiative, such as a project or policy change, typically called 'shocks'. Estimates of GDP changes from economic impact models and net benefits from a CBA **are not interchangeable, nor additive**. Economic impact analysis, however, **can provide complementary information** to decision makers or, depending on the methodology, inputs into a CBA.

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71 Note; the long-list of options in this CBA Guide appears analogous to the 'filtered list' described in Infrastructure Australia's Guide to multi-criteria analysis.

72 UK Department for Communities and Local Government (2009) *Multi-Criteria Analysis: A Manual*, London, 19-21. See also Dobes L and Bennett J (2009) 'Multi-criteria analysis: "Good Enough" for government work?', *Agenda: A Journal of Policy Analysis and Reform*, Accessed at <https://openresearch-repository.anu.edu.au/handle/10440/1065>.

73 For guidance on how to undertake MCA well, see: <https://www.infrastructureaustralia.gov.au/guide-multi-criteria-analysis>.

## Input-Output (Multiplier) Analysis

Input-Output (I-O) Multiplier Analysis is commonly used to assess the impacts of a given initiative, often in reference to States or specific regions. Simply put, multipliers are applied to measures of direct expenditure to give estimates of direct and indirect flow-on impacts. Commonly assessed impacts include output, employment, and income. I-O analysis and multipliers are related but not equivalent concepts. Multiplier analysis is subject to significant limitations,<sup>74</sup> and **should not be used to measure social welfare in appraisal of initiatives.**

Input-Output Analysis, however, may be useful to analysts or consultants *to identify* first-round direct and indirect producers and suppliers when considering changes to producer surplus and related market impacts, as discussed in Section 2.3.

## Computable General Equilibrium (CGE) Modelling

A general equilibrium approach to assessing economic impacts applies a whole-of-economy lens to modelling the economy. CGE models (also called multimarket models) are an example of this approach, with analytical capabilities ranging from a regional, national, to an international level. A typical model comprises many equations, representing the behaviours and relationships between industries and institutional sectors of the economy.

This modelling approach aims to estimate the effect, and new equilibrium, of a change in one variable on all other related variables. **CGE models focus on the effects of exogenous demand and supply changes ('shocks') on economic activity, income, or employment.** These models address the main limitations of I-O analysis by allowing for input supply constraints and variable prices.<sup>75</sup> They indicate how an economy may react to changes in policy, technology, or other exogenous factors instead of expenditure alone.

CGE modelling is best used for assessing the macroeconomic impacts of a portfolio of initiatives of significant size, a large body of reforms, tax and trade policy, climate change, and price changes. **CGE models are of limited use for microeconomic initiative appraisal, selection and ranking based on social welfare.** Macroeconomic parameters in CGE models may not always be directly applicable to initiatives that do not have economy-wide effects on prices. CGE modelling might be considered for very large initiatives with significant geographical and distributional impacts.

**CGE complements and may inform but does not substitute for a good quality CBA.** It may, however, be used to model inputs that can be used in CBA, some considerations include:<sup>76</sup>

- **Scope** – A CBA generally includes social, environmental and any other non-monetary impacts, which generally need to be considered outside of the CGE model.
- **Treatment of costs** – CGE modelling should treat costs consistently with CBA by classifying construction expenditure as a cost, reflecting opportunity cost.
- **Welfare indicators** – CGE models typically present key economic indicators including GDP, consumption, and income which differ from welfare. Demand and production functions in the model equations may need to be used to estimate economic surplus and social welfare akin to CBA. Where CGE results present **measures of social welfare consistent with CBA they should be fully documented, and heuristics developed to allow for results to be checked.**
- **Model closure** – a CGE model has many equations, each explaining a model determined variable. As there are more variables than equations, some variables need to be treated as exogenous

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74 5209.0.55.001 - Australian National Accounts: Input-Output Tables - Electronic Publication, Final release 2006-07 tables: <https://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/5209.0.55.001Main%20Features4Final%20release%202006-07%20tables>.

75 *ibid.*

76 Queensland Productivity Commission (2018) 'Whole-of-economy modelling: beyond the black box', Staff Research Paper, 11-12.

(modeller determined). A 'closure' specifies which variables are determined exogenously and endogenously and **should be fully documented**.

**CGE models can also be used to evaluate distributional effects of an initiative or reform on the economy and at different levels of disaggregation** – e.g., impacts on consumers and businesses at the state or national level. Care should be taken when modelling highly disaggregated groups (e.g., regional level) due to the limited quality data.

