



Department
for Transport

Value for Money

Supplementary guidance on categories

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Department for Transport

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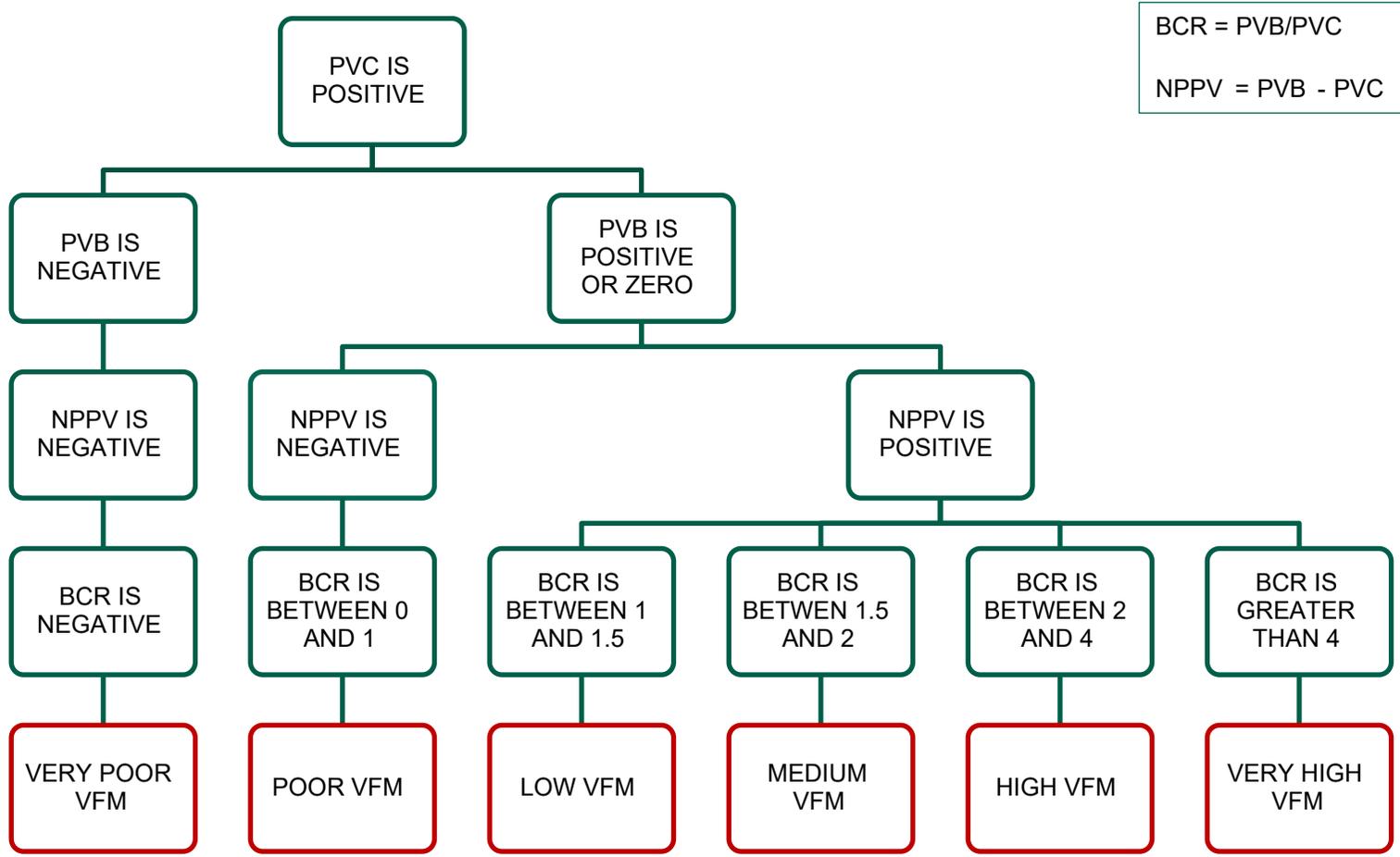
1. How are Value for Money Categories Defined?

