St Austell to A30 Link Road Full Business Case

Wider Economic Impacts Report

Cornwall Council / CORMAC

Project Number: 60571547-0127

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Quality information

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		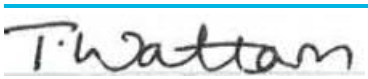
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Revision History

Revision	Revision date	Details	Authorised	Name	Position
1	30/09/19	Final	01/10/19	Thea Wattam	Associate Director
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1. Introduction

1.1 Purpose

The purpose of the EIR is to improve the transparency of economic impacts analysis within the Transport Business Case, in order that it can be objectively scrutinised.

TAG Unit A2.1 identifies that improving the transparency of economic impacts analysis is important for a number of reasons:

1. Consistency between the welfare and non-welfare metrics: The welfare and non-welfare metrics report the results of alternative approaches to valuing economic impacts. For any given scenario the welfare and non-welfare metrics should use a consistent set of assumptions and forecasts for the counterfactual; as well as the magnitude, nature and location of the economic impacts in response to a common shock, to ensure the Transport Business Case presents a consistent narrative.
2. Contextual Information: The counterfactual (do minimum), pattern of change in travel costs and economic impacts are all scheme specific. The specific scheme context should therefore determine the analytical approach adopted and the EIR should be set out why the analysis is relevant
3. Uncertainty Analysis: The results of all analysis are subject to varying degrees of uncertainty, as a result of the quality and availability of data, methods and unknown future economic shocks. The sensitivity of results to the underlying assumptions is key to understanding the analytical risks.
4. Quality of Analysis: The results of all analysis are subject to the quality of the methodologies used. Therefore the methodology should be transparently reported, such that its robustness and appropriateness can be examined and its inherent uncertainties can be distinguished from other potential weaknesses in the analysis.

In summary, the Economic Impacts Report should contain the technical analysis underlying the economic impacts such that stakeholders understand the derivation of the results and the key factors driving those results[1].

1.2 This report

Section 2 of this report summarises the findings of the economic narrative which describes the scope of analysis presented later in this report

Section 3 of this report describes the technical analysis that has been undertaken, including

- Quantification and Valuation Methodologies – a detailed description of the modelling and valuation methodologies used to analyse the economic impacts of the transport investment
- Results of the wider impacts analysis
- Key assumptions and parameters
- Discussion of analysis uncertainty
- Discussion of the welfare and non-welfare impacts for inclusion in the Business Case.

Appendices C-10.1 to C-10.4 include WebTAG recommended checklists of key points to use in setting up the analysis framework for assessing wider impacts and for checking back and identifying any potential issues that may affect the robustness of the analysis.

[1] WebTAG A2.1 6.1.1

2. Defining the Scope of Analysis - Economic Narrative

The purpose of the Economic Narrative is to articulate why the transport investment is needed to achieve any economic objectives and how it is expected to achieve these. Through this process, the narrative defines the scope of the analysis in terms of the impacts to consider and the mechanisms through which these are expected to occur.

The Economic Narrative sets out the context for the subsequent analytical methods required to capture and quantify the expected impacts.

In line with TAG Unit A2.1 5.1.1 the Economic Narrative is presented in the FBC report Economic Case (Appendix B-1)

In summary the Economic Narrative identifies the following economic impacts to be assessed at the analysis levels outlined within TAG Unit A2.1 Wider Impacts Overview Document:

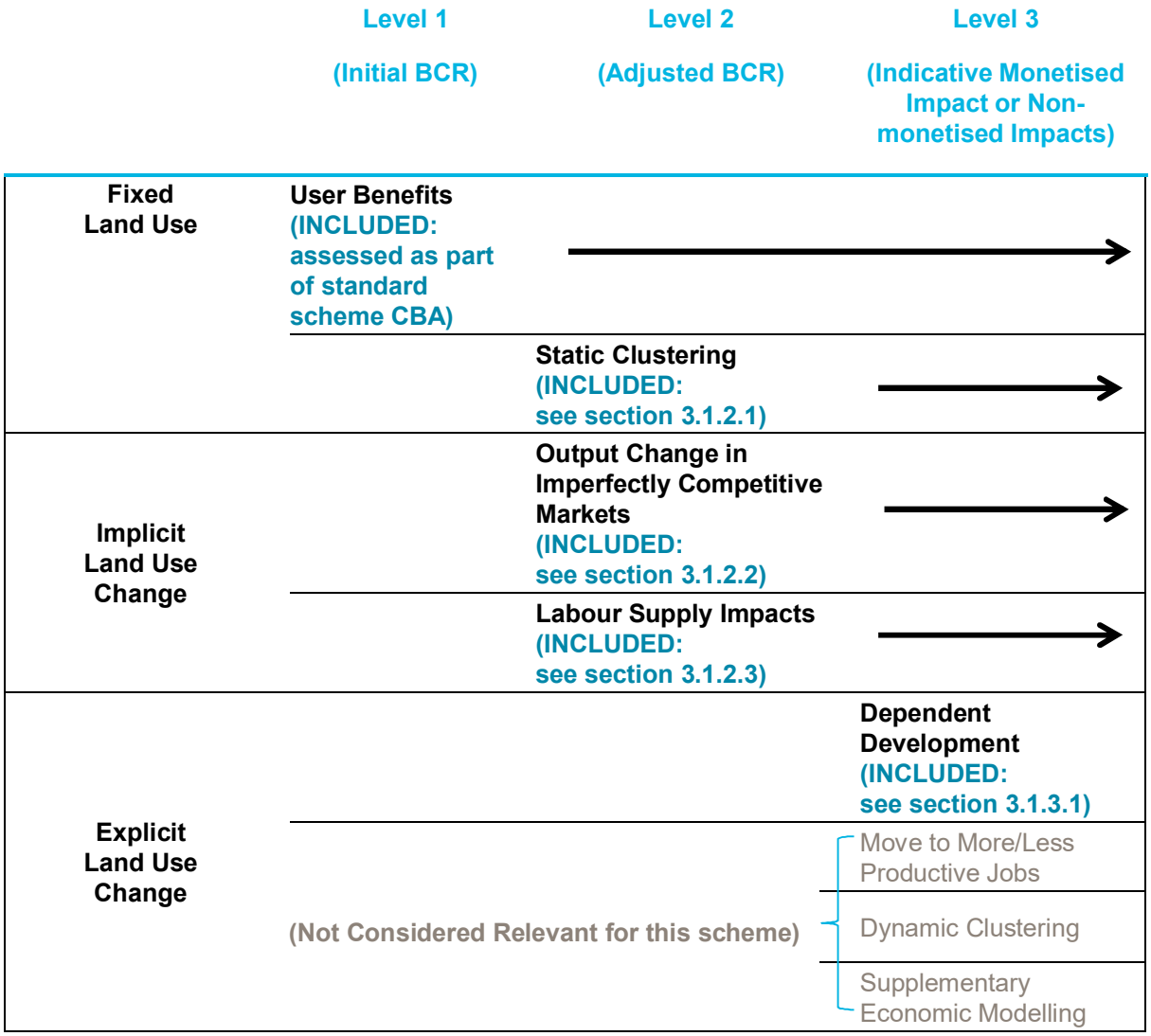
- Level 1: user benefit-based conventional impacts (Initial BCR): assessed using TUBA software
- Level 2: agglomeration improvements (proximity benefits) plus labour supply impacts (Adjusted BCR); and
- Level 3: dependent development impacts and adherence to additionality modelling guidance (Sensitivity Testing).

These are summarised in Figure 2-1 overleaf.

