



The
Treasury

Cost-Benefit Analysis Framework for Government Advertising and Information Campaigns

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Preface

The purpose of this Framework Paper is to outline the application of Cost Benefit Analysis (CBA) to government advertising and information campaigns.

This Framework is capable of being applied to all forms of government advertising and information campaigns. The Framework Paper should be followed closely when conducting a CBA on government advertising campaigns greater than \$1m, as required by the *Government Advertising Act 2011*.

This Framework aims to provide guidance to agencies on specific issues in the CBA of government advertising campaigns, and is not intended to impose an excessive burden. Rather, the guidance in this document is intended to assist agencies to comply in a consistent manner with section 7(1) of the *Government Advertising Act 2011*, which requires a Cost Benefit Analysis to be carried out before a campaign commences. As such, the Framework should be applied by agencies in a manner that is suitable for each campaign.

The *NSW Government Guide to Cost-Benefit Analysis* (TPP17-03) governs the application of a CBA generally. This Framework Paper is consistent with TPP17-03 and should be read in conjunction with TPP17-03. In the first instance, TPP17-03 is the reference point for any technical queries on CBA.

For further assistance on matters covered in this Framework Paper, agencies can contact the NSW Treasury at contact@treasury.nsw.gov.au

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Summary: What Agencies should do to complete a Cost-Benefit Analysis

Section 7(1) of the *Government Advertising Act 2011* requires a Cost Benefit Analysis (CBA) to be carried out before the campaign commences:

7(1) The head of a Government agency must ensure that a cost benefit analysis of a Government advertising campaign of the agency is carried out before the campaign commences if the cost of that campaign is likely to exceed \$1,000,000 or such other amount as may be prescribed by the regulations.

In order to comply with this requirement, agencies should undertake the following steps:

1. **State the objectives of the campaign** – the primary aim of a government advertising campaign is to induce a behavioural change in members of the public which leads to benefits (increase in social welfare) for NSW residents.
2. **Establish the ‘base case’** – This defines the state of the world if the campaign was not undertaken. This is the scenario against which the CBA will compare outcomes if the campaign were to proceed as designed.
3. **Identify the all major economic, social and environmental costs and benefits.** A CBA evaluates the costs and benefits that result from an advertising or information campaign. Benefits could be based on physical volumes or other relevant units of measurement.
4. **Place a value on the costs and benefits** – focuses on collecting robust evidence to support the dollar values applied to physical units of measurement. Various methodologies are available to estimate these values.
5. **Assess net benefits** – when occurring over more than one year, benefits and costs should be discounted to present day values. The difference between these benefits and costs is the Net Present Value (NPV), and the ratio of benefits to costs is the benefit-cost ratio (BCR). The CBA should also assess based on rigorous evidence whether there are costs or benefits that cannot be quantified but which can be qualitatively described.
6. **Test for uncertainty** – using historical data to predict future outcomes, costs or benefits may be risky. As such, it may be necessary to provide a range rather than point estimates. Sensitivity testing should also be performed on the results to show a range of possible outcomes (e.g. worst case scenario).
7. **Conduct post-campaign evaluation** – after the campaign is completed, to assess campaign effectiveness and improve the evidence base for future campaigns.

Agencies should pay particular attention to gathering evidence for use in the CBA that demonstrates the following chain of impacts from the campaign to behaviour change to ultimate social welfare outcomes. Data in relation to this flow of impacts would inform steps 3 to 5 above, as well as the identification of risks and scenarios in step 6.

(A) **Advertising campaign** → (B) *Market reach (people who saw or heard the campaign)* → (C) *Individual awareness and recall of the campaign* → (D) *Individual motivation to change behaviour* → (E) *Actual behaviour change* → (F) *Dollar value of behaviour change* → (G) *Gross economic benefit* → (H) **Net economic benefit (gross benefits less costs)**

Agencies should also pay particular attention to gathering evidence that supports the 'base case' or the expected state of the world without the campaign, and the key assumptions that underpin that expectation.

Any assumptions should be based on relevant and robust evidence. This means that agencies should use evidence that targets outcomes comparable to their campaign, and ensure that it is based on a sound method and reliable data.

In estimating the impacts of the campaign from point A to point H above, agencies should demonstrate evidence of parameters regarding **effect size** (the estimated quantity change in behaviour as a result of the campaign); **attribution rate** (the predicted behavioural change that is attributable to the campaign only, and not to the impacts of other factors); and **decay profile** (declining impact of a campaign over time after it is completed).

In relation to establishing the attribution rate, agencies should provide evidence to show how factors external to the advertising campaign, such as State or Commonwealth government policies or social norms, influence behavioural change separately from the impact of the campaign.