- 1.1.1 The Value for Money Categories used by the Department for Transport (DfT or “the Department”) are outlined in the [Value for Money Framework](#). This supplement provides greater detail on how these categories are determined, and is intended for use by the appraisal practitioner only.
- 1.1.2 As discussed in the Value for Money Framework, the value for money category of a proposal is defined in terms of what the expected value of the Benefit Cost Ratio (BCR) or Net Present Public Value (NPPV) would be when all risks, uncertainties and impacts are considered.
- 1.1.3 This expected value of the BCR or NPPV corresponds to that calculated from the expected values of the Present Value of Benefits (PVB) and Present Value of Costs (PVC) when all these factors are considered.¹
- 1.1.4 In cases where non-monetised impacts and consideration of risk and uncertainty are not material to the Value for Money (VfM) assessment, these values correspond to those used in the adjusted or indicative value for money metrics. Important exceptions to this are discussed in detail in [Chapter 2](#) of this document.
- 1.1.5 In standard cases, where the costs of a proposal to the Broad Transport Budget exceed the revenues it returns, the PVC is positive.² **Box 1.1** provides the definition of the six relevant categories. In these cases, the BCR is the most useful and interpretable value for money metric and should be reported to decision-makers.
- 1.1.6 In cases where revenues exceed costs, the PVC is negative. **Box 1.2** provides the definition of the four relevant categories. In these cases, the NPPV is the more informative and interpretable metric and should be reported.
- 1.1.7 In cases where a proposal has no significant costs or revenues to the Broad Transport Budget, the PVC is zero or negligible. **Box 1.3** provides the definition of the two relevant categories. In these cases, the NPPV is the more informative and interpretable metric and should be reported.

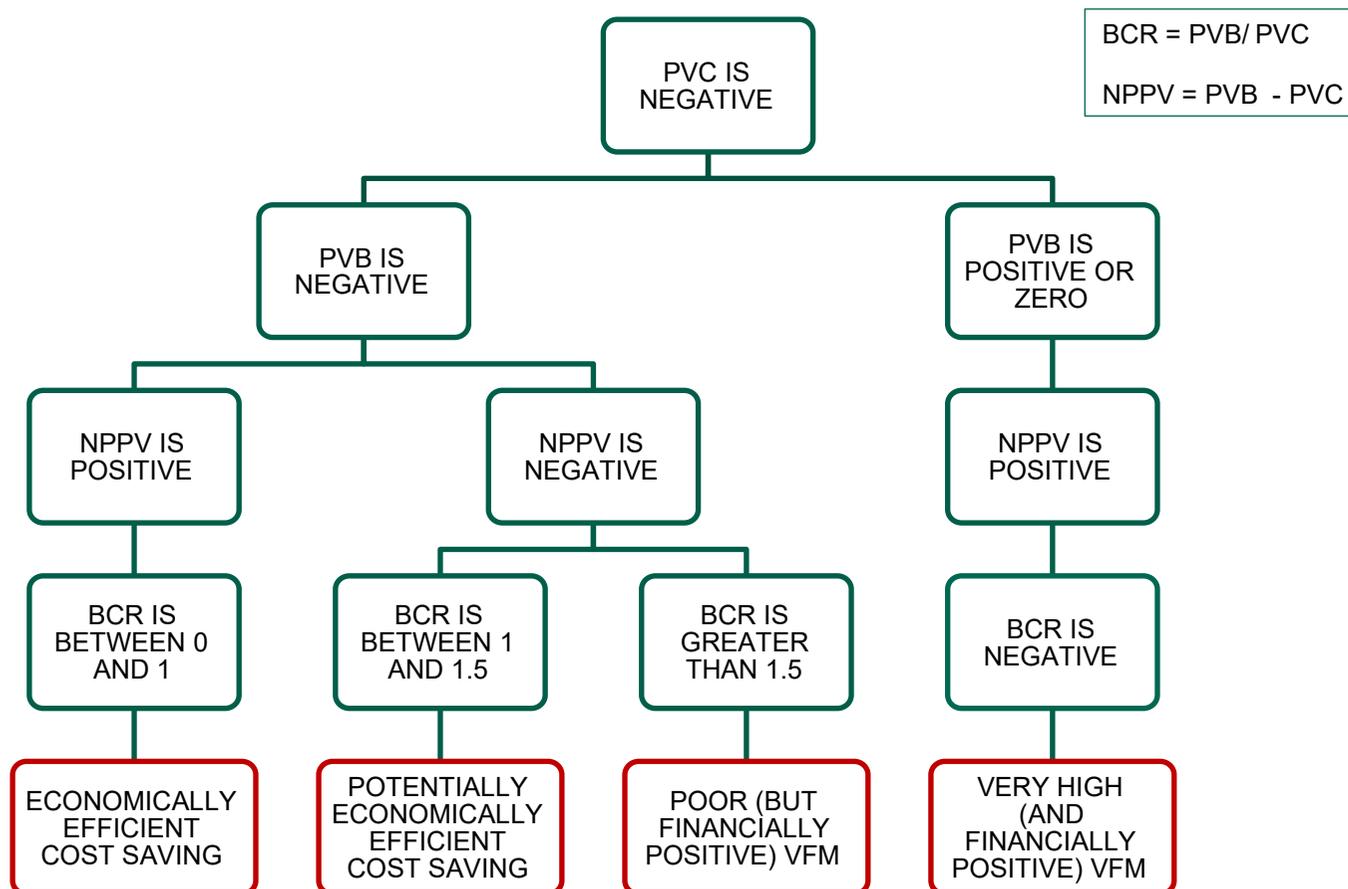
¹ For the BCR, this requires the assumption that risks to the PVB and PVC are uncorrelated, which is reasonable in most cases. This follows from the fact that it can be shown that $E[A/B]=E[A]/E[B]$, when A and B are uncorrelated.

