

Distributional and place-based analysis

Guidance Note for Towns

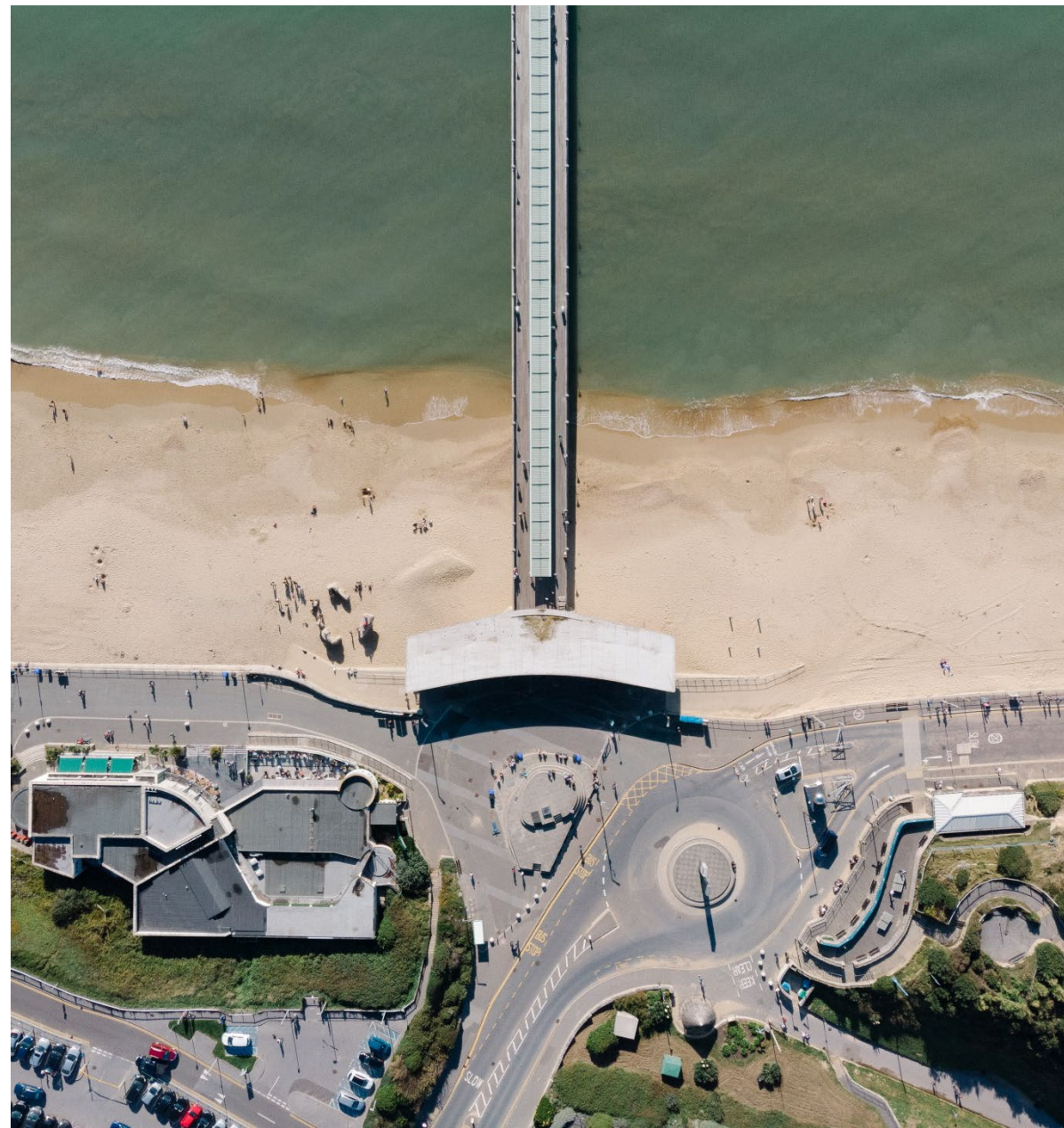
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1. INTRODUCTION

Purpose of this guidance

As you progress the Business Case for each of your projects, the Economic Case will provide an assessment of the overall value for money of each project through its Benefit/Cost Ratio (BCR).

However, an overall BCR alone does not demonstrate how the impacts of the project could vary between different groups – for instance, people in different income bands or people of different ages or spatial areas.

The revised Green Book, published in November 2020, set out a requirement to identify the potential distributional impacts on different groups of people, and to produce place-based analysis for proposals with a geographical defined focus. The Delivery Partner produced a [blog](#) and [guide](#) on the revisions to the Green Book.

