



Department
for Transport

TAG UNIT A4.3

Place-Based Analysis

November 2022

Department for Transport

Transport Analysis Guidance (TAG)

<https://www.gov.uk/transport-analysis-guidance-tag>

This TAG Unit is guidance for the **APPRAISAL PRACTITIONER**

This TAG Unit is part of the family **A4 – SOCIAL AND DISTRIBUTIONAL IMPACTS**

Technical queries and comments on this TAG Unit should be referred to:

Transport Appraisal and Strategic Modelling (TASM) Division

Department for Transport
Zone 2/25 Great Minster House
33 Horseferry Road
London
SW1P 4DR
tasm@dft.gov.uk

Contents

1. Introduction	3
1.1 What is Place-Based Analysis?	3
1.2 Relationship with other guidance	3
1.3 Overall approach	4
1.4 Two-Way Road Effect	5
2. Objectives of conducting Place-Based Analysis	7
3. Determining the requirements for Place-Based Analysis	8
4. Employing Place-Based Analysis	11
4.1 Determining 'geographical areas in scope'	11
4.2 Considering Place-Based Analysis during the development of objectives	12
4.3 Considering place-based factors at the long-list stage	12
4.4 Undertaking differential spatial analysis at the shortlist stage	13
4.5 Place-based distributional impact analysis	26
5. Evaluation	29

1. Introduction

1.1 What is Place-Based Analysis?

- 1.1.1 Her Majesty's Treasury (HMT) updated the Green Book (GB) in November 2020 to reflect the findings and recommendations of the 2020 Green Book Review. As part of this, the revised Green Book includes a new annex on 'Place-Based Analysis' ([see Annex A2: Place Based Analysis pages 91-96 including boxes 24 and 25](#)). The annex aims to provide greater consistency in how scheme promoters assess the potential impact of options on different geographical areas and how these impacts are presented to decision-makers.
- 1.1.2 The GB defines Place-Based Analysis as follows: *'Place Based Analysis concerns appraisal applied to geographically defined areas within the UK. This definition includes a wide range of obvious categories such as villages, towns, cities, counties and regions and the home countries that make up the UK, it also includes other geographically based definitions such as "rural areas" or "areas of urban deprivation."*
- 1.1.3 This guidance explains how HMT's requirements around Place-Based Analysis should be interpreted in the economic dimension of transport business cases, and how it may be applied proportionately and innovatively to the scheme in hand. Place-Based Analysis is the process of spatially disaggregating the scheme's likely outcomes in terms of social welfare impacts and distributional impacts. This is to demonstrate how a scheme affects the geographical areas in scope. Place-Based Analysis should be considered at the long list stage of business case development and undertaken in the appraisal of the short list.
- 1.1.4 This guidance should be considered alongside other transport appraisal guidance relevant to developing a nuanced understanding of the impact on place in scheme appraisal, such as the TAG A2 Wider Economic Impact modules, TAG 4.2 Distributional Analysis, TAG M4 Uncertainty Toolkit, TAG M5.3 Supplementary Economic Modelling (SEM) and The Levelling-Up Toolkit. Place-Based Analysis is not restricted to appraisal impacts covered by TAG; scheme promoters have the flexibility to incorporate novel and innovative approaches, impacts, or both.

1.2 Relationship with other guidance

- 1.2.1 *Relationship with TAG Distributional Analysis.* Both the [TAG Distributional Impact Appraisal \(DIA\)](#) and Place-Based Analysis consider how impacts are dispersed. However, in the case of DIA, the dispersion is across population groups whereas Place-Based Analysis considers dispersion across spatial groups. They are different prisms through which to understand the potential

impacts of the proposal and should be viewed as complements rather than substitutes.

- 1.2.2 *Relationship with the Levelling-Up Toolkit.* The Levelling-up Toolkit is designed to help authors of strategic dimensions assess how a transport investment proposal fits with the objective of levelling up. The Toolkit provides a structure to the strategic dimension of the business case and presents indicators that can be used to evidence the levelling up case for a transport investment, including the socio-economic context and transport barriers in the local vicinity. Alternately Place-Based Analysis guidance is aimed at providing evidence in the economic dimension on how the estimated economic and distributional impacts of the scheme differ spatially. It can help to provide evidence of the performance of a proposal against strategic objectives.
- 1.2.3 *Relationship with the Economic Narrative.* The Economic Narrative (see TAG Unit 2.1 section 5) sets out a framework for the investigation and assessment of wider economic impacts which includes analysis around the socio-economic profile of the local population, transport constraints and evidence around additionality. There are natural synergies and overlaps between the evidence required for the Economic Narrative and Place-Based Analysis, Scheme promoters may choose to present the Economic Narrative and Place-Based Analysis as an integrated product.

1.3 Overall approach

- 1.3.1 Place-Based Analysis should be presented alongside the social welfare appraisal of the whole home country effects or the UK effects. This provides insights into the localised effect of transport investment on the geographical areas in scope, whilst also presenting the full range of benefits and disbenefits at national level.
- 1.3.2 Place-Based Analysis may consider:
- The outcomes of a transport scheme upon a place, where we assume fixed land use. This includes Level 1 Impacts and Level 2 Impacts as defined in TAG Unit A2.1.
 - The outcomes of a transport scheme upon a place taking full account of impacts under land use change (Level 3 impacts as defined in TAG unit A2.1 section 3.2.3).
 - Outcomes such as ‘gentrification effects’ that are further to TAG Level 3 Impacts. Scheme promoters are encouraged to consider innovative and novel approaches to identifying, quantifying, and monetising these impacts where proportionate and relevant to the business case. Evidence around these impacts should be transparently presented and justified in the economic dimension, with a balanced assessment of the strengths and weaknesses of this analysis provided. Scheme promoters would be expected to use robust valuation methods (Green Book Non-market valuation A1), ensuring additionality and double counting are considered.

- 1.3.3 The DfT Business Case guidance sets out the requirement for Place-Based Analysis at each stage of the business case development process. Qualitative Place-Based Analysis should be carried out at the Strategic Outline Business Case (SOBC) stage. There is no requirement for quantified analysis at this stage, although scheme promoters have the discretion to adopt a quantified approach if they judge it to be proportionate, or if the modelling done at SOBC stage can be easily spatially disaggregated. Place-Based Analysis should be completed at the OBC stage. It should be subject to further scrutiny at the Full Business Case (FBC) stage and updated with new evidence and analysis as required.
- 1.3.4 A range of evidence and economic theory can be used to estimate the full range of spatial impacts in Place-Based Analysis, including:
- Transport models;
 - Supplementary economic modelling (SEM) such as Land Use/Transport Interaction Models (LUTI) and Computable General Equilibrium (CGE) Modelling conducted to estimate Level 3 impacts;
 - The department's WITA tool for calculating wider economic impacts, based on input data from transport models where fixed land use is assumed, or in the case of land-use change, SEMs;
 - Empirical evidence from other contexts; and
 - Reasoning from economic theory regarding likely spatial effects.