² This also means revenues are treated as a negative cost rather than a benefit.

Box 1.1 Identifying a VfM category when the PVC is positive



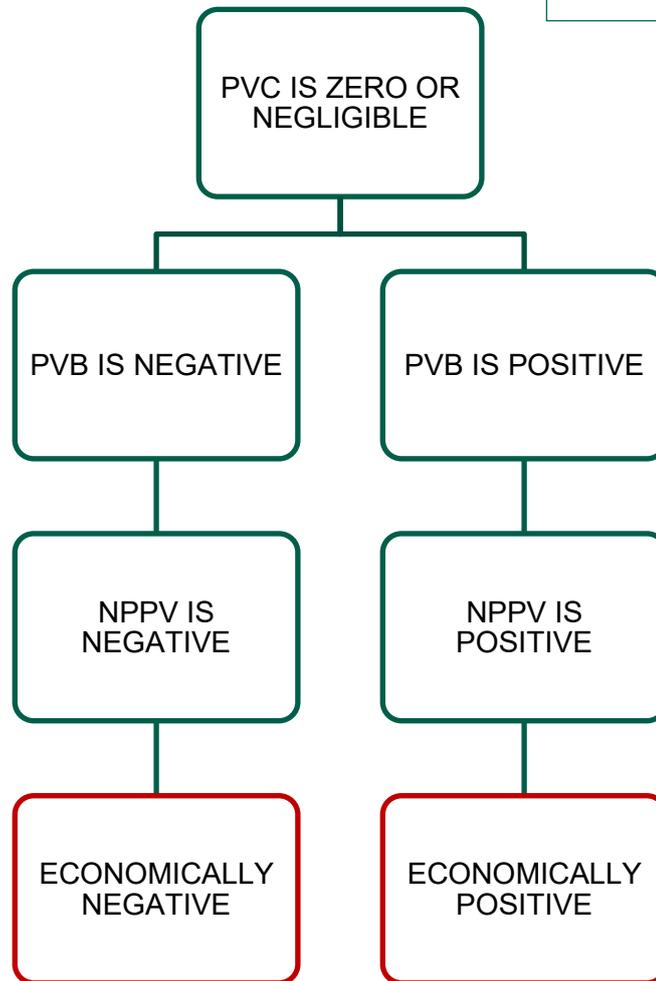
Box 1.2 Identifying a VfM category when the PVC is negative*



* If both PVC and PVB are negative, then the benefit cost ratio value is positive ($-PVB / -PVC = +BCR$). So a higher BCR value under a negative PVB means value for money gets worse.