CGE models provide a more complete picture of the impact on the economy than I-O analysis, but analysts' procuring this type of modelling or decision makers' considering results should be aware of the following considerations:<sup>77</sup>

- CGE modelling relies on the skill and decision of the modeller (e.g., input assumptions to various sectors of the economy) and may not provide an objective lens to evaluate and compare competing proposals on a 'like-with-like' basis.
- All government initiatives have some economic impact on the economy, this does not mean that social welfare has improved. For example, although increased employment and income are important factors, they are unlikely the main objective of a hospital, rail line or national park. A CBA is better to measure the change in social welfare directly from users benefitting from these services.
- Depending on the model's structure, CGE modelling may not necessarily account for the opportunity cost associated with investment in particular initiatives.

As CGE models typically rely on historical aggregated data and are based on relatively inflexible conditions, they may not always provide a realistic projection of the future for *individual* initiatives.

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<sup>77</sup> For common examples of CGE modelling issues, see *Ibid*, p 14.

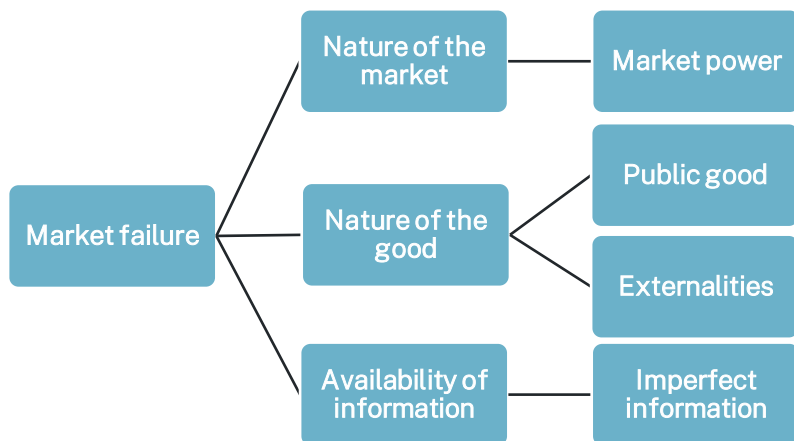


# Appendix 9: Types of market failure

Market failure refers to a situation where the private market fails to supply a socially optimal level of a good or service. Considering the role of market failures is a valuable step in establishing an initiative’s problem definition and rationale for government action.

There are four main types of market failure, depicted in Figure A9.1. Refer to the [NSW Department of Industry \(PUB17/509\) Market failure guide – A guide to categorising market failures for government policy development and evaluation](#) for detailed guidance on market failure.

Figure A9.1: Market failure categories



## Unintended consequences

In some cases, government interventions that aim to correct market failures can fall short of achieving a socially efficient allocation of resources. Previous government interventions may have produced ineffective, inefficient, or inequitable outcomes due to unintended consequences.

Similar to market failure, where failures of government interventions exist, there is a potential role for government to intervene to improve outcomes. These circumstances should be considered as a case for change and rationale for government action

# Appendix 10: Supplementary Guidance

This appendix references supplementary resources which may be useful when undertaking CBA. These are not alternatives to The Guide. **Where applicable, these frameworks should be used in conjunction with The Guide.** Analysts are encouraged to engage with the owners of these documents when they are used to inform CBA.

Supplementary guidance may be useful when assessing initiatives that:

- are too small to justify the cost of bespoke research such as WTP surveys
- relate to a sector with a defined assessment framework (e.g., education infrastructure)
- involve common cost/benefit streams (e.g., travel time savings).

**Guidance targeted at a specific sector can still be used to inform CBAs in different sectors.** For example, congestion cost parameters from a transport framework may be useful when assessing infrastructure projects which generate more congestion.