The Economic Narrative contains descriptions of why each type of economic impact method has been selected for the three 'levels of analysis':

- Level 1 Impacts (leading to Initial BCR):
  - These user-benefit-based 'conventional' impacts are derived from the traffic modelling work undertaken and cover the monetised journey time savings, accident reductions and other standard transport-related impacts typically associated with a scheme of this type
- Level 2 Impacts (leading to Adjusted BCR):
  - Agglomeration based productivity impacts are to be calculated as the scheme addresses a specific local business concern of poor accessibility to the A30 and the wider strategic road network
  - Output Change in Imperfectly Competitive Markets, associated with imperfect competition generated by poor accessibility of local businesses to the wider economy, typically representing 10% of business user benefits; and
  - Labour Supply impacts – as the Travel to Work survey undertaken in the St Austell area demonstrates significant amounts of commuting into and out of the area – this is to be expected given that employees living in the St Austell and China Clay Area need to access places of employment in Newquay and elsewhere (the survey also indicates that there are those who in-commute to St Austell
- Level 3 Impacts (not explicitly included in BCR, but informing the Value for Money judgement): these include
  - Dependent development impacts (the land value gain associated with significant new residential developments proposed in the corridor which cannot proceed without the scheme; and
  - Additionality assessment – an assessment of the scale of wider impacts associated with the new developments.

Figure 2-1 Economic Impacts to be Assessed (from full range proposed in TAG Unit A1)



Note: Only Wider Impacts highlighted in **bold** considered relevant to scheme in this business case

3. Technical Analysis

WebTAG identifies that key to improving the transparency of Transport Business Cases is the reporting of the analytical assumptions, justification and choice of methods in order that results can be objectively scrutinised. It goes on to state that transparent reporting improves the understanding decision makers have in the strengths and limitations of the analysis underpinning value for money assessments.

The following sections describe the approach to assessment, the resultant wider scheme impacts and discuss the uncertainty associated with these findings.

3.1 Quantification and Valuation Methodologies:

The assessment of the wider impacts of the St Austell to A30 link road at all levels is underpinned by with and without scheme model scenarios assessed in the transport model. The transport model development and assumptions are described in Appendices C-1, C-2, C-3 and C-4 of the business case documentation. The transport model has been developed in line with current WebTAG guidance and recommendations.

The following sections describe how wider impacts have been quantified using transport model data.

3.1.1 Level 1 Impacts – leading to initial BCR

User benefits have been assessed using DfT TUBA software following the standard approaches set out in TAG Unit A1.1 Cost Benefit Analysis, May-18. This analysis is reported in Appendix C-5 Economic Assessment Report

3.1.2 Level 2 Impacts – leading to adjusted BCR

3.1.2.1 Productivity Impacts – Static Agglomeration

Analysis has followed the approach and guidance contained in TAG Unit A2.4 Appraisal of Productivity Impacts.

The timescale of the appraisal work required assessment to commence prior to DfT WITA 2.0 software release. A spreadsheet model, developed for the OBC following methodology outlined in TAG Unit A2.4, has therefore been updated to reflect values in the TAG “forthcoming changes 2019: wider impacts dataset”.

The method to calculate these wider impacts was as follows:

- Process data outputs from the traffic model (‘Base Case’ and ‘Do Something’ generalised costs) so that the VISUM model zonal data is converted to Local Authority District (LAD) level – the wider impacts dataset is provided at LAD level (covering GDP per worker etc.) At this stage the model only covers a proportion of the trips made to/from and within Cornwall LAD. This is not an issue in the DM, where it is reasonable to assume that the trips included in the model are roughly indicative of trips across wider Cornwall. However, an issue arises in the DS where the reduction in average travel times across trips within the model over estimates the reduction in average travel times across all trips in Cornwall; this is due to the focus of the model on trips impacted by the new link road. It has therefore been necessary to make the following adjustments and assumptions when determining average travel times for LAD to LAD movements in the DM and DS scenarios from model data:
  - In the DM, costs from each modelled zone were used.
  - In the DS, only a proportion of the cost change between the DM and the DS was applied. For Cornwall-based zones, this proportion was equal to the fraction of the Cornwall population living in the study area. For non-Cornwall-based zones, this proportion was set to zero; i.e. the DM values were used.
- Travel times and distances were converted into generalised cost of travel following the approach outlined in TAG Unit A1.3 User and Provider Impacts.