Chapter 1: Introduction

This chapter introduces some basic context to the application of CBA to government advertising and highlights items requiring particular attention when applying CBA to government advertising. In conducting a CBA, agencies are encouraged to focus on the key issues identified in this chapter.

The remaining chapters of this Framework Paper outline:

- The costs to NSW residents associated with government advertising and ways to estimate these costs (Chapter 2);
- the benefits to NSW residents associated with government advertising and ways to estimate these benefits (Chapter 3);
- the overall evaluation of NSW Government advertising using CBA (Chapter 4); and
- a process for post-implementation review of government advertising in order to inform and support the future use of CBA (Chapter 5).

Appendix 1 provides a summary template for purposes of reporting headline CBA results to Cabinet.

A government advertising or information campaign is a public notification funded by (or on behalf of) a government agency to inform members of the public and to induce behavioural change in members of the public. This may be information about a government program, policy or initiative. It may also be information related to public health, public safety or other areas of public concern. Section 4(1) of the *Government Advertising Act 2011* defines a government advertising campaign as follows:

*4(1) In this Act, **Government advertising campaign** means the dissemination to members of the public of information about a government program, policy or initiative, or about any public health or safety or other matter, that:*

(a) is funded by or on behalf of a Government agency, and

(b) is disseminated under a commercial advertising distribution agreement by means of radio, television, the Internet, newspapers, billboards, cinemas or other media.

All NSW Government advertising campaigns have to comply with the *Government Advertising Act 2011*. Where the cost of a campaign is likely to exceed \$1m, Section 7(1) of the *Government Advertising Act 2011*¹ requires a CBA to be carried out before the campaign commences:

7(1) The head of a Government agency must ensure that a cost benefit analysis of a Government advertising campaign of the agency is carried out before the campaign commences if the cost of that campaign is likely to exceed \$1,000,000 or such other amount as may be prescribed by the regulations.

Government advertising campaigns can be broadcast through a variety of media channels such as television, radio, digital, print and direct mail. Government advertising campaigns can also be of varying frequency such as one-off campaigns, staged campaigns and repeat campaigns.

The primary aim of a government advertising campaign is to induce a positive behavioural change in the activities of members of the public. Ultimately, for campaigns funded by the NSW

¹ Government Advertising Act 2011, NSW, http://www.austlii.edu.au/au/legis/nsw/num_act/gaa2011n35288.pdf (accessed 18/11/14).

Government, the purpose of inducing this behavioural change is to enhance the overall welfare of NSW residents. In this sense, welfare refers to the general well-being of NSW residents considering a range of market and non-market factors such as economic, social and environmental factors.

Figure 1 describes the transmission mechanism through which an advertising campaign can improve welfare and emphasises the importance of achieving behavioural change to deliver economic benefits. It also highlights a range of other factors that are likely to influence individual decision making in combination or addition to government advertising. A thorough CBA should seek to assess and account for these issues in its analysis.

Government advertising does presume that members of the public are not already behaving in a manner that maximises their welfare. This is clearly the key point in justifying the role for government in advertising. Barriers that prevent the public from maximising their welfare are commonly referred to as market failures.

In order to justify government funded advertising, an agency should firstly identify and establish whether the campaign is necessary. Advertising campaigns are intended to provide information to the public in cases where free markets fail to provide sufficient information for individuals to make rational decisions about their own welfare and of others.