Box 1.3 Identifying a VfM category when the PVC is zero or negligible

$$\text{NPPV} = \text{PVB} - \text{PVC}$$



2. How to Arrive at a VfM Category

2.1 Overview

- 2.1.1 The VfM category is the key output of the appraisal approach that the Department has developed over many years, and the process for arriving at a category is explained in this section.
- 2.1.2 In some cases, the evidence from a value for money assessment will clearly point to one value for money category. The category indicated by the adjusted value for money metric provides a sufficiently accurate assessment of what the expected value of the Benefit Cost Ratio (BCR) or Net Present Public Value (NPPV) would be when all risks, uncertainties and impacts are considered.
- 2.1.3 However, where one (or more) of the four issues below are identified, arriving at a VfM category is more complex. In order to finalise the VfM assessment, it is necessary to take a view on impacts that are not reflected in the adjusted VfM metric (and by extension, the initial VfM metric) and whether together they suggest the value for money category should be shifted up or down.
- **Indicative monetised impacts:** if there are significant monetised impacts that are not included in the adjusted BCR or NPPV, these can be included in the indicative metrics subject to criteria being met.
 - **Non-monetised impacts:** if there are significant non-monetised impacts.
 - **Sensitivity analysis:** if uncertainty in the adjusted and indicative BCR or NPPV parameters and assumptions is tested through sensitivity analysis.
 - **Potential biases:** if there are potential biases in adjusted BCR or NPPV impacts that are not considered through sensitivity analysis.
- 2.1.4 The remainder of this section outlines a basis for understanding when this is the case and how to assign VfM categories in those circumstances.

2.2 General approach

- 2.2.1 If one or more of the four cases discussed above arise, a general approach based on 'switching values' is recommended.
- 2.2.2 Switching values represent the extent to which the Present Value Benefits or Present Value Costs would need to increase or decrease for the VfM Category of the proposal to change (see Box 2.1 for an example).

Box 2.1 Hypothetical example of how to determine switching values

Example: Assume a proposal has an adjusted BCR of 1.8 (PVB £180m and PVC £100m) suggesting Medium value for money. By how much would the PVB and PVC have to change for the proposal's value for money category to increase to High?

Answer: PVB would have to rise by at least £20m or the PVC would have to fall by at least £10m for the adjusted BCR to increase to 2.0.

- 2.2.3 Analysis is then used to form a judgement as to how likely this increase or decrease is to be realised and whether or not the final VfM category should be changed based on this likelihood. Box 2.2 below provides some examples of VfM category judgements.
- 2.2.4 The rationale and uncertainties in assigning a VfM category should be communicated clearly to decision-makers in the Value for Money Statement. Guidance on reporting value for money can be found in the [Value for Money Framework](#).
- 2.2.5 In some cases, it may not be possible or useful to assign a single category, because the likelihoods of the proposal falling into each of the two categories are close, or simply unknown. In such cases, it is recommended that a 'hybrid category', such as 'Medium-High' is reported and explained. It is useful to report this together with the criteria required for it to deliver the 'better' or 'worse' category.