1.4 Two-Way Road Effect

- 1.4.1 An important element of Place-Based Analysis is determining if the positive impacts generated by an option are in part or wholly because of activities being displaced from other parts of the UK. Transport interventions can often make the locations in the target area better off through increasing connectivity and making the areas more attractive locations for investment.
- 1.4.2 However, scheme promoters should note that improved accessibility between two regions may benefit prosperous areas rather than the poor areas targeted by the scheme (for example stronger external firms may penetrate the area with improved accessibility). This relative impact of investment is referred to as the two-way road effect (Venables et al., 2014). Place-Based Analysis can help to uncover and communicate these adverse local impacts.
- 1.4.3 Due to the potentially complex nature of displacement effects, the distribution and scale of these effects may not be immediately apparent. Therefore, scheme promoters may consider supplementary economic modelling where feasible and proportionate. This may include less resource intensive approaches such as additionality modelling, which downgrades gross economic impacts by an 'additional factor' based on contextual information and evaluation evidence.

Causal mechanisms for the Two-way Road effect

There are various reasons why improving connectivity between a less prosperous place ('Location A') and a more prosperous place ('Location B') could have adverse rather than beneficial effects on the former location.

- **Increased competition in product markets.** Enhancing transport infrastructure can open an area to external competition in product markets. This would increase supply and therefore reduce prices, leading to an increase in consumer surplus for consumers in that area. This may lead to a net benefit at the national level but there may be losses for some local businesses. For instance, consumers in Location A could use retail and leisure businesses in Location B instead (where these may be perceived higher quality and offering a greater range of choice).
- **Increasing competition in capital input markets.** Increasing accessibility between locations also promotes competition in capital input markets. This could reduce production costs and increase profitability as firms are able to benefit from a greater range of choice and quality of capital goods. However, if ancillary businesses are weaker in Location A, they could lose out to competitors in Location B, reducing the profitability of firms in location A. This may lead to agglomeration disbenefits as the level of business-to-business interaction in Location A could reduce, leading to less opportunity for beneficial productivity spill overs through 'learning' and 'sharing' (see TAG Unit A2.3).
- **Increased competition in labour markets.** Improving accessibility may lead to the labour catchment area for businesses being widened. This could improve labour market matching, allowing employers to access potential employees with more relevant skills more easily. However, enhancing transport infrastructure can affect labour market mobility in both directions. On the one hand, it could allow residents in Location B to access employment opportunities in Location A, improving the skills, productivity and output in the former location and contributing to regeneration. However, transport improvements can also make it easier for residents of Location A to work elsewhere. This could lead to brain drain, with the more talented individuals in Location A accessing employment opportunities outside their local area, thereby reducing output. Again, this could lead to agglomeration disbenefits through the 'matching' mechanism.
- **Increased competition in housing markets.** Finally, improving transport infrastructure can also enhance consumer choice for residents of an area in terms of housing. Again, this could lead to disbenefits for the less prosperous area. For instance, individuals in Location A may need to access facilities in this location including schools, hospitals and leisure facilities as well as maintaining social and family networks. Improving transport accessibility could encourage more individuals to move to Location B given that they are now more easily able to access key facilities and social networks from this new location. Given that housing in Location A and Location B are substitute goods, this would reduce the demand for housing in Location A, which all things being equal, could reduce land values in this location.

2. Objectives of conducting Place-Based Analysis

2.1.1 There are a number of key objectives for conducting Place-Based Analysis.

- a) **Understanding the extent to which a proposal achieves place-specific SMART objectives, promoting alignment between economic and strategic dimensions.** Place-Based Analysis undertaken in the economic dimension can provide useful evidence to support a scheme's strategic dimension and/or local or regional growth strategies and plan. Demonstrating a proposal's estimated contribution to a strategic aim will provide a stronger link between economic dimension analysis and the strategic objectives. This would be achieved through:
 - i. **Understanding the extent to which a proposal delivers social welfare impacts in an area or group(s) of areas.** This would complement the standard TAG aggregate country-level social cost benefit analysis.
 - ii. **Highlighting the distributional impacts in the selected geographical areas in scope.** This would complement the standard TAG Distributional Impact Analysis undertaken on the overall impact area of the scheme. An example of this could be where a scheme aims to support disadvantaged residents in a specific location, performing place-focused DI analysis on that location could highlight how it helps to achieve the scheme's SMART objectives.
- b) **Illustrating potential unintended consequences of a proposed investment for spatial areas, both positive and negative.** This could relate to areas which are not included as place-specific SMART objectives for the proposed intervention.
- c) Providing insight into the spatial impacts of a proposal can **inform scheme design and mitigations.** This could allow scheme promoters to modify the specification of proposals to ensure place-based economic development objectives are supported and that the risks of adverse impacts are mitigated.

3. Determining the requirements for Place-Based Analysis

- 3.1.1 Place-Based Analysis is recommended where either or both of the following criteria hold:
- *Criteria 1:* For proposals with geographically focused local or regional development objectives referenced in the strategic dimension of the scheme and/or in local or regional growth strategies and plans.
 - *Criteria 2:* Where proportionate, for proposals with substantial potential impacts either positive or negative on 'geographical areas in scope' (see below for definition). Scheme promoters should consider proportionality when balancing the cost and feasibility of analysis with its potential impact.
- 3.1.2 The extent to which impacts are 'substantial' should be justified by the scheme promoter in the economic dimension. It should take into account considerations such as the potential relative (e.g. compared to population size or GVA/GDP of the geographical areas in scope) and absolute magnitude of the differential impacts. This is both in terms of individual impacts considered and the cumulative effect across all relevant impacts.
- 3.1.3 The assessment of the requirement for Place-Based Analysis against Criteria 2 can be qualitative, quantitative or a combination. Quantitative analysis can include transport modelling and/or supplementary economic modelling along with other empirical evidence where available. Where analysis is largely qualitative, careful consideration should still be given to potential displacement effects (see 1.4.1).
- 3.1.4 Assessment against the criteria in paragraph 3.1.1 should be iterative, as business case development progresses it may be that the SMART objectives evolve, or new evidence comes to light. This may change the requirement for Place-Based Analysis as the business case develops.
- 3.1.5 Where a proposal meets either of the criteria in paragraph 3.1.1, proportionate Place-Based appraisal concerning the area(s) in question is required according to [TAG](#) and [HMT Green Book](#) guidance. This should be presented alongside national-level analysis. Due to proportionality considerations, larger and more expensive schemes may be expected to have more detailed analysis.
- 3.1.6 *Requirement for an initial strategic assessment.* Scheme promoters should conduct an initial strategic assessment, in advance of the development of the business case. The outcome of this assessment should feed into the development of the Appraisal Specification Report ([See TAG for the Technical Project Manager](#)).