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## A10.1 Sector-specific frameworks

Specialised frameworks have been designed to assist analysts assessing proposals in certain sectors. Specific guidance which can inform CBA includes:

- Infrastructure Australia (July 2021), [Guide to economic appraisal](#)
- NSW Department of Customer Service (Draft 2023), [Addendum: Cost-Benefit Analysis – ICT and Digital](#) (*please contact for guidelines*)
- NSW Department of Communities & Justice (June 2020), [A guide to Cost-Benefit Analysis for new policy proposals – Best practice cost-benefit analysis](#) (*please contact for guidelines*)
- NSW Department of Communities & Justice (January 2023), [A guide to measuring economic and social benefits for justice systems proposals](#) (*please contact for guidelines*)
- NSW Department of Planning & Environment (September 2020), [Guidelines for using cost-benefit analysis to assess coastal management options](#)
- NSW Department of Planning & Environment (December 2015), [Guidelines for the economic assessment of mining and coal seam gas proposals](#)
- NSW Department of Planning & Environment (March 2022), [Interim framework for valuing green infrastructure and public spaces](#)  
([https://www.dpie.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0005/502772/interim-framework-for-valuing-green-infrastructure-and-public-spaces-2022-03.pdf](https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0005/502772/interim-framework-for-valuing-green-infrastructure-and-public-spaces-2022-03.pdf))
- NSW Department of Planning & Environment (April 2022), [Options assessment process](#)
- NSW Department of Industry (March 2018), [Safe and secure water program – cost benefit analysis guiding principles](#)
- NSW Health (October 2018), [Guide to cost-benefit analysis of health capital projects](#)  
([https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/GL2018\\_021.pdf](https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/GL2018_021.pdf))
- NSW Treasury (March 2017), [Cost-benefit analysis framework for government advertising and information campaigns](#)
- Transport for NSW (2019 version 2.0), [Cost-Benefit Analysis Guide](#).



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## A10.2 Parameter resources

Treasury's outcome values database (OVD) is a repository of quality assured parameters suitable for use in CBA.

In addition to this, parameter sources available to analysts include INFFEWS (September 2020), [INFFEWS Value Tool](#).

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## A10.3 Modelling tools

Generic modelling tools provide a framework for calculating a BCR given forecast cost and benefit streams. These are generally simple to use but offer less flexibility than a made-to-measure model.

INFFEWS (March 2019), [INFFEWS Benefit Cost Analysis Tool](#).

# Glossary

Term	Definition
Additionality	A concept used to account for net increases in benefits, that is, an increase in benefits to the referent group with the initiative relative to the base case. Consideration of the base case is essential to determine true additionality.
Altruistic values	The value individuals place on someone else's use of a good or service, including use by future generations.
Analysis period	The period that defines the start and end date of a CBA.
Attribution	The extent to which a change is caused by, or attributable to, an initiative (relative to other external factors/causes).
Base case	In CBA, the base case is the projection of costs and benefits if none of the options proceed. It is a 'business as usual' situation, sometimes referred to as the 'counterfactual'.
Base year	The year to which all values are discounted when determining a present value.
Benefit	An increase in welfare associated with an initiative's outcomes (including economic, social, environmental or cultural outcomes). Benefits need to be first be understood as changes in condition, i.e., outcomes.  In CBA, benefits are a measure of the value of the outcomes of an initiative to the NSW community – they may be monetary or non-monetary (methods exist to monetise non-market benefits).
Benefit Realisation Management (BRM)	A process of identifying, organising, managing and measuring benefits so that intended benefits are achieved. It is a continuous process running through the whole life of the initiative.
Benefit-Cost Ratio (BCR)	The ratio of the present value of net benefits to the present value of resource costs.
Benefit transfer	A valuation method that draws valuations from existing studies to use as proxy values for benefits or costs of the current initiative.
Cost Benefit Analysis (CBA)	A holistic appraisal method that estimates the economic, social, environmental and cultural costs and benefits of an initiative and expresses them in monetary terms.
CBA <i>Ex ante</i>	CBA undertaken prior to the implementation of an initiative.
CBA <i>Ex post</i>	CBA evaluation undertaken when an initiative is either underway (referred to as interim or 'in media res' <i>ex post</i> CBA) or completed (final <i>ex post</i> CBA).