Box 2.2 Examples of category judgements

- a. *"The proposal is judged to represent High value for money. There is a slight risk that this could fall to Medium if real construction cost inflation turns out significantly higher than in our central case, as tested in the sensitivity analysis."*
- b. *"The VfM category of this proposal depends on the weight attached to the landscape impacts and the value of the regeneration benefits from the development. Our view is that the proposal is likely to offer Low-Medium value for money. It is unlikely to offer Low value for money unless we assume the worst case on landscape impacts, which we do not consider reasonable."*
- c. *"The proposal represents High-Very High value for money. If demand growth continues as assumed in the central case, it is most likely that the proposal will deliver Very High value for money, but future demand growth is uncertain and lower demand growth cannot be ruled out."*
- d. *"The VfM assessment suggests that the proposal offers High value for money with an adjusted BCR of 2.1. There is a risk that this could fall to Medium value for money in the likelihood that capital costs rise by 10%, as shown in the sensitivity testing. However the proposal is expected to deliver improved accessibility for public transport users, which is a non-monetised benefit. This benefit is judged sufficient to outweigh the impact of this increase in capital cost. Therefore we have assigned a High VfM category."*

2.2.6 The following sections provide guidance on how to apply the ‘switching values’ approach described above to each of the four cases outlined in Section 2.3.

Indicative monetised impacts

2.2.7 As discussed above, some monetised impacts are not sufficiently widely accepted, well-researched or tried-and-tested to include in the adjusted BCR or NPPV and the monetary value ascribed to them is considered indicative.

2.2.8 However, for some relevant schemes, as part of the final stage of the value for money assessment, indicative impact metrics (BCR and NPPV) can be estimated and reported alongside the initial and adjusted metrics in the Economic Case and Value for Money Statement.

2.2.9 The indicative impacts – subject to certain criteria being met³ - can be included in the indicative BCR where a strong justification for their robustness and relevance can be demonstrated in the economic dimension. The indicative BCR should also include a range of scenarios and sensitivities to reflect the high degree of uncertainty associated with indicative impacts.

2.2.10 Indicative impacts that do not meet the criteria for inclusion can be included as a ‘switching value’ in the VfM assessment. This determines whether inclusions of any of these indicative impacts in the appraisal imply a VfM Category different from that suggested by the adjusted and/or indicative BCR or NPPV.

2.2.11 Before applying the switching value approach, it is important to identify whether any of these remaining indicative impacts double-count benefits that are already accounted for in the relevant adjusted and/or indicative BCR or NPPV and, if so, remove them from the adjusted metric.

2.2.12 If at least some of the results from the switching values analysis point to a different VfM category than that implied by the adjusted and/or indicative BCR or NPPV, an assessment should be undertaken to determine if the VfM category should change. There are various approaches which might be adopted, for example:

- assessing the combined likelihood of the results which imply a different VfM Category; or
- estimating the average costs/benefits based on assumptions about the probability distribution of the different scenarios.

2.2.13 Box 2.3 provides an example of how monetised uncertainties may inform a proposal’s value for money category in practice.

2.2.14 In some cases, where there is a great deal of uncertainty, it may be best to focus on a ‘what would need to be true’ approach. For example, “how much would we need to value the developments dependent on the proposal for the

³ Please see value for money framework for further details. <https://www.gov.uk/government/publications/dft-value-for-money-framework>

proposal's VfM category to fall?" or "how much more do we need to value landscape impacts than security impacts for the proposal to be Medium VfM?".

- 2.2.15 Finally, as set out in the [Value for Money framework](#), the adjusted BCR should still inform the provisional value for money category. The indicative VfM metric(s), other indicative and non-monetised impacts, as well as scenarios and sensitivity tests should then be considered to determine the final value for money category.

Box 2.3 Example of how indicatively monetised impacts may inform a VfM category

Assume a hypothetical transport proposal has an adjusted BCR of 1.8 (PVB £1800m; PVC £1000m) implying 'medium' value for money. The proposal is expected to unlock some dependent developments, and 8 scenarios are tested around the additionality of the value of the development (how much of the benefit would occur without the transport scheme) and how well-occupied it is.

The table below shows the benefit (discounted and deflated, in millions of pounds) associated with these different scenarios:

Additionality	100% occupancy	90% occupancy
60%	3,000	2,900
24%	950	800
20%	700	600
15%	400	188

For the purposes of this example, land value uplift is the only monetised indicative impact and is judged not to be robust enough to include in an indicative BCR but, can be considered alongside non-monetised impacts to determine the final VfM category.