- 3.1.7 *Addressing gaps in data, evidence, and modelling capability.* In some instances, it may be challenging for scheme promoters to conduct robust Place-Based Analysis due to insufficient modelling capability or a lack of evidence or data. In this situation, scheme promoters should produce an analytical specification plan to ensure the analysis can be provided in future business case iterations. Please refer to TAG Unit M1 to M5 on modelling. The department can provide more guidance in this area if required.
- 3.1.8 A fictitious case study is set out below to illustrate how Place-Based Analysis can be applied in practice. The case study provided is based on a hypothetical Rail scheme (preferred option), but the high-level principles also apply to other transport modes. This case study carries on as a supporting thread through other sections of the guidance.

Box 1: Case study: The Blue Line

Local Context and case for change

- Toddsville and Yeatown are both economically important large cities supporting around 20,000 businesses each and an economic output totalling nearly £35 billion a year combined. However, parts of the wider area in which these two cities are located suffer from significant economic and social deprivation.
- Toddsville and Yeatown have been identified as Functional Urban Regions (FURs) so are eligible to be assessed for agglomeration.
- With the distance between these two locations being 95 miles, the area is not well served by public transport with one bus running once an hour between Toddsville and Yeatown, taking over 3 hours due to poor road connectivity.
- To travel by train between the cities, a passenger must change twice. Journey times are slow in some instances with poor reliability, making rail travel an unviable option. Travel times range from 1.5 – 2 hours. Car journey time between the two cities is on average 1 hour and 45 minutes.
- The Blue line will connect Toddsville and Yeatown by rail with stops at the towns in between. It is designed to improve public transport links to jobs and services in each city centre including the intervening relatively deprived areas. This has been identified as the preferred option by the scheme promoter.

- 3.1.9 Scheme promoters developed a map (Local Authority District spatial level) to show the critical locations for the scheme, illustrating towns within the scheme's impact area and the location of key transport infrastructure. The objectives of the scheme are set out below.

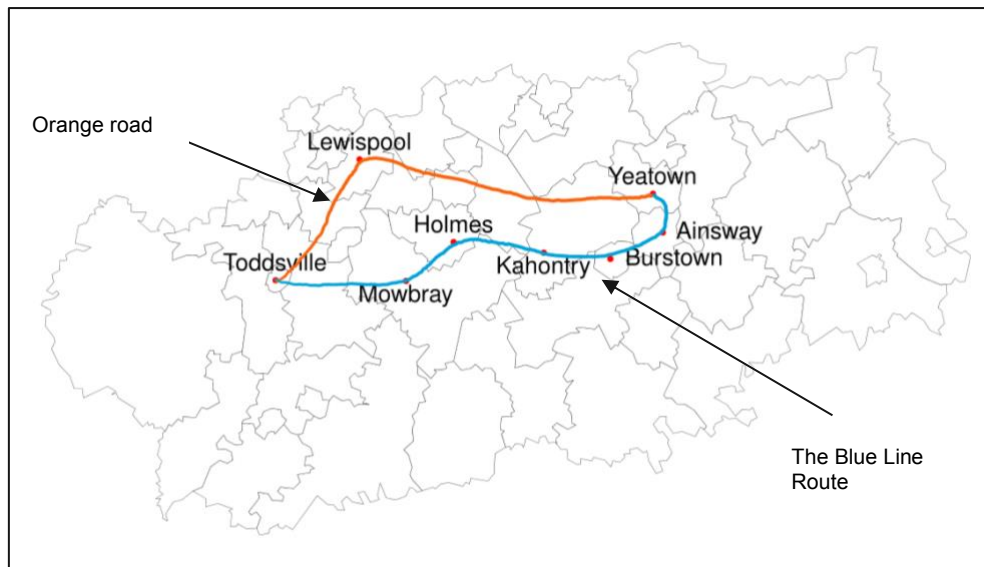


Figure 1: Location of Blue line and Key locations with the impact area of the scheme

Box 2: Scheme's strategic objectives¹ with a brief assessment of the preferred option

- **Objective 1. Shorten travel time between Toddsville and Yeatown by 2026** - the Blue line will provide a direct connection between Toddsville and Yeatown, which will shorten travel time between the two locations by c.30 mins.
- **Objective 2. Reduce congestion on the transport network** - through making other modes more attractive and inducing mode shift away from cars, the Blue line will also reduce congestion on the Orange road, which links Toddsville and Yeatown. Under the preferred option it is estimated to provide a 10-minute journey time saving (by road) on the orange road, which will be realised a few years after the rail line opens c.2030.
- **Objective 3. Increase reliability of transport links between Toddsville and Yeatown** - reducing the variation in journey time between these two locations will increase transport user benefits.
- **Objective 4. Promote regeneration opportunities for Mowbray, Holmes, Toddsville and Yeatown** - this includes delivering beneficial labour market and productivity outcomes and unlocking commercial and residential property development.

¹ Schemes may also have less economically focused place-based objectives than set out in this example (e.g. improving urban realm or quality of life).

4. Employing Place-Based Analysis

4.1 Determining 'geographical areas in scope'

- 4.1.1 Where Place-Based Analysis is required, scheme promoters should firstly determine a small number of 'geographical areas in scope' based on the following criteria:
- The strategic relevance of that area or place (e.g. where that area is referenced in the scheme's strategic objectives and in local/regional growth strategies and plans).
 - The potential magnitude of the positive or negative impacts on that area or place.
- 4.1.2 Scheme promoters should justify their approach in the economic dimension, including by providing a balanced and evidence-based justification of why certain areas have been included or excluded.
- 4.1.3 *Recommended level of spatial disaggregation.* Analysts should identify and justify the most suitable spatial disaggregation for the analysis. Presenting analysis at too fine a level of spatial detail may be misleading due to issues such as statistical confidence. On the other hand, presenting analysis that is too aggregate may conceal important strategic impacts, which can occur at a relatively localised level. *Box 3* provides further guidance on this process.
- 4.1.4 The list below, which is not exhaustive, details potential levels of spatial disaggregation to consider when developing PBA.
- Local Authority District (LAD)
 - Lower Layer Super Output Area (LSOAs)
 - Middle Layer Super Output Area (MSOAs)

Box 3: Determining the geographical areas in scope

- As a first step in conducting Place-Based Analysis, scheme promoters will carefully assess which locations should be defined as "geographical areas in scope".
- Toddsville, Yeatown, Mowbray and Holmes are referenced in the strategic objectives, therefore they are defined as being in scope.
- Kahontry, Burstown and Ainsway are not referenced in the strategic objectives. However, scheme promoter's initial analysis using TUBA outputs and DfT's WITA

software suggested they may experience strong positive user benefits and labour supply benefits, therefore are listed as geographical areas in scope.