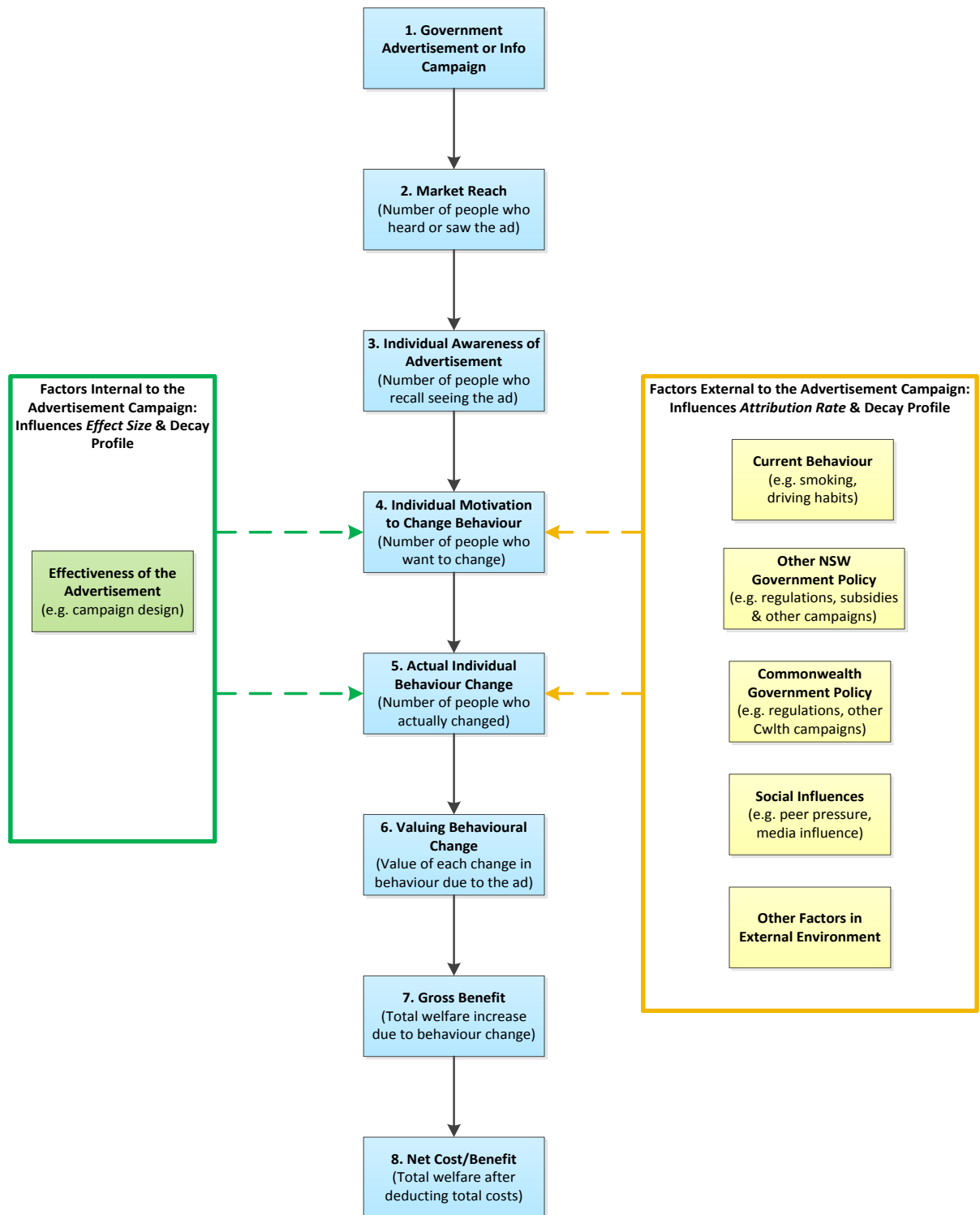
The need for a campaign might be demonstrated by valid and reliable evidence that:

- Information gaps exist – People behave in a certain way because they lack information about the impacts of their behaviour on their own or others' welfare. For example, reckless driving; or
- Information asymmetries exist – The information available to various parties is different leading to outcomes that are not optimal. For example, consumers of goods or services that are ultimately harmful to themselves may lack access to the same information about the consequences of consuming those goods or services as the parties who sell the goods to them (e.g., cigarette smoking); or
- Individuals have limits placed on their ability to make rational decisions that affect themselves or others, due to time constraints or other factors.

At the beginning of a CBA, an agency should demonstrate that any proposed information gaps are able to be effectively addressed by a government advertising campaign. The CBA should also consider how the campaign may complement other options as part of an overall policy package. For example, advertising options or other measures such as regulation could complement the advertising campaign.

CBA is a decision-making tool that assesses the impact of the advertising campaign on the welfare of society. It does this by determining whether the benefits of providing information outweigh the costs of the campaign. This requires an assessment of what would have happened in the absence of the campaign, referred to as the "base case". The base case is then compared with what is expected to happen with the advertising campaign.

Figure 1:
The Contribution of Government Advertising to Behavioural Change and Welfare



The output of a CBA is a Net Present Value (NPV) and a Benefit Cost Ratio (BCR). A NPV is the difference between the quantifiable costs and benefits of the advertising campaign, discounted to present day values using a discount rate². A BCR is the ratio of the present value of benefits to the present value of costs.

Where benefits are greater than costs (i.e. $NPV > 0$, $BCR > 1$), the advertising campaign is viewed as increasing overall welfare. Where costs are greater than benefits (i.e. $NPV < 0$, $BCR < 1$), the advertising campaign is viewed as reducing overall welfare. Consideration of qualitative costs and benefits can supplement the analysis.

In calculating the economic benefit of a government advertising campaign, agencies should provide evidence of the likely effectiveness of the campaign in inducing behavioural change. The latter must be directly attributable to the campaign, rather than to factors unrelated to it. The CBA should also address how the effect of the campaign decays over time.