Question: Does the evidence on land-value uplift provide sufficient evidence to increase the proposal's value for money category to High?

The switching value is £200m. In only one of the scenarios was the expected welfare benefit from the dependent development less than this switching value. This was only when very conservative assumptions about additionality were made and assumed that only 90% of the development was occupied. Expert understanding of additionality and trends around occupancy suggest that this would form an unreasonably conservative scenario.

It is judged most likely that the benefit from the dependent development will exceed the switching value and the proposal is assigned to the High VfM category.

"This proposal represents High value for money. In addition to the user benefits which give an adjusted BCR of 1.8, there are expected to be further benefits from the unlocking of property development. Scenario tests indicate that these developments are very likely to provide sufficient further benefit to ensure that the proposal provides benefits more than double that of its costs to the transport budget. We would have to make strongly conservative assumptions about both additionality and occupancy rates

for this to fall to medium value for money. This is judged to be unrealistic, given the demand for and scarcity of properties in the area”.

Non-monetised impacts

- 2.2.16 Further to those in the adjusted and/or indicative BCR or NPPV, there are often some impacts in a value for money assessment that are not monetised.
- 2.2.17 To use these impacts to inform a value for money category, it is necessary to first determine whether the net impact of the non-monetised impacts is likely to be positive or negative. For example, does the positive impact on security of a proposal outweigh a negative impact on townscape?
- 2.2.18 Following on from this, the likely scale of this net impact should be considered. This may refer to evidence on what the monetary value of impacts would be (caveated by concerns about robustness of these estimates) or to evaluate evidence from similar proposals.
- 2.2.19 It should be noted that the TAG scales used to assess non-monetised impacts ranging from 'large adverse' to 'large beneficial' are not always directly comparable across impacts. They may represent different welfare impacts, such that 'large adverse' in terms of townscape may have a different impact on public value than a 'large adverse' impact on severance, for example.
- 2.2.20 In a similar fashion to indicative monetised impacts, an approach which considers 'what would need to be true?' may be useful to illustrate the effect on value for money conclusions of non-monetised impacts. Box 2.4 provides an example of this.

Box 2.4 Example of how non-monetised impacts may inform a VfM category

Assume a hypothetical transport proposal has an adjusted BCR of 2.1 (PVB £210m; PVC £100m) implying High value for money.

There are expected to be large beneficial 'security' impacts because the scheme involves dramatic changes to surveillance and lighting systems. However, there are moderate adverse impacts on the historic environment. The proposal reroutes a road closer to, and attaches modern lighting and other security equipment to, some buildings of historic significance, restricting views and scarring them.

Question: Do the non-monetised benefits provide sufficient evidence to reduce the value for money category to Medium?

The benefits would need to be £10m lower than the adjusted BCR estimate to reduce the VfM category to Medium.

The adverse impact on the historic environment is judged to be significantly larger than the large beneficial security impact, and so the net impact is negative. The importance of

the buildings for the area and monetised evidence from recent stated preference studies, suggests the net impact should be valued well in excess of £10m. The proposal therefore most likely falls into the Medium category:

“The proposal represents Medium value for money. The majority of its user benefits result from travel time savings and some improvements to reliability. Despite having an adjusted BCR of 2.1, the adverse impact of the proposal on the historic environment is judged to sufficiently outweigh the positive impacts on security from improved lighting and surveillance to reduce the value for money category to Medium.”

Sensitivity analysis

- 2.2.21 As discussed in the Value for Money Framework, sensitivity analysis is recommended to test the impact of key risks and uncertainties. To use the results of sensitivity analysis to inform a value for money category, it should first be considered whether any of the sensitivity tests imply a VfM category different from that suggested by the adjusted and/or indicative BCR (using the ‘switching value’ approach).
- 2.2.22 If at least some of the sensitivity tests imply a different VfM category, an assessment should be undertaken whether the VfM category should change. There are various approaches which might be adopted, for example:
- assessing the combined likelihood of those sensitivity tests which imply a different VfM category; or
 - estimating the average costs/benefits based on assumptions about the probability distribution of different sensitivity tests.