- Lewispool is a nearby major city which currently experiences congestion from people travelling by car between Toddsville and Yeatown. The introduction of this rail line will encourage modal shift from car to rail, thus reducing congestion around Lewispool. Therefore, this is also defined as a geographical area in scope.
- Other places nearby such as Foxville and Stead are not considered to be geographical areas in scope. This is because the estimated magnitude of effects is small due to the existing strong connectivity in these areas.
- Scheme promoters must use appropriate rationale to justify the most appropriate level of spatial disaggregation. In this case the scheme promoter decided to undertake spatially differentiated analysis at local authority district (LAD) level. This was because the LAD spatial scale most closely corresponds to the size of the towns identified as geographical areas in scope, which means that they are strategically relevant whilst also allowing for a reasonable level of statistical confidence.

4.2 Considering Place-Based Analysis during the development of SMART objectives

- 4.2.1 Potential impacts on place should be considered at the outset of the business case development to inform the SMART objectives (see [Levelling Up toolkit](#)), as this will affect the options appraisal in the economic dimension. Scheme promoters should ensure that objective setting workshops are conducted in accordance with HM Treasury Green Book guidance with more advice on setting SMART objectives in Chapter 3 of The Green Book (paragraph 3.15 onwards).

4.3 Considering place-based factors at the long-list stage

- 4.3.1 In accordance with the HMT Green Book, consideration of place-based factors should take place when assessing the long-list. Where SMART objectives are place focused, options in the longlist that do not benefit the targeted place should be disregarded. This will help to ensure that all options in the shortlist meet SMART objectives. When developing the long list, careful consideration should be given to whether impacts are likely to be additional, taking into account the displacement, substitution, and leakage, as set out in the Green Book - see HMT Green Book section A2.9 (page 92).

Box 4: Considering place-based factors at the long-list stage

- Various public and private transport schemes were generated and assessed using HMT's Option Framework-Filter, including strategic alternatives to the Blue line rail route, such as direct bus route and a park and ride scheme, as well as various permutations of the proposed Blue line.
- Firstly, scheme promoters discarded options which do not meet the strategic objectives, as required in The Green Book 2022.
 - Park and Ride: This option would not meet the strategic objectives of regeneration because the scheme promoter finds little evidence to suggest park and rides boost economic activity (therefore contributing to the regeneration of the area).
 - Various alternative routes of the Blue line rail route were assessed but they were disregarded due to speed restrictions in Burstown having to be imposed due to noise concerns of the local area. Therefore, not meeting strategic objective number 1.
- Secondly, scheme promoters made a high-level quantitative assessment of place-based impacts, which led to further options being discarded due to unfavourable impacts on some geographical areas in scope.
 - Direct Bus Route: Regeneration opportunities of Holmes would be negatively affected.

4.4 Undertaking differential spatial analysis at the shortlist stage

- 4.4.1 Table 1 sets out impacts that could be disaggregated spatially to better understand the potential differential impact of the proposed transport options on places or areas. Which impacts to disaggregate spatially will depend on the relative magnitude and strategic relevance of the impacts. Consideration should also be given to the technical feasibility of disaggregating the chosen impacts and proportionality.
- 4.4.2 Where possible, analysts should exercise proportionality and make use of analysis already being undertaken as part of their business cases development. An example of this could be using key model outputs from TUBA (Transport User Benefit Appraisals) analysis and displaying them against different GIS (Geographic Information System) datasets. DIA may have the most synergies.
- 4.4.3 *Place-based narrative.* The presentation of spatially disaggregated impacts should be accompanied by a narrative which explores the expected distribution of these impacts. This should be based on economic theory and where possible empirical evidence. Key results should be communicated and interpreted in the narrative, with discrepancies and hypothesised results explained.

- 4.4.4 Analysts should consult the appropriate referenced guidance and follow the respective high-level methodologies to undertake differential spatial analysis. It is important that considerations and limitations associated with disaggregating data are clearly referenced alongside the analysis.
- 4.4.5 *Presenting key information using maps.* In accordance with the HMT Green Book Annex (A2), where data is disaggregated, this information should be presented as a map chart where possible. Software such as Geographical Information Systems (GIS) can be used to map data. Presenting Place-Based evidence in a salient and accessible format is important to maximise the impact of this analysis and effectively inform decision-makers about the Place-Based case for transport investments.

Table 1 - Recommended impacts to include in Place-Based Analysis where feasible, including suggested high-level methodology and analytical considerations and limitations

Impact	High level methodology for achieving a place-based disaggregation of impacts	Considerations and limitations when disaggregating impacts
<p>User benefits</p> <p>Relevant guidance:</p> <p>TAG Unit A1.3: User and Provider Impacts (section 3)</p> <p>TAG Unit A4.2: Distributional Impact Appraisal</p>	<p>TAG user benefits (TAG unit A1.3)</p> <ul style="list-style-type: none"> (i) Assess the feasibility of deriving area-level estimates based on available appraisal outputs and underlying model data (ii) Identify broad areas affected by the intervention (iii) Within the affected areas, obtain estimates of each impact by relevant geography, making sure to document methods and assumptions (iv) Map impacts onto GIS datasets. 	<p>Scoping feasibility is important.²</p> <p>Need to determine and clarify key underlying assumptions such as whether benefits should be attributed to trip origins or destinations.</p> <p>User benefits are usually calculated under the assumption of fixed land use which means there is a potential complicated relationship with spatial impact.</p> <p>Consideration should be given to whether the transport investment changes the cost of living in a place of interest. For example, new higher-income groups may move to access the transport. Land prices and rent then rise, causing low income groups to be priced out. This could create adverse social and distributional impacts that should be considered during appraisal.</p>
<p>Temporary construction disbenefits</p> <p>TAG Unit A1.3: User and Provider Impacts (section 3)</p>	<p>See TAG A1.3 guidance on methodology</p>	<p>There may be temporary construction disbenefits associated with the development of a particular scheme which has a transitory adverse impact on a place.</p>

² For example, mapping forecast time savings by (origin or destination) LAD to LSOA (or another geography) is unlikely to be as simple as apportioning estimates based on relative area sizes; in most cases, it will require further interrogation of transport model outputs.