The remainder of Chapter 1 discusses a number of issues specific to government advertising campaigns, particularly effect size, attribution rate and decay profile; the quality of the evidence necessary to inform these assumptions; and the need to identify a range of reasonable policy options to achieve an objective. The remaining sections of Chapter 1 should be read in conjunction with Chapter 5, which outlines possible approaches for undertaking post-implementation reviews to build the existing evidence base and to verify assumptions.

1.1 Effect size (behavioural change)

For an advertising campaign to generate benefits, it must successfully change the behaviour of the audience, or stop a potentially adverse change in behaviour. As such, a CBA will require a sensible evidence based measure that estimates the effectiveness of a campaign.

The estimated effect of a campaign on behavioural change can be referred to as the “effect size” of the advertising campaign. Campaign awareness is not a proxy measure for effect size. For a campaign to be effective it must encourage viewers to move from simple awareness to a change in behaviour.

Section 1.4 explains what an appropriate evidence base is and why it is necessary to support key assumptions. In circumstances where evidence is not available, Chapter 5 outlines possible approaches to undertaking post-implementation reviews to build the existing evidence base and to verify assumptions.

Isolating and evaluating the impact of advertising is not always simple. Adjustments often have to be made to deal with other factors such as time, policy changes and environmental considerations. The following two sections address these issues.

1.2 Attribution rate

Advertising is only one of many factors that can influence individual behaviour, which can also be induced by a change in policy, environmental or regulatory settings. The predicted effect size applied in the CBA must therefore account for these factors.

² The NSW Government Guide to Cost-Benefit Analysis (TPP17-03) specify the standard discount rates to be used for all CBAs. A real discount rate of 7% should be applied, with sensitivity testing at both 10% and 3%.

A well-designed evaluation, such as a randomised control trial, should be able to control for these other factors³. However, evidence from these forms of evaluation is often not available or primary surveys to collect the information are not feasible. As a result, the effect size estimates for campaigns often do not control for the effect of other factors.

Where this is the case, agencies will need to adjust the effect size to account for the impact of other factors. This will ensure that the effect size is not overstated, and represents the predicted behavioural change attributable to the advertising campaign only.

This is referred to as the “attribution rate”. Failure to calculate an appropriate attribution rate will likely result in overestimating the impact and benefits of the campaign. Attribution rates must be based on relevant and reliable evidence. Section 1.4 explains in greater detail the evidence base necessary to support key assumptions.

1.3 Decay profile

A CBA must consider the effect of an advertising campaign over time. A campaign is likely to have an effect in changing behaviour while it is being aired, but this effect is likely to reduce once the campaign is complete⁴. Plotting the declining impact of a campaign over time can be referred to as the “decay profile”.

The decay profile should establish how long the effects of an advertising campaign are likely to be felt. Agencies will generally need to calculate the decay profile on a case by case basis according to the specific characteristics of the campaign, and demonstrate that the decay profile is supported by relevant evidence. Given uncertainty associated with the decay profile, an agency should take a conservative approach unless there is strong evidence to suggest the campaign will have long-lasting effects.

For campaigns that occur in multiple stages, an agency should focus on whether the latter stages have the same or a reinforcing effect compared to the initial stage.

Section 1.4 describes in greater detail the evidence base necessary to support key assumptions. Agencies should take this into account when developing their decay profiles.

1.4 Evidence base

Agencies must ensure that the evidence underpinning any assumptions used in their analysis is relevant and reliable, to assure decision makers of the rigour of the CBA. Particular focus should be given to the evidence used to predict effect sizes, attribution rates, decay profiles and the dollar value of benefits. Costs are often relatively more predictable due to repeatability and budget controls.

³ Other methods such as multi-regression analysis may also be able to control for other factors. For example, this analysis may be able to control for any downward trends in road accidents when examining the effect of a road safety campaign.

⁴ There is a significant marketing literature on decay effects in relation to responses to advertising, which in turn has its roots in the field of cognitive psychology (including human attention, perception and memory) that dates back to the 1950s. More recent marketing literature dates back to the 1970s, mostly developed in the United States. See for instance F Bass, N Bruce, S Majumdar and BPS Murthi, “Wearout Effects of Different Advertising Themes”, *Marketing Science*, Vol.26, No.2, March-April 2007 for a useful summary of the literature on the concepts and measurement of decay (wear-out) effects.

Leigh (2009)⁵ proposes the following hierarchy as a possible means to select suitable evidence for policy making⁶.

1. Systematic reviews (meta-analyses) of multiple randomised trials⁷.
2. High quality randomised trials.
3. Systematic reviews (meta-analyses) of natural experiments and before-after studies.
4. Natural experiments (quasi-experiments).
5. Before-after (pre-post) studies.
6. Expert opinion and theoretical conjecture.