This guide goes into more detail about the questions that towns should consider in approaching the distributional analysis required. It also identifies the place based analysis that can be applied where appropriate, with signposting to relevant guidance documents.

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Potential differential impact on different people within the target area must be identified



Place-based analysis is a new requirement for proposals with a geographical defined focus

Introduction to distributional analysis

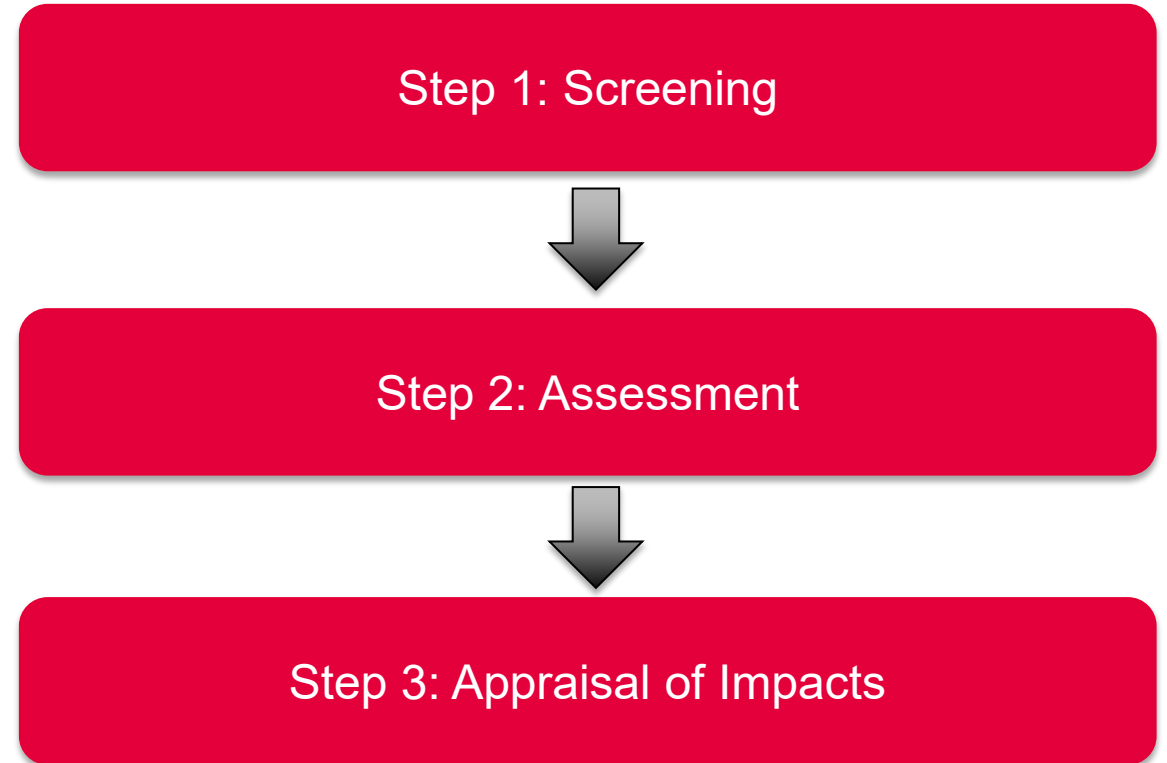
- Distributional analysis is important where there may be significant redistributive effects between different groups. This could be between demographic groups, income or geography.
- Distributional analysis can show which groups are likely to benefit most from a scheme and which may be most adversely affected (where applicable). Where there is likely to be a large beneficial impact for lower income groups, it is possible to apply weightings to reflect this in the cost benefit analysis and show an adjusted BCR that takes this into account.

Groups / types of distributional analysis to consider:

- Protected characteristic groups in line with the Equality Act
- Income
- Types of business
- Geography

Process

Distributional analysis follows a three-step process. First there is a screening element to make a judgment about whether further assessment is needed for any groups. If so, a qualitative or quantitative assessment follows. Where applicable, an appraisal of distributional impacts is then included in the Business Case.

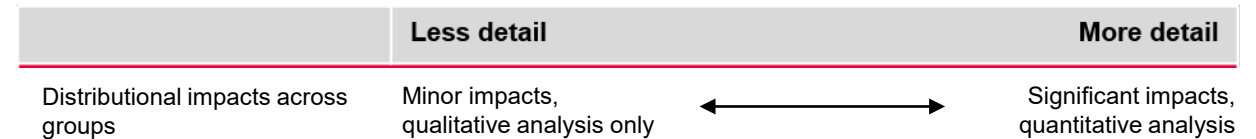


2. SCREENING

Proportionality

In carrying out distributional analysis, a proportionate approach needs to be taken. When there are unlikely to be distributional impacts, a qualitative statement will be sufficient to demonstrate that this has been considered. However, sufficient analysis needs to be carried out to demonstrate where there are likely to be large distributional impacts.