Term	Definition
Computable general equilibrium (CGE) models	Economic models that show how an economy as a whole may respond to changes in policy, technology or other exogenous factors.
Consumer surplus	The situation where a consumer receives a good or service at a lower price than the maximum they are willing to pay.
Cost Effectiveness Analysis (CEA)	A form of economic evaluation that compares the costs of different options to achieve a given outcome.
Costs	Costs include the direct and indirect costs (monetary and non-monetary) of implementing an initiative.
Cost-utility analysis	A form of economic evaluation that estimates costs in monetary terms and benefits in either Quality-Adjusted Life Years or Disability-Adjusted Life Years.
Defensive and corrective expenditure	Expenditure that mitigates the negative impact of an event before it occurs or reduces damages after it occurs.
Direct impacts	Impacts on producers and consumers of goods or services associated with an initiative.
Displacement	Displacement occurs when another activity is 'crowded out', relocated or partially reduced somewhere else in New South Wales, e.g., where a supported NSW business takes market share away from an unsupported NSW business.
Distributional analysis	Distributional analysis disaggregates the overall impacts of each option in a CBA to indicate which groups bear costs or receive benefits.
Equity goals	Goal(s) to reduce identified disparities between sub-groups within a population.
Evaluation	A systematic and transparent process that can be used to assess the appropriateness, efficiency, effectiveness or net social benefits of an initiative.
Evidence	Information or a body of facts, quantitative or qualitative, that can be used to assess the validity of a proposition or inform a decision. To be considered robust, evidence should be relevant to the context, credible, accurate and complete.
Expected values	Probability-weighted average of all possible outcomes associated with an initiative.
Externalities	Impacts on third parties because of production or consumption.

Term	Definition
Forecasting	Forecasting is the standard term used to describe projecting the future in CBA, making use of the best available data, evidence, techniques and assumptions.  Note, however, that CBAs often use projections based on technical assumptions as opposed to producing forecasts incorporating rational expectations.
Hedonic analysis	A revealed preference valuation method. Hedonic analysis conceptualises goods as 'bundles' of attributes and assumes that the price of the good is the sum of the value of these attributes. Regression analysis can then be used to determine the values of the attributes.
Higher value land use (HVLU)	The situation where an initiative changes the amount or type of floor space that can be delivered on a piece of land.
Indirect impacts	Impacts on third parties not directly involved in the consumption or production of the primary good or service.
Initiative	Any individual project, program, policy or regulation.
Inputs	The financial, human, material, technological and information resources used to implement and deliver the initiative.
Kaldor-Hicks Tableau	The Kaldor-Hicks Tableau framework is a tool to consider distributional impacts in CBA, policy evaluation, and wider policy analysis. Each row presents each cost, benefit, and transfer category with its associated final net impact. Each column presents impacts by each stakeholder identified.
Labour surplus	The situation where a worker's actual wages are greater than the minimum they are willing to accept to do the job (i.e., their reservation wage).
Land value uplift	The situation where land value is influenced by an initiative because it makes an area more accessible or attractive to live or work in.
Leakages	Leakage is the extent to which benefits generated in New South Wales 'leak out' of New South Wales. For example, consider a business operating in New South Wales but owned predominately by overseas shareholders.
Logic Model	A diagram that illustrates how an initiative is intended to work, by systematically setting out inputs, activities and outputs, and linking these with impacts (including outcomes and benefits). May also be described as a program logic.
Market failure	A situation where the private market fails to supply a socially optimal level of a good or service.
Marginal abatement cost	Marginal abatement cost modelling (i.e., a target consistent approach) is an approach to value carbon emissions. It estimates the marginal cost of reducing emissions along a trajectory necessary to reach a defined emissions reduction target in future.

Term	Definition
Meta-analysis	Meta-analysis draws on a pool of published studies to obtain estimates on mean impacts and variations.
Monte Carlo Analysis	Monte Carlo analysis is a computerised simulation based on repeated random sampling from relevant probability distributions (assigned either based on historical data or judgement) to produce multiple simulations. These simulations are used to derive a combined frequency distribution of certain outcomes occurring.
Multi-criteria analysis (MCA)	An option assessment technique. Multi-criteria analysis entails identifying criteria, assigning weights to them, and then scoring options on how well they perform against each weighted criterion. The sum of the weighted scores is used to rank each option against others.
Multiplier impact	The flow-on impacts from increases or decreases in income as they circulate through the economy. Sometimes referred to as second-round impacts. These are generally excluded from CBA.
Net Present Value (NPV)	The difference between the present value of benefits and present value of costs.
Net social benefit	The change in welfare that is derived from an initiative. This can be measured as the difference between total benefits and total costs attributable to the initiative (includes social, economic, environmental and cultural impacts).
Non-use values	The value individuals place on a good simply for its existence, independently of any use value.
Optimism bias	A cognitive bias that results in people systematically underestimating the likelihood of negative events occurring.
Opportunity cost	The value of alternative uses foregone by using a resource or taking an action in one way.
Option values	The value individuals place on the possible use of goods.
Outcome	Changes that are attributable to the initiative outputs. Changes may be in social, economic, environmental or cultural conditions and occur in the short, medium or long term. They may include changes in lives, status, health, surroundings, knowledge, attitudes, values, behaviours or satisfaction levels.
Output	The products, services and infrastructure that result from the initiative activities.
Peer review	A process where the quality of the work is evaluated by a reviewer, external to the business area and delivery team, with subject matter expertise.