Impact	High level methodology for achieving a place-based disaggregation of impacts	Considerations and limitations when disaggregating impacts
<p>Wider Economic Impacts (WEIs)</p> <p>Relevant guidance:</p> <p>TAG Unit A2-1: Wider Economic Impacts Appraisal</p> <p>TAG Unit A2-2: Induced Investment</p> <p>TAG Unit A2-3: Employment Effects</p> <p>TAG Unit A2-4: Productivity Impacts</p> <p>TAG Unit M5-3: Supplementary Economic Modelling</p>	<p>Appraisal and Place-Based Analysis may want to consider the WEIs listed in this table.</p> <p>WEIs may not be relevant for all schemes and must be justified in the economic narrative.</p> <p>The full methodology for each impact can be found in the relevant TAG unit.</p>	<p>General considerations</p> <p>Spatially disaggregated WEIs are usually reflective of the geographical structure of the underlying transport model, so simply breaking down WEIs by geography without carefully reviewing the assumptions underpinning the models could lead to inaccurate results.</p> <p>One approach would be to use SEMs to produce estimates which assume land use change. Please see TAG unit M5.3 for guidance on Supplementary Economic Modelling. An alternative approach is to use evidence-based scenarios as set out in TAG (M5.3).</p> <p>Dependent Development (TAG Unit A2-2) A Place-Based impact but difficult to account for displacement within the dependent development framework. Requires a strong supporting economic narrative.</p> <p>Labour Supply & Moves to More/Less Productive Jobs (TAG Unit A2-3) Obtainable from WITA or other WEIs software. However, due to methodological concerns around the need to ‘distribute’ the tax wedge to present differential spatial labour market impacts, then only GVA impacts should be presented. However, it should be clearly noted that GVA double counts the already measured user benefits.</p> <p>Static Clustering (TAG Unit A2-4) Obtainable from WITA or other WEIs software. Potentially the most suited to be included in Place-Based Analysis out of all the WEIs.</p>

		<p>Dynamic Clustering (TAG Unit A2-4) Suited for Place-Based Analysis but requires a Supplementary Economic Model (SEM) or a scenario-based approach.</p> <p>Scheme promoters should consider utilising the checklist in A2.4 section 6 when assessing agglomeration impacts.</p> <p>The following may also be relevant:</p> <p>Employment multipliers Apply multipliers from box 26 (Green book A2.11). Only relevant where an intervention creates jobs in 'tradable' sectors, i.e. those the output of which is sold mostly outside the local area</p>
--	--	---

Impact	High level methodology for achieving a place-based disaggregation of impacts	Considerations and limitations when disaggregating impacts
<p>Social impacts</p> <p>Relevant guidance:</p> <p>TAG Unit A4.1: Social Impact Appraisal</p> <p>TAG Unit A4.2: Distributional Impact Appraisal (relevant for spatially disaggregating impacts)</p> <p>COBALT user guidance (accidents)</p> <p>Green Book supplementary guidance: wellbeing (wellbeing impacts)</p>	<p>Accidents</p> <ul style="list-style-type: none"> (i) Take accident outputs by link and junction from COBALT (ii) Map onto a GIS dataset <p>Accessibility</p> <ul style="list-style-type: none"> (i) Develop and synthesis evidence on how the following elements vary spatially: <ul style="list-style-type: none"> • Journey times to key locations (including work, retail, leisure and community sites, schools, hospitals, and transport hubs) • Frequency and availability of transport links (e.g. frequency of services and daily start and finish times) • Travel horizons (some people are unwilling to travel long distances) • The extent to which transport hubs such as railway stations and bus interchanges are physically accessible (taking into account) (ii) Map into GIS dataset. For example, for journey times to key locations contour maps showing accessibility to the specified destinations within selected time periods appropriate to the intervention under consideration, such as off-peak, evening and/or weekends. Results could be split by appropriate catchment time bands, for example 10, 20, 30, 40, 50, 60 minutes. <p>Affordability</p> <ul style="list-style-type: none"> (i) Develop and synthesise evidence on how the cost of travel to users differs spatially. This includes: <ul style="list-style-type: none"> • Absolute costs • Costs relative to relative to income (before and after housing costs). 	<p>See TAG unit A4.1 and A4.2 for specific methodological considerations and limitations when disaggregating social impacts.</p> <p>The typical assumption that land use is fixed means that any use of current or recent observed data to inform comparisons of schemes (over a forecast period) is inherently prone to uncertainty and forecast error. The risk and uncertainty increases with the length of the forecast horizon used.</p>

	<p>Analysis of costs can be informed by transport modelling outputs around vehicle operating costs and user charges, as well as additional empirical evidence.</p> <ul style="list-style-type: none"> (ii) Map onto a GIS dataset. For instance, producing choropleth maps to show spatial variations in absolute and relative travel costs. <p>Severance and Security</p> <ul style="list-style-type: none"> (i) Conduct a qualitative assessment of how Severance and Security impacts vary spatially (see TAG Unit A4.2) (ii) Assign separate assessments categories against the TAG 7-point scale for each spatial area considered (iii) As such, they should be assessed qualitatively and presented in a map using the standard TAG scale. However, note that TAG states that Severance impacts should only be assigned a neutral or adverse (slight, moderate, or large) score (iv) Map impacts onto a GIS dataset e.g. a choropleth map showing how the TAG qualitative assessment score varies across spatial areas. <p>Wellbeing</p> <ul style="list-style-type: none"> (i) Please refer to Supplementary HMT guidance on wellbeing to estimate impacts. 	
--	--	--

Impact	High level methodology for achieving a place-based disaggregation of impacts	Considerations and limitations when disaggregating impacts
<p>Environmental impacts</p> <p>Relevant guidance:</p> <p>TAG Unit A3 Environmental Impacts</p> <p>TAG Unit A4.2: Distributional Impact Appraisal</p>	<p>Air quality and Noise (TAG unit A3).</p> <p>(i) Disaggregate impacts spatially -see TAG unit A4.2 for guidance on the methodological approach</p> <p>(ii) Map onto a GIS dataset to show how impacts vary spatially.</p> <p>Landscape, Townscape, Historic Environment, Biodiversity and Water Environment (TAG Unit A3)</p> <p>(i) Conduct a qualitative assessment of how impacts vary spatially (see TAG Unit A4.2)</p> <p>(ii) Assign separate assessment categories against the TAG 7-point scale for each spatial area considered</p> <p>(iii) Map impacts onto a GIS dataset e.g. a choropleth map showing how the TAG qualitative assessment score varies across spatial areas.</p>	<p>See TAG unit A3 and A4.2 for specific methodological considerations and limitations when disaggregating environmental impacts.</p> <p>Approach should reflect the scale of environmental analysis. Where impacts are highly localised, simple attribution methods may suffice; where impacts are widespread and complex, attribution may require additional tools such as GIS.</p>

4.4.6 *Approach to estimating Level 3 impacts* In line with TAG, Place-Based Analysis can utilise two potential approaches to understanding how potential Level 3 impacts may differ spatially. Scheme promoters can either:

- use a land-use model to forecast how the transport scheme would impact firms and households (please refer to TAG Unit M5.3 for more detail) or
- use robust and realistic scenarios about how firms and households are likely to respond to the transport improvement.