Agencies should refer to the NSW Government Evaluation Toolkit⁸ for further guidance and definitions for these techniques.

Evidence higher on the hierarchy is preferred, where it can be established that the evidence addresses issues comparable to those encountered in an advertising campaign. The supporting evidence should also present a clear link back to the campaign being analysed. This requires consideration of factors such as the comparability of different campaigns, relevance to different jurisdictions and the timeliness of the evidence base.

The focus of advertising varies from campaign to campaign, and circumstances can arise where relevant evidence may not always be available. In these cases, agencies should seek further advice from Treasury or guidance documents. Such circumstances highlight the importance of completing a post-implementation review of advertising campaigns.

The quality of post-implementation reviews will depend on the existence of appropriate data collection and monitoring processes, or establishing these from the inception of a campaign. Monitoring should particularly focus on quantifying the effect size. Information gathered in these reviews will help address any lack of evidence and improve the quality of future campaign evaluations.

1.5 Option identification

The NSW Handbook for Government Advertising⁹ details a range of objectives that campaigns should be used to achieve. Government advertising campaigns usually aim to induce behavioural change in a manner that enhances community welfare - for example, encouraging behaviour that improves public health or safety, or providing information that promotes more efficient use of public services.

⁵ "What evidence should social policymakers use?", Leigh, A., *Economic Roundup* (2009), <http://andrewleigh.org/pdf/EvidenceHierarchy.pdf> (accessed 4/12/14).

⁶ Preference should also be given to studies that are published in high-quality journals, use Australian data, are recent, and are similar in scale, scope and objectives.

⁷ Randomised trials or randomised controlled trials (RCT) use randomised groups to evaluate the impact of a program, policy or advertising campaign. A RCT randomly selects the treatment (those who view an ad) and control (those who do not) groups. The control group should mimic a counterfactual, allowing the RCT to isolate the effect of a campaign from other factors.

⁸ See http://www.dpc.nsw.gov.au/programs_and_initiatives/policy_makers_toolkit/evaluation_toolkit (accessed 5/1/15)

⁹ NSW Government Advertising Handbook, NSW Government, http://www.advertising.nsw.gov.au/sites/default/files/downloads/page/advertising_handbook_december_2015_v4.pdf (accessed 4/04/17).

Agencies normally have a range of options to achieve behavioural change through addressing information gaps, thereby assisting individuals make better decisions. Government advertising is often part of a coordinated response to the existence of undesirable behaviour. Other policy responses can include regulations or incentives. Also, a single advertising campaign can employ alternative marketing mixes or campaign timing and frequency, and each mix will have different costs and benefits.

A rigorous CBA should evaluate and compare a range of realistic options to achieve an objective (including the status quo) in order to identify the most beneficial option. For government advertising campaigns, an agency should focus particularly on the most beneficial media mix and campaign timing. The CBA should inform a decision maker not only whether advertising itself is economically beneficial, but what mix and timing of advertising is most beneficial - for example, whether a television and print campaign is likely to be more beneficial than an online and radio campaign. Ideally, options should be identified at an early stage of campaign development.

Chapter 2: Economic Costs

The primary costs faced by members of the NSW public as a result of government advertising are:

1. Government costs;
2. Private costs; and
3. Negative externalities.

2.1 Government costs

The NSW Government can invest in a range of advertising campaigns as outlined in Chapter 1. These campaigns have costs for the government agency implementing the campaign. All government resources directed towards a campaign have an opportunity cost. That is, they could have been valuably directed towards an alternative use. As such, all Government resources directed towards a campaign represent an economic cost.

As outlined in Section 3(1) of the *Government Advertising Act 2011*, the main government costs incurred by a government agency in implementing a campaign include, but are not limited to:

1. Research for the purpose of the campaign;
2. Production or carrying out of the campaign (including any capital costs);
3. Media distribution costs (such as the airtime of a television campaign); and
4. Evaluation of the likely or actual effectiveness of the campaign.

All government costs attributable to the campaign, both pre- and post- campaign are to be included in the CBA.

2.2 Private costs

Government advertising campaigns implemented by the NSW Government can also result in a cost for private parties in NSW who alter their behaviour in response to the campaign. For example, in response to a bushfire safety campaign, a NSW resident might change their

behaviour by spending time to document a bushfire safety plan and by spending money to upgrade the bushfire protection of their home.

All costs borne by private parties who alter their behaviour in response to a government advertising campaign have an opportunity cost and could have been valuable directed towards an alternate use. This includes spent time, as this forgoes the opportunity for leisure time.

Private costs should generally be described qualitatively, unless evidence suggests that private costs are likely to be significant. If there is expected to be a large degree of behavioural change and if the behavioural change is expected to involve the expenditure of significant time or money by private parties, then there may be a need to quantify private costs.