In order to decide what is appropriate, a set of questions should be considered to understand what the distributional impacts might be. The next page sets out some considerations that can help when judging how much detail is needed on distributional impacts.



Screening questions to consider

1. **Groups with protected characteristics:** working closely with the person leading the equality impact assessment (EqIA), identify which protected characteristic groups are likely to be most affected by the scheme. For further information about EqIA requirements, see the TFDP's guide on [Meeting the Public Sector Equality Duty](#). This also includes a template that could be used as part of the screening process.
2. **Income groups:** consider whether lower income groups are likely to benefit more from the scheme. Is the scheme targeted at specific income groups?
3. **Types of business:** Are particular sectors or business types likely to benefit more, e.g. small businesses or non profit community based organisations.
4. **Geography:** consider whether there is likely to be a difference in impacts across special areas or types of area (e.g. urban/rural)?

Screening assessment

Depending upon the likely extent of the impacts, the following analysis should then go on to be carried out:

Scale of distributional effect	Assessment required
Minor	Qualitative narrative only
Moderate to large	Quantitative distributional analysis
Significant	Where there is likely to be a very large impact on lower income groups, distributional weights can be applied to the adjusted BCR to reflect this

Demonstration of how distributional impacts have been considered should be provided at both the long list and short list stage of option selection.

3. ASSESSMENT

Qualitative vs quantitative assessment

Where distributional effects are likely to be limited, a qualitative assessment is sufficient.

Where there are likely to be large disproportionate effects on particular groups (beneficial or adverse), a clearly presented analysis identifying gaining and losing groups and estimating the effects on their welfare should be carried out.

The extent of the analysis will depend in part on the availability of relevant data on the affected group and whether there is spatially disaggregated data available.

Types of quantitative assessment include:

Tabulated results

Where the groups most affected by the schemes (beneficially or adversely) are known, this can be tabulated to present the groups that are most likely to benefit compared to the wider population.

GIS Mapping

Where spatially disaggregated data is available, GIS mapping of the affected groups onto a map with the scheme site identified can be carried out. In its simplest form this could be maps to show the demographics and income groupings in the local area of impact compared to the national average.

Using tabulated results

Simple tables can be used to demonstrate:

- the proportion of scheme beneficiaries that are from protected characteristic groups, compared to the wider population.
- the proportion of the scheme beneficiaries that are from particular income groups, compared to the wider population.
- the proportion of the Towns Fund support going to particular sectors / business types.

The assumptions used to complete the distributional tables should be reported in the Business Case.

An example methodology for preparing more refined distributional appraisal tables that incorporate spatially disaggregated data is provided in the DfT's Transport Analysis Guidance [Unit A4.2](#). Where data is available this can also be adapted to non-transport projects. However, a more simplified approach, such as the example on the next page, can also be taken.

Example table

Proportions by protected groups	Age (e.g. children aged 0-16)	Age (e.g. 70+)	Male	Female	Disability (e.g. limiting long term illness)
Proportion of beneficiaries of investment					
Proportion of local population					
Proportion of national population					
Proportions by income distribution quintiles	0-20%	20-40%	40-60%	60-80%	80-100%
Proportion of beneficiaries of investment					
Proportion of local population					
Proportion of national population	20%	20%	20%	20%	20%

This table is not exhaustive, but shows how a judgment can be made about the extent to which the characteristics of scheme beneficiaries (in this case, covering some of the protected groups and income groups) differ from the general population.

4. APPRAISAL OF IMPACTS

Monetised assessment

Adjusting total benefits using income based distributional weights

Where there is likely to be a very large redistributive effect on income or related social welfare, the Green Book advises the application of distributional weights and the 'equivalised income' approach. This involves applying weightings to the cost-benefit analysis, in order to:

- adjust for the added value that low income individuals gain from public sector support compared to higher income individuals; and
- adjust for household composition.

In weighted analysis, monetised benefits for lower income households are given a higher social value than the equivalent benefits for higher income households.

The following pages explain how these calculations can be undertaken.

Applying distributional weightings

This page explains the process for applying weightings; a worked example is shown on the next page

- The first step is to estimate how average income for people in the affected area compares with median income at national level. If specific figures are not available, then data from the [ONS](#) can be used to make an estimate. This is summarised in the table below, and also available from the 'Income distribution HBAI summary' spreadsheet in the supporting data tables from the ONS link above.