Term	Definition
Preliminary CBA	A less detailed form of CBA with principles still based on welfare economics. Can be a useful tool to apply in certain circumstances.
Present value	Value today of some future cost or benefit.
Private use value	The value that individuals, households, communities or businesses gain from using something.
Producer surplus	A situation where the price that a producer receives for a good or service is greater than the cost of production.
Real options	Provide flexibility, but not the obligation, to undertake certain actions in the future, or to alter a project pathway when risks and uncertainty become clearer.
Reference class forecasting (RCF)	RCF uses actual data on outcomes from a group of past, similar initiatives (the reference class) to inform forecasting of the current initiative's outcomes.
Referent group	Households, businesses, governments, non-government organisations and natural assets in a specified community for which the impact of government decisions or actions are measured. In this Guide, the referent group is New South Wales.
Relevance	Concept to inform the assessment of evidence. Relevance is how closely connected or related the evidence is to the policy initiative.
Reservation wage	The lowest wage rate that a worker would be willing to accept for doing a particular job in a particular location.
Revealed preference	A non-market valuation method. Revealed preference (RP) methods estimate consumers' willingness to pay (WTP) by examining their actual behaviour.
Scenario Planning	A method for accounting for risk and uncertainty in CBA. Scenario planning sets up a few plausible scenarios to test key technical, economic, political, or other uncertainties that could affect the success of an initiative.
Shadow price	Values generated from non-market valuations.
Simple parameter testing	A method for accounting for risk and uncertainty in CBA. Involves varying parameters to show how CBA results vary with changes in assumptions.
Simulation models	A source of evidence for forecasting. Simulation models provide projections based on evidence collected and analysed over many years.
Social cost of carbon	Social cost of carbon (or damage costs) modelling is an approach to value carbon emissions. It quantifies the amount of damage caused by marginal additional emissions. The cost reflects the value of damage caused by

Term	Definition
	allowing an extra unit of emission. This cost can be calculated to estimate the damage caused globally, or the damage to a particular jurisdiction.
State Outcome	The primary purpose for which public resources are invested. NSW State Outcomes are declared in Budget papers.
Stated preference	A non-market valuation method. Stated preference (SP) methods ask individuals to self-report their preferences or valuations.
Strategic merit tests	An option assessment technique. Strategic merit tests check how well the identified options align with the economic, environmental and social goals of the initiative.
Sensitivity analysis	Shows how CBA results vary with changes in assumptions.
Social discount rate (SDR)	SDR are used in economic appraisal and evaluation to recognise that resources allocated to one initiative have other potential uses which are forgone. This reflects the fact that resources are scarce and there are many competing uses of resources.
Time series data	Time series data typically draws on aggregate or average data over time for a single variable.
Transfer payments	Financial transfers between groups within New South Wales that do not involve the use of economic resources.
Triangulation	Triangulation is a way of combining data or findings from multiple sources, that investigate the same subject, to build and check the accuracy of evidence.
Travel cost studies	A revealed preference non-market valuation method. Data collected on time, travel and accommodation costs is used to estimate the demand curve and consumer surplus for community facilities.
Validity	Concept to inform the assessment of evidence. Validity relates to causality, i.e., the appropriateness of the method used to assess the attribution of outcomes to the initiative.
Value for money	Value for money is achieved when the maximum benefit is obtained from the available resources.
Welfare	Welfare is synonymous with wellbeing of an individual, group, community or the entire society (in this case, the community of New South Wales). Changes in welfare may be related to social, economic, environmental and cultural outcomes.  In a CBA, social welfare refers to the aggregate change in benefits and costs across all NSW residents.
Wellbeing Valuation	Wellbeing valuation starts with an analysis of people's overall life satisfaction and then applies econometric methods to estimate the life satisfaction provided by specific non-market goods. It then converts these



Term	Definition
	into a monetary value using an estimate of the relationship between income levels and life satisfaction.
Wider Economic Impacts	Relate specifically to city-shaping projects where changes in urban density may change productivity.
Willingness to pay (WTP)	The maximum amount an individual or a firm is willing to pay for a good or service.
Willingness to accept (WTA)	The amount that individuals or firms are willing to accept in compensation for the loss of a good or service.

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