2.3 Negative externalities

When a government advertising campaign is run in NSW, third parties in NSW may experience negative side effects as a result of the campaign. These third parties are external to the private parties who have changed behaviour as a result of the campaign. An example could be increased congestion for existing passengers on public transport, if a campaign was effective in encouraging public transport use.

These negative side effects are referred to as negative externalities. A negative externality can be measured by what a private party is willing to pay (WTP) to avoid the unwanted side effects associated with the campaign. There are a variety of methods that can be used to estimate WTP. Chapter 5 section 5.1 provides further guidance on estimating WTP.

Negative externalities are not commonly associated with government advertising campaigns. However, if there is a clear case of a negative externality, it should be attempted to be quantified where possible. Consideration should be given to the existing evidence base when deciding on quantification.

Chapter 3: Economic Benefits

The primary benefits to members of the NSW public as a result of government advertising are:

1. Avoided government costs;
2. Avoided private costs; and
3. Positive externalities.

There are three key steps in estimating the economic benefit of a government campaign:

1. Estimating the effect of the campaign on behavioural change;
2. Estimating the impact of the behavioural change on outcomes; and
3. Estimating the value of the change in outcomes.

3.1 Avoided government costs

The objective of a government advertising campaign is to elicit a change in behaviour that leads to an improvement in society's welfare. The previous behaviour of members of the public may have had a cost to government.

For example, drink driving (the behaviour) can have a range of costs including the costs incurred by government in providing police, ambulance and public hospital services to respond to a traffic incident resulting from drink driving.

There is an opportunity cost tied to these expenditures because, had drink driving not occurred, the resources directed to respond to the traffic incident could have been directed towards other objectives, such as treating another patient in the hospital. If a government advertising campaign was effective in reducing drink driving, the avoided costs of this undesirable behaviour would represent an economic benefit as resources are freed up for alternative uses.

The concept of avoided government costs may apply to a range of government campaigns. The avoided cost is calculated by comparing the costs to government with and without the campaign, focussing on the change that is directly attributable to the campaign. Common forms of avoided government costs might include avoided labour costs, other direct costs of service delivery, indirect overhead costs or administration costs.

3.2 Avoided private costs

If a private party decides to engage in a certain behaviour, then it is assumed that their private benefits are greater than their private costs of that behaviour¹⁰. Either that, or there is some form of information failure impeding a rational decision.

As explained in Chapter 1, Government campaigns aim to address market failures associated with information, such as imperfect information or information asymmetries.

If a NSW Government campaign effectively addresses these issues, then private parties in NSW may alter their behaviour in response to the campaign. The behaviour of the private party prior to the campaign may have had associated private costs. By changing this previous behaviour, these private costs may be avoided.

For example, if there was proven to be an information failure in drivers' understanding of the risk of speeding, then a government advertising campaign might be able to provide this information. If the campaign was effective and reduced the number of speed related crashes on roads, then there would be an avoided private cost for drivers in the form of avoided injury or avoided loss of life.

In the first instance, the value of an avoided private cost should be measured using a market price. However, in the case of behavioural changes, there may not be a market available for the output. In this case, the value of an avoided private cost can be measured by a private party's willingness to pay (WTP) to avoid this private cost. There are various methods that can be used to estimate WTP. Chapter 5 section 5.1 provides further guidance on estimating WTP.

The difference between WTP and price is referred to as consumer surplus and is the net economic benefit of a NSW government advertising campaign to NSW private parties. As explained in Chapter 2 Section 2.2, the private costs (or aggregate price) for NSW private parties may need to be treated quantitatively if they are likely to be significant.

¹⁰ This is called 'revealed preference' – i.e., deducing that people prefer a certain good or service from the way they behave, rather than what they say ('stated preference'). The distinction between stated and revealed preference is important because a survey, if not well designed or validated, can lead to overstatement of preferences by survey respondents and therefore to potentially erroneous estimates of 'willingness to pay'.

Avoided private costs are sometimes quantified as an economic benefit of a government campaign. Whether or not avoided private costs are relevant to a CBA will depend on the nature of the behavioural change being targeted. In some cases there may not be avoided private costs, but only avoided public costs.

3.3 Positive externalities

When a government advertising campaign is aired in NSW, third parties in NSW may experience positive side effects as a result of the campaign. These third parties are in addition to the private parties who have changed behaviour.

An example could be reduced waiting times for customers who continue to use face-to-face services while a government campaign is effectively encouraging other face-to-face customers to receive the same service online. The customers that continue to use the face-to-face services experience less congestion as a result of other customers changing their behaviour.