- An Excel-based Wider Impacts Model was developed that uses traffic model outputs and WebTAG-based calculation of productivity impacts (following the formulae set out in TAG Unit A2.4);
- The calculations were undertaken across the four different industrial sectors in the wider impacts dataset (Construction, Consumer Services, Manufacturing and Producer Services);
- The agglomeration improvement calculations were undertaken for the Preferred Option with Core growth being the 'central case' scenario tested.
- Similarly to the conventional benefits based on the TUBA outputs, the agglomeration improvement benefits were summed over 60 years subject to 3.5% discounting in the first 30 years and 3.0% thereafter.

The main transport model study area covers St Austell and includes the towns of Roche and Bugle to the north, Lostwithiel and Fowey to the east, Mevagissey to the south, and St Stephens and St Dennis to the west. The fully modelled area is shown in Figure 3-1. The remainder of Cornwall has been modelled in varying levels of detail. This area is not as detailed as the main study area but allows for the control of traffic routes into Cornwall. The wider model area includes the rest of the UK. Outside Devon and Cornwall, the zones become much larger, with Wales and most of England amalgamated into one zone.

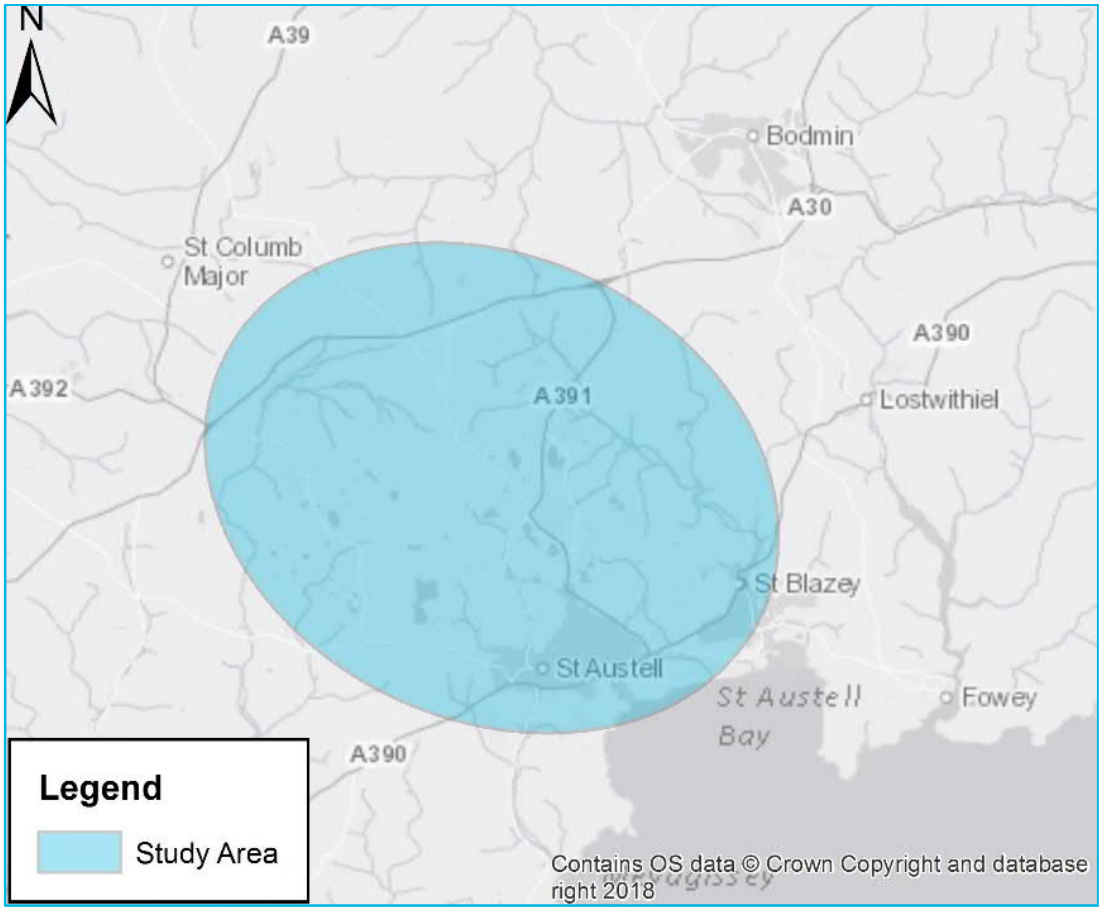


Figure 3-1: St Austell model study area

In line with TAG guidance agglomeration impacts across the whole of Great Britain have been assessed. Whilst not representing demand for travel across the whole of Great Britain, the transport model does contain a representative buffer network based on observed fixed speeds which has allowed the travel times for all movements across the full national matrix to be extracted. This has meant that effective density calculations have taken into account proximity to all employees in the country.

This is a change to the methodology adopted at the OBC stage where the agglomeration-based Wider Impacts were calculated on a much more localised basis with the agglomeration impacts restricted to those within the Cornwall Local Authority District.

The transport model provides forecasts for two future years (scheme opening year of 2022 and forecast year of 2037). The data derived from the transport model has been linearly interpolated between 2022 and 2037, and extrapolated at 2037 level for all years beyond 2037, to provide annual data for the 60yr appraisal period required by WebTAG.

TAG Unit A2.4 provides a checklist of key points to use in setting up the analysis framework for assessing productivity and for checking back and identifying any potential issues that may affect the robustness of the analysis. This checklist is reproduced in Annex C-10.1 with commentary of the checks undertaken during the technical analysis.