Quintile Groups of all Households Ranked by Equivalised Disposable Income (Based on Weekly Income Before Housing Costs 2015/16)

	Bottom	2nd	3 rd (median)	4th	Top	Mean of all households
Final income (£)	244	363	481	638	946	593

- The ratio of median income to income in the affected area should then be raised to the power of 1.3. This is the Green Book's suggested value for the elasticity of marginal utility of income.
- Applying the calculation above results in a value that represents the distributional weighting. This can be applied to the welfare benefits that have been estimated.
- The weighted value of the welfare benefits can then be used within the BCR calculation.

Distributional weights - example

- A town has estimated that the present value of the monetised welfare benefits for one of its projects is £11m, and the present value of costs is £6m. **Without any distributional weighting, the Benefit/Cost Ratio is $11 / 6 = 1.83$.**
- It is estimated that median income at national level is 22% higher than average income in the town.
- Using the Green Book elasticity of marginal utility of income of 1.3, **the distributional weighting that can be applied is therefore $(1.22)^{1.3} = 1.29$**
- The present value of benefits with the distributional weighting applied is therefore $11 * 1.29 = 14.2$
- **Thus the BCR becomes $14.2 / 6 = 2.37$**

	Without distributional weighting	With distributional weighting
Present value of benefits (£m)	11.0	14.2
Present value of costs (£m)	6.0	6.0
Benefit/Cost Ratio	1.83	2.37

Equivalisation

As part of the calculation of average income, it may be necessary to apply 'equivalisation' depending on the differences in household composition between the areas being compared.

This adjusts income to account for household composition. For instance, an income of £300 a week is worth more to a household consisting of a couple than to a household of a couple with two children – the latter would need a higher income to enjoy the same living standard.

Households are assigned a score depending on their composition, using the values in the table on the right.

So a household with two adults would have a score of $0.67 + 0.33 = 1$, and income of £300 a week would be valued at $300 / 1 = £300$.

A household with two adults, one child aged 16 and one child aged 5 would have a score of $0.67 + 0.33 + 0.33 + 0.2 = 1.53$, and hence the equivalised income would be $£300 / 1.53 = £196$.

Score value	
First adult	0.67
Other adult	0.33
Children 14 yrs & over	0.33
Children under 14 yrs	0.2

Summary of key points

- As well as distributional weights, consider whether equivalisation is also appropriate based on relative household composition.
- Where distributional weights are applied, sensitivity tests are required to reflect the uncertainty around these – for instance, testing the impact of applying different weightings. This could include using ‘switching values’ – what would the weighting need to be in order for it to not be worth making the investment?
- Weighted estimates should be presented alongside unweighted estimates to demonstrate the impact of the weighting process.
- The Green Book provides guidance on calculating distributional weights and the equivalisation process – see p99 onwards of the [HM Treasury Green Book](#).

Reporting distributional impacts

For Towns Fund projects, the distributional appraisal can be reported on in the Business Case and summary document.

Business Case

Presentation of the results of the distributional analysis should be provided in the economic case (based on a proportionate approach).

Summary document

The distributional analysis can be summarised in the Business Case appraisal or cost-benefit projection section.

5. PLACE-BASED ASSESSMENT

Additional place-based analysis

Distributional analysis is linked closely to place based analysis. Where there is likely to be a difference in impacts across spatial areas or types of area, and data is available, this can be analysed and narrative provided.

The Green Book identifies that place based considerations may be required for:

- Inclusion of employment and productivity effects
- Other local benefits such as apprenticeships created, training courses supported, wellbeing etc.
- Alignment with local plans and strategies
- Interdependencies with other local or national interventions

Placed based analysis should account for additionality – i.e. deadweight, leakage, displacement and substitution. This is discussed in the TFDP's ['Economic Case: Best Practice Guidance'](#). Further guidance is also provided in the Green Book.

A key issue for place-based analysis is that a local BCR might include impacts on employment since these will be additional at local level, but the national BCR is unlikely to include these since the impact to the UK overall will be much lower.

6. FURTHER GUIDANCE

Guidance documents

The following guidance documents should be used to inform your assessment:

- HM Treasury - Green Book
 - Provides overarching guidance on distributional appraisal.
 - Provides guidance on application of income based distributional weights to CBA
 - Provides guidance on place based analysis
- Department for Transport - Transport Analysis Guidance Unit A4.2
 - Provides guidance on tabulating and mapping distributional effects of transport projects where spatial data is available.

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