These positive side effects are referred to as positive externalities. A positive externality is measured by what a private party is willing to pay (WTP) to experience the positive side effect associated with the campaign. There are a variety of methods that can be used to estimate WTP. Chapter 5 section 5.1 provides further guidance on estimating WTP.

Positive externalities are occasionally associated with government campaigns, although they are not usually the key benefit category. If there is a clear case of a positive externality, effort should be made to quantify it where possible. Agencies should consider the quality of existing evidence when deciding on quantification of positive externalities.

Chapter 4: Overall Evaluation

The final results of a CBA provide decision makers with an assessment of the value of a government advertising campaign in terms of overall welfare. In this sense, welfare refers to the general well-being of NSW residents considering a range of market and non-market factors such as economic, social and environmental factors. The final results are:

1. A net benefit (or cost)¹¹; and
2. A benefit-cost ratio (BCR).

4.1 Final results

The final result of a CBA for a government advertising campaign is a Net Present Value (NPV) and a Benefit Cost Ratio (BCR). A NPV is the difference between the quantifiable costs and benefits of the campaign, discounted to present day values using a discount rate¹². A BCR is the ratio of the present value of benefits to the present value of costs.

¹¹ Note: the net benefit (or cost) is presented as a Net Present Value (NPV) when costs and benefits occur in a future year.

¹² The NSW Government Guide to Cost-Benefit Analysis (TPP17-03) specify the standard discount rates to be used for all CBAs. A real discount rate of 7% should be applied, with sensitivity testing at both 10% and 3%.

As noted above, agencies will need to calculate how the effects, and costs and benefits, of a campaign decay over time. Given the level of uncertainty, especially in the long term, agencies should take a conservative approach. Therefore, a shorter period of analysis should be favoured unless there is strong evidence that the campaign will continue to change behaviour in the long term, e.g. when a campaign is staged over a longer interval.

Attributing behavioural changes to an campaign becomes increasingly difficult over longer time periods as the range of possible explanatory factors increases. Agencies should consult with Treasury in these circumstances.

Agencies should undertake sensitivity testing where benefits or costs are uncertain, in order to present a meaningful range within which the results may be expected to lie. In particular, it is important to test sensitivity of the results to assumptions on effect size, attribution rate and decay profile, particularly where the evidence is weak or dubious. Besides the central estimate, a 'worst case scenario' should be estimated reflecting the most conservative estimated benefits and the most aggressive estimated costs.

4.2 Interpretation

It is important that the results of a CBA for a government advertising campaign be interpreted correctly, to ensure the CBA provides useful information in decision-making. A CBA is designed to examine the benefits and costs of a government campaign in terms of net welfare effects and compare this with the benefits and costs of other options, including the base case to 'do nothing'.

Where benefits are greater than costs (i.e. $NPV > 0$, $BCR > 1$), the campaign is viewed as increasing overall welfare. Where costs are greater than benefits (i.e. $NPV < 0$, $BCR < 1$), the campaign is viewed as reducing overall welfare. Consideration of qualitative costs and benefits can supplement the analysis.

A positive NPV and a BCR greater than one does not necessarily mean that the campaign is the best option to achieve the stated objective, since more than one option can potentially meet these criteria. An agency should compare the NPV and BCR of different options (i.e., different marketing mixes or campaign timings, or other policy options to achieve the same objective, such as regulation) to help ensure the most efficient allocation of government resources to achieve the objective of behavioural change.

An agency should present the quantitative results (NPV, BCR) of a CBA for a government advertising campaign, along with an outline of the:

1. Economic benefits and economic costs that have been quantified;
2. Inputs and assumptions used in the quantification;
3. Sensitivity analysis performed on the final results; and
4. Qualitative economic benefits and economic costs that have not been quantified.

Providing this information comprehensively in the CBA will allow decision makers to read the NPV and BCR in the context of the entire CBA. This will ensure that the CBA provides a useful decision making tool.

Chapter 5: Post-Implementation Review

The NSW Government Advertising Handbook states that agencies should conduct evaluation that is relevant, cost-effective and meaningful in order to measure the success of their advertising against its stated objectives. This Chapter describes a suitable approach for designing a review that will deliver useful information for CBA, particularly where there is limited prior evidence.

Limitations on the quality and amount of applicable evidence available to inform assumptions can hinder the CBA of government advertising campaign and ultimately limit the rigour and reliability of the CBA.

In particular, agencies may face situations where there is insufficient evidence available to quantify or monetise the economic benefit of a campaign, because there is little data on the effect size of the campaign or the value of the behavioural change.

In these circumstances, an agency should question the merit of conducting any larger scale advertising campaign over \$1 million. A practical option might be to conduct a small scale pilot campaign complemented by a post-implementation review to assess the effectiveness of the campaign.