4.4.7 In most cases, especially for smaller schemes, a scenario-based approach would be a more proportionate approach to estimating Level 3 impacts than using Supplementary Economic Modelling.

4.4.8 Any scenarios should be based on careful consideration of economic theory and where possible empirical evidence. The treatment of displacement should be made clear, with consistency between the treatment of agglomeration and employment effects. A scenario-based approach would be especially suitable where significant impacts are likely to be localised and have limited second-order effects on the transport market. Please see TAG Units A2.3 and A2.4

- 4.4.9 *Carbon Impacts.* It is not expected that carbon impacts are disaggregated geographically, given they are global pollutants. However, scheme promoters may want to provide evidence on how schemes affect the local carbon footprints of geographical areas in scope. While this is not a 'welfare impact' it is useful in understanding which projects contribute towards reaching net zero in each part of the country. Scheme promoters may wish to use [online tools](#)³ to visualise the baseline footprints to consider schemes against it.

Box 5: Undertaking differential spatial analysis at the shortlist stage

- At the UK level, costs and benefits were estimated and resulted in a Low Value for Money Category.
- To help understand how estimated scheme impacts are distributed across the Yeatown/Toddsville region, scheme promoters developed and presented maps to present impacts more saliently to decision-makers.
- User benefits, wider economic impacts, and social impacts have been presented on maps as they reflect the strategic objectives of this scheme.
 - The Blue line connects Yeatown and Toddsville therefore providing **user benefits** through improved connectivity.
 - The proposed transport system can contribute to **static clustering, dynamic clustering and dependant development** which then can improve productivity.
 - **Social impacts** are relevant as the implementation of this train line is expected to contribute to fewer overall road accidents. Higher wellbeing (which is a non-TAG impact) in the targeted areas.
- When the benefits were disaggregated spatially, it displayed a clear alignment with the SMART strategic objectives and enhanced the evidence seen by the decision makers.
- The investment board took this Place-Based evidence into consideration alongside the UK-level Value for Money Category when assessing the case for the scheme.

³ PBCC is a free tool which estimates the per-person carbon footprint for every Lower Super Output Area (LSOA) in England.

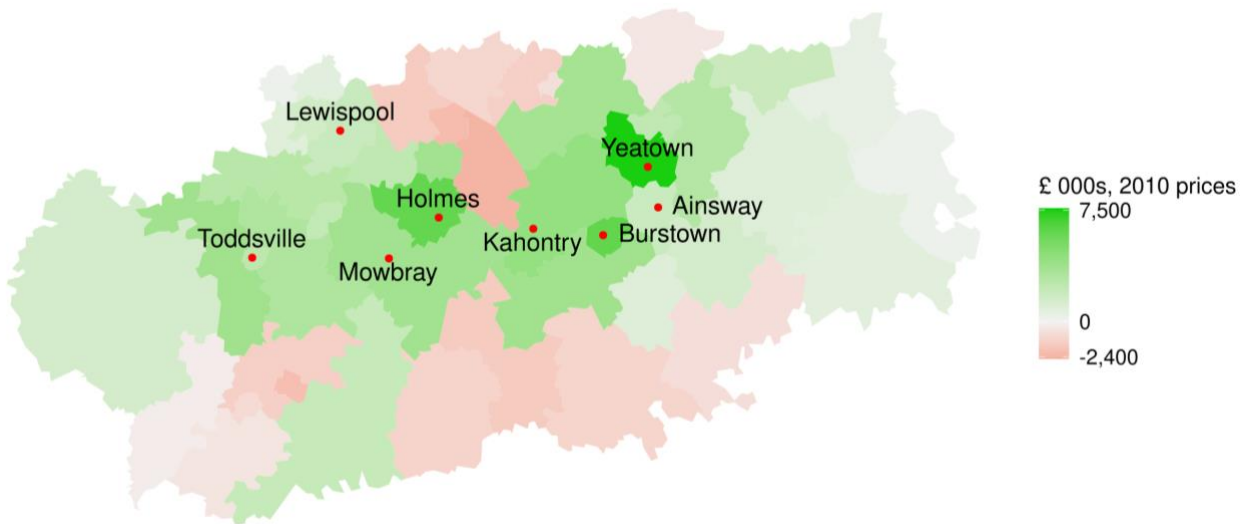


Figure 2: Spatial distribution of user benefits (£m) in the local vicinity of the Blue line

Figure 1 shows a map of the user benefits by area using data from TUBA. Yeatown is expected to experience the most user benefits in comparison to the other geographical areas in scope because its population has a large proportion of commuters. The map indicates that benefits may also be relatively larger in Holmes and Burstown. Some areas are estimated to experience negative impacts due to increased journey times when travelling from North to South due to severance effects associated with new train line.

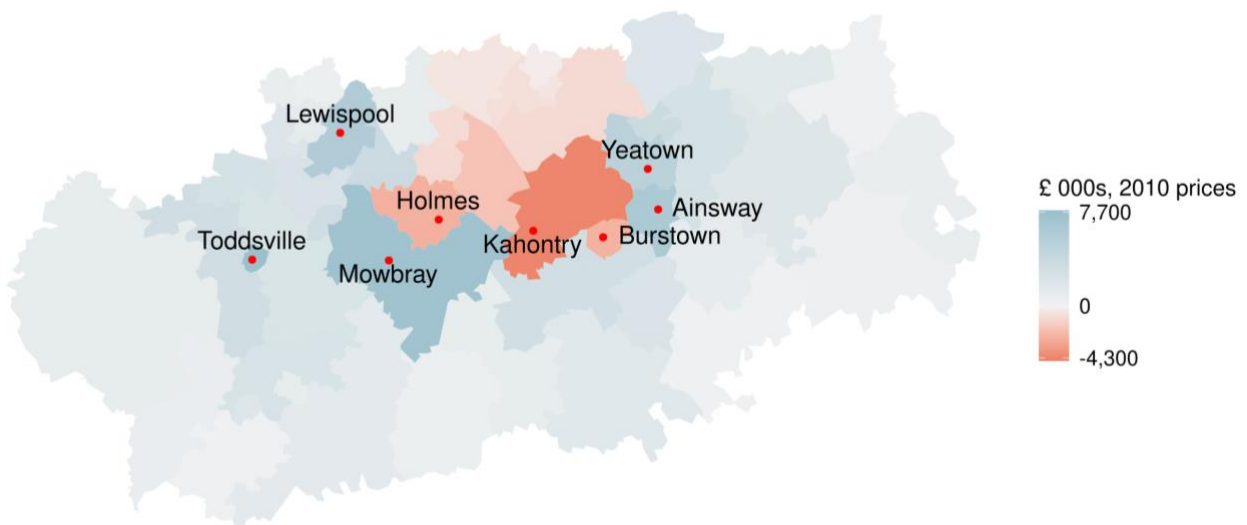


Figure 3: Spatial distribution of Wider Economic Impacts (£m) in the local vicinity of the Blue line

Figure 2 shows the total benefit from Wider Economic Impacts in each region. This includes static agglomeration, using estimates from WITA, as well as dynamic agglomeration and dependent development benefits, estimated using a supplementary economic model. The analysis estimates that the highest benefits are likely to be in Mowbray and Toddsville due to positive agglomeration effects combined with significant residential and commercial development. Kahontry and Holmes are estimated to experience net negative wider economic impacts due to deagglomeration.