Box 2.5 Example of how sensitivity analysis may inform a proposal’s VfM category

Assume a hypothetical transport proposal has an adjusted BCR of 1.8 (PVB £180m; PVC £100m) implying Medium value for money. Assume that sensitivity testing has been undertaken on user benefits assuming high/low values of travel time saved (VTTS). This has resulted in user benefits of:

- Central estimate = £100m (included in the adjusted BCR)
- High VTTS sensitivity test = £130m
- Low VTTS sensitivity test = £90m

Question: Do these sensitivity tests provide sufficient evidence to increase the proposal’s value for money category to ‘high’? The proposal’s benefits would need to be £20m higher than the central estimate (£180m) to increase the VfM category to ‘high’.

User benefits are estimated to be £30m higher in the high VTTS sensitivity test, implying 'high' VfM. As a result, it is possible that these sensitivity tests may change the VfM category of the proposal.

Assuming that each of the three estimates for user benefits is equally likely, the average estimate for user benefits is £107m ($=[\text{£}100\text{m}+\text{£}130\text{m}+\text{£}90\text{m}]/3$). This is less than the switching value required to change the VfM Category, and it is thus judged that these sensitivity tests do not provide sufficient evidence to increase the VfM Category.

“This proposal represents Medium value for money. The largest user benefits are from journey time savings and reductions in both CO₂ and NO_x emissions contribute to an adjusted BCR of 1.8 and sensitivity testing on the value attributed to the journey time savings does not suggest that the VfM category is likely to rise to High.”

Potential biases

- 2.2.23 In some cases, there will be known biases in the adjusted and/or indicative BCR or NPPV impacts that are not tested through sensitivity analysis. This might be for example where models are known to use out-of-date data, or where a major potential cost is not properly considered in the analysis.
- 2.2.24 In such cases, knowledge about the uncertainty should still be used to inform the VfM category. The first step in this is to come to a reasoned judgement as to whether this is likely to lead to an over- or under-estimate of the benefits or costs and thus the BCR or NPPV.
- 2.2.25 The switching value for the PVB or PVC should then be calculated. In the case of potential biases it may be most useful to consider this as a percentage, rather than absolute change, as in the example in Box 2.6 below.
- 2.2.26 This allows an assessment to be undertaken as to whether the VfM category should change. This involves using available information to come to a judgement as to how likely it is that the bias in the adjusted BCR is sufficient for the switching value to be achieved.

Box 2.6 Example of how consideration of potential biases may inform a VfM category

Consider a hypothetical transport proposal, which has an adjusted BCR of 0.9 (PVB £75m; PVC £85m) implying Poor value for money.

Journey time savings for commuters are estimated to capture £60m (roughly 80%) of this PVB. However, the model that was used to produce this analysis used old values of travel time saved (VTTS) that have since been updated in TAG's data book.

Question: Do the new VTTS provide sufficient evidence to improve the VfM category of the proposal from Poor to Low VfM?

The benefits would need to rise by £10m in present value terms (~13%) for the VfM category to rise.

The new VTTS for commuters in the November 2016 data book are 46% higher than the old VTTS that were used in the modelling. If these values were applied, the PVB of journey time savings for commuters would rise from £60m to £88m. As a result, it is judged most likely that this increase in user benefits from better modelling would lead to an increase in total benefits in excess of the switching value. Therefore, the proposal is assigned to the Low VfM category.

“The proposal represents Low value for money. Although the central BCR is 0.9 (implying Poor VfM), we have not had sufficient resource to update the input parameters of the model to make use of the latest data. As a result, the adjusted BCR is highly likely to underestimate the user benefits, and using a more robust, up-to-date model would most likely increase the adjusted BCR to above 1.0.”