The results of the review would be crucial in establishing a preliminary evidence base, which would be useful for informing the assumptions of future campaigns. Consideration might also be given to a post campaign CBA based on the data collected as part of the post-implementation review. The consistent application of post-implementation review to government advertising campaigns can also build the evidence base for the CBA of future campaigns, including informing key assumptions regarding the benefits of government advertising campaign.

Agencies should aim to establish procedures for ongoing monitoring and post-implementation review of advertising campaigns, as well as approaches for using the results to guide the design and evaluation of future campaigns. Ideally, the mechanisms for collecting data to inform the post-implementation review should be built into the design of the advertising campaign.

The following sections set out methods to be employed and data to be collected when reviewing government campaigns. The focus of such reviews should be to isolate and identify the effect of a campaign through observed behavioural changes. Where appropriate, reviews could also seek to value this change.

For further guidance on the general approach to post-implementation review refer to the *NSW Government Guide to Cost-Benefit Analysis*¹³ (TPP17-03).

5.1 Methods

The evidence hierarchy outlined in Section 1.3 also provides a useful framework for considering the methods to be applied in a post-implementation review. Randomised-control trials (RCTs)

¹³ NSW Government Guide to Cost-Benefit Analysis (TPP17-03), NSW Treasury <https://www.treasury.nsw.gov.au/sites/default/files/2017-03/TPP17-03%20NSW%20Government%20Guide%20to%20Cost-Benefit%20Analysis%20-%20pdf.pdf> (accessed 31/03/17).

and natural experiments are largely preferred to 'before and after' analysis, for their ability to isolate the effect of an advertising campaign from other variables¹⁴.

However, practical limitations can make the use of these methods infeasible. In these cases, before and after analysis is an appropriate alternative for post-implementation review, provided the outcomes measured in the "after" scenario can distinguish the impacts of the campaign from the impacts of other factors.

When designing a before and after analysis, careful consideration will need to be given to isolating and identifying the effect of the campaign from the effects of other factors. Therefore, the impact of other policies and environmental factors on behavioural change will need to be accounted for. It is also important to minimise any optimism bias.

The ability to conduct a sound post-implementation review will be largely affected by the quality of data collected. Agencies should employ appropriate processes for collecting and monitoring data from the campaign that focus on evaluating its effect on behavioural change.

5.2 Data sources

The data used to inform key assumptions can come from a range of sources, including post-implementation reviews and willingness to pay (WTP) surveys. The evidence hierarchy outlined in Section 1.3 provides a useful framework for considering the quality of the evidence base arising from these data sources.

For a post-implementation review, agencies should focus on quantifying and valuing the observed behavioural change, as part of a package of information on key assumptions and actual costs. A major source of data will be direct observations of behavioural change that measure the actual outcome attributable to the campaign. An example would be changes in fatalities during a road safety campaign.

Primary surveys may support direct observations by providing evidence for attributing the behavioural change to the campaign. An example might be asking individuals whether their sun protection behaviour was influenced by availability of sun safety products, social pressures, health concerns or government advertising.

There are a variety of specialised techniques designed to estimate willingness to pay, including choice modelling, stated preference surveys and contingent valuation.

Measuring WTP is a specialised field and the quality of survey results can vary widely across different topics and techniques. It is essential to undertake appropriate validity tests on WTP survey data. It needs to be shown that estimates generated by WTP surveys are similar to those that would be generated if real payments were made; similar to results that might arise from revealed preference tests; and reflect economic principles and good study design. Examining factors such as survey design, focus group testing, payment mechanisms, peer review and so on may contribute towards validation of results and provide an indication of the quality of a data source.

¹⁴ Agencies should refer to the NSW Government Evaluation Toolkit for further guidance and definitions on these techniques, http://www.dpc.nsw.gov.au/programs_and_initiatives/policy_makers_toolkit/evaluation_toolkit (accessed 5/1/15).

The quality of a WTP estimate can ultimately only be determined by examining the detail of the report and the extent to which validation procedures were undertaken and documented. As such, the relevance and validity of WTP surveys as a data source should be judged on a case by case basis. Agencies should consult Treasury where uncertainty remains.

Appendix 1: CBA Summary - Reporting Template

Campaign	BCR	NPV	Key Drivers of Benefits (e.g. key assumptions on Effect Size, Attribution Rate, Decay Profile, time period of campaign, etc.)	Further Work Required (if any)	Comments and Qualifications
					<ul style="list-style-type: none"> • Consistent with NSW Government Guide to Cost-Benefit Analysis (TPP17-03)? YES/NO • Consistent with CBA Framework for Government Advertising? YES/NO • Conservative assumptions & robust evidence? YES/NO