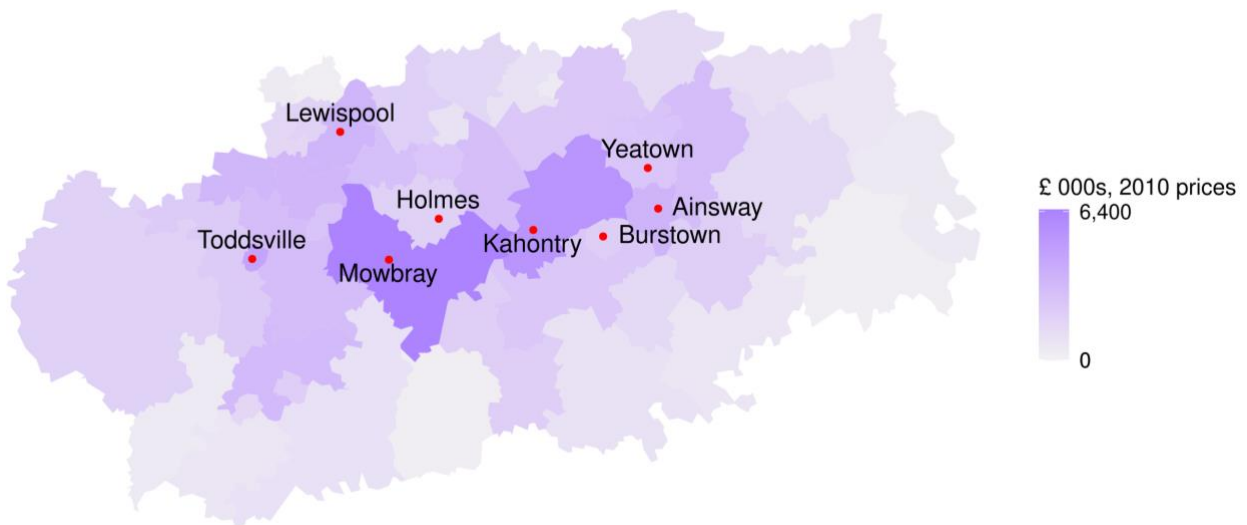


Figure 4: Spatial distribution of social impacts (£m) in the local vicinity of the Blue line

Figure 4 shows the aggregated social impact benefits of the local area. This is the value of a reduction in road accidents and higher wellbeing ([HMT Supplementary Wellbeing guidance](#)) which are both attributed to the scheme. Mowbray experiences the highest proportion of benefits.

- 4.4.10 *Reconciling impacts across geographical areas, including considering additionality.* Section A2.9 of the Green Book annex advises how place-based impacts should be adjusted for displacement, leakage, and substitution. It provides practical examples of how impacts can be reconciled across different levels of geography by taking account of the additionality considerations. Please refer to the HMT Green Book section A2.9 (page 92) for more guidance on the recommended methodology. The relationship between local and national level impacts, taking into account these additionality-related factors should be explained in a short summary in the economic dimension as recommended in the Green Book.
- 4.4.11 *Presenting information at other spatial scales.* Aside from presenting the analysis for the geographical areas in scope, it may also be informative to present analysis on other areas at different spatial scales to provide further insight into the scheme's contribution to strategic objectives. An example is provided below of how static agglomeration benefits are distributed within Yeatown.

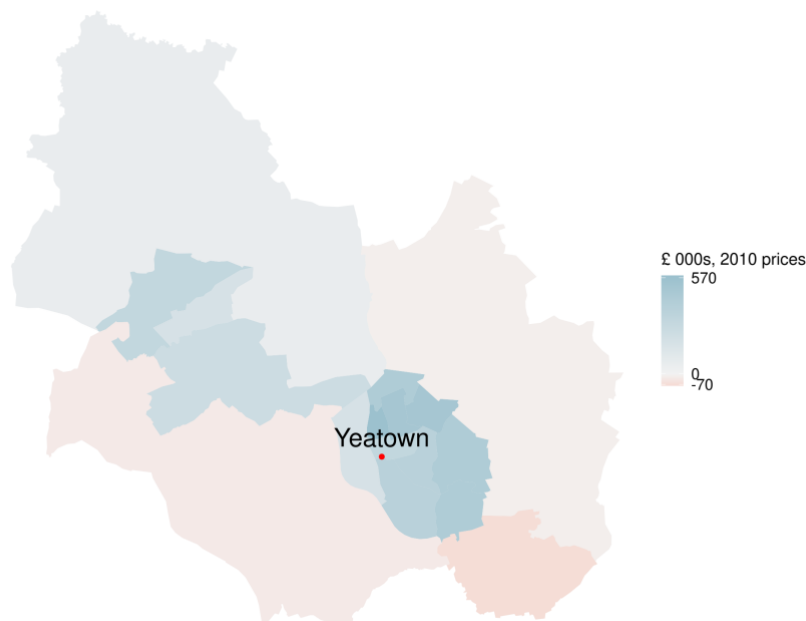


Figure 5: Spatial distribution of Wider Economic Impacts (£m) in Yeatown

Figure 4 illustrates aggregated Wider Economic Impacts in Yeatown at a finer spatial scale⁴ of disaggregation to inform a more granular analysis. The benefits are concentrated most strongly around the centre of Yeatown, with benefits also seen north west of the town centre. Analysis shows slight disbenefits to the outskirts of the town towards the south. The benefits towards the north west of Yeatown are of particular strategic relevance as the area is in the most deprived decile (according to the Index of Multiple Deprivation) which demonstrates the scheme supports government goals around addressing spatial inequality.

⁴ This analysis was undertaken at the ward level.

- 4.4.12 *Approach to reporting on large numbers of geographical areas.* Some transport schemes such as significant rail investments are likely to impact many geographical areas, either by their design and scheme objectives or unintended collateral effects. Scheme promoters should exercise proportionality when considering the breadth of information they provide to decision makers. They should also consider what information is most critical to the decision, for example displacement effects are likely to be of great interest.

4.5 Place-based distributional impact analysis

- 4.5.1 This section details how scheme promoters may want to undertake Distributional Impact Analysis on the geographical areas in scope.
- 4.5.2 *Distributional Impacts.* TAG Unit 4.2 states that considering distributional impacts in scheme appraisal is important for capturing the potential for differential impacts on certain vulnerable social groups. Place-Based Analysis is designed to complement distributional impact analysis through considering disadvantage through a spatial lens. It is not intended to be a substitute for it.
- 4.5.3 TAG Unit 4.2 provides guidance on how to capture distributional impacts in scheme appraisal as part of the economic dimension. Scheme promoters should adopt a robust and proportionate approach to understanding the differential effects of a proposal on income groups as recommended by the Green Book.

Social Groups Within the Scope of Distributional Impacts

- Individuals on low incomes
- Children below 16
- Young adults aged 16-25
- Older people aged 70+
- Disabled people
- Black and Minority Ethnic (BME) people
- Households without access to a car
- Households with dependent children

- 4.5.4 It may be useful to supplement the standard TAG distributional impact assessment with further evidence on the potential distributional impacts of the proposed investment on 'geographical areas in scope' as part of Place-Based Analysis. Continuing the example of the hypothetical rail scheme in the case study, it may be worthwhile summarising the distributional impacts for Mowbray in isolation as a separate exercise if, for instance, one of the strategic investments of the scheme is to assist disadvantaged individuals in this city. This would be in addition to including Mowbray in the wider summary. It is also important to carefully consider the extent to which adding further disaggregation to the analysis may result in a loss of analytical robustness.
- 4.5.5 In this case, tables 2, 4, 5, and 6 in TAG Unit 4.2 would be completed for the resident population and amenities in the geographical area in scope (Mowbray),

alongside considering the distributional impacts on the resident population and amenities in the overall impact area of the scheme.

- 4.5.6 Promoters are also encouraged to consider alternative novel approaches beyond TAG unit A4 to understand the distributional impacts as part of Place-Based Analysis. This can include assessing a scheme’s impact on groups that differ from the standard TAG socio-economic categories considered part of DI analysis and/or assessing non-TAG impacts such as wellbeing or loneliness (see box below).

<ul style="list-style-type: none"> • User benefits • Social/environmental impacts • Wider Economic Impacts • Wellbeing • Loneliness • Other non-TAG impacts 	<ul style="list-style-type: none"> • Occupation groups/industrial groups • Multiple Indices of Deprivation (e.g. deciles) • Acorn social groups • Employment status
---	---

- 4.5.7 It should be noted that transport investment in a particular location can lead to gentrification effects. Improved transport connectivity can lead to greater demand for the housing in that area, which in turn may push up house prices and rents. This can lead to a rise in the cost of living and other adverse distributional impacts, especially for private renters.

- 4.5.8 Scheme promoters may wish to provide further proportionate analysis on potential gentrification effects when considering distributional impacts. The ideal approach would be to consider these impacts in quantitative modelling; flexible and innovative approaches are encouraged in this area. Another approach could be to explore potential impacts in a narrative, informed by economic theory and empirical evidence where possible.

Box 6: Place-Based Distributional Impact Analysis

- The scheme promoters undertook a standard distributional impact appraisal for the impact area of the Blue line in accordance with TAG A4.2. Further to this, as part of complementary Place-Based Analysis, they also conducted a supplementary distributional impact assessment for the town of Mowbray in isolation as it has been targeted as a regeneration area in the strategic objectives.
- They found that accessibility benefits for no car households were higher in Mowbray when compared to the overall impact area of the Blue line.
- However, due to the placing of the station at Mowbray, severance effects for people with a disability was found to be higher than the rest of the impact area, moving from slight to severe. This is because of the unfortunate placing of a level crossing near a GP surgery.

- Providing a more focused distribution analysis for the town of Mowbray allows the scheme promoters to understand more about how vulnerable groups within this town would be impacted by the line and to mitigate these risks where possible.

5. Evaluation

- 5.1.1 This section sets out a checklist of points to consider when planning monitoring and evaluation of the place-based, spatial impacts of a scheme. General information about evaluation approaches can be found in the Magenta Book and Chapter 8 of the Green Book.
- 5.1.2 **Build from the business case.** Evaluation planning should build from Place-Based Analysis for the business case. In setting SMART objectives, consideration should be given to how evaluation may be used to measure the extent to which they are achieved (noting that this measurement may be challenging, as discussed below).
- 5.1.3 **Define geographical areas for expected outcomes and their measurement.** Building on the business case analysis, scheme promoters should identify where outcomes are expected to occur. Evaluation activity should be focused on where the greatest change is expected. In parallel, consideration should be given to possible disaggregation of relevant datasets as the definition of areas for analysis will need to reflect the constraints of available data.
- 5.1.4 **Determine how to measure the counterfactual.** In impact evaluation, to establish causality and attribution of impacts from a scheme, observed outcomes are compared with a counterfactual which is a credible assessment of what would have happened in the absence of the scheme. The simplest counterfactual is the situation before the scheme was launched; to capture this, data will need to be collected before the scheme launch. As before-after comparisons have limited value, especially where there are changing trends in outcomes of interest that are unrelated to the scheme, comparison areas should also be considered. A variety of comparisons may be possible including:
- Different locations in the same area (so long as it is credible to assume that these will have been unaffected by the scheme e.g. not affected through spill-overs or displacement);
 - Different locations which have matching characteristics and observable trends in outcomes of interest in the pre-intervention period but which do not have comparable schemes introduced;
 - Synthetic comparisons, which use statistical analysis to construct a weighted comparison group from a combination of different locations that are matched to the intervention area; and
 - Regional and national trends – these are the least robust forms of comparison on this list but are relatively easy to obtain and can provide useful contextual information.
- 5.1.5 **Think through timeframes.** Scheme promoters need to consider the timeframe in which place-based outcomes are expected to occur, noting that outcomes

associated with changes to land use, housing and the location of businesses and employment, for example, will take some time to materialise. Lags between potential outcomes occurring and when they can be captured in administrative data sources will need to be understood.

- 5.1.6 **Look for early evidence, where feasible.** Scheme promoters should try to identify early outcomes, or precursors of longer-term outcomes, which can be measured in a shorter time frame and can provide interim evidence for scheme stakeholders. Theory of change or logic mapping work can be helpful in capturing assumptions about the causal chain that leads from inputs to outputs and outcomes.
- 5.1.7 **Consider primary data collection needs.** While evaluation of transport schemes will often focus on administrative data and secondary data (e.g. surveys of residents and transport users conducted by others), scheme promoters should also consider whether primary data collection may be necessary, for example to help understand how the scheme is being experienced by stakeholders in particular social groups it is seeking to serve or businesses who will be expected to respond to the opportunities it provides. Well-targeted surveys or qualitative research with stakeholders can provide a richer picture of the effects of a scheme, helping to explain why measured changes in outcomes occur.