3.1.2.2 Induced Investment – Output Change in Imperfectly Competitive Markets

Welfare benefits associated with 'Output Change in Imperfectly Competitive Markets' have also been assessed. Analysis has followed the approach and guidance contained in TAG Unit A2.2 Induced Investment. In line with current guidance, these are calculated by applying 10% uplift to business user benefits derived from the Level 1 Cost Benefit Analysis.

TAG Unit A2.2 provides a checklist of the key evidence requirements when quantifying and valuing wider economic impacts from output change in imperfectly competitive markets. This checklist is reproduced in Annex C-10.2 with commentary of the checks undertaken during the technical analysis.

3.1.2.3 Labour Supply Impacts

Analysis has followed the approach and guidance contained in TAG Unit A2.3 Employment Effects

The timescale of the appraisal work required assessment to commence prior to DfT WITA 2.0 software release. The spreadsheet model (originally developed for the OBC assessment of agglomeration impacts and subsequently updates for the FBC assessment of productivity impacts) has therefore been extended to include calculation of Labour supply impacts. The methodology reflects guidance in TAG Unit A2.3 and parameters reflect the values in the TAG Forthcoming changes 2019: wider impacts dataset.

In summary the method to calculate these wider impacts was as follows:

- The same generalised cost data at LAD level that was used to assess productivity benefits has been used for assessment of employment impacts (described on page 8)
- The Excel-based Wider Impacts Model was extended so that the traffic model outputs could be used in the WebTAG-based calculation of employment Impacts (following the formulae set out in TAG Unit A2.3):
  - Generalised travel costs and commuting costs for journeys between the relevant areas for different modes are estimated
  - The total labour supply impact (change in number of people employed) across the areas where costs of travel are expected to change as a result of the transport scheme is estimated. The estimation of a positive labour supply impact anticipates the expected increase in jobs from people entering work who would otherwise be inactive due to high commuting costs
  - GDP impacts of the labour supply impacts resulting from a scheme are calculated.
  - Welfare impacts are calculated as the tax revenues resulting from labour supply impacts and reflects both the increase in tax revenue (income tax, national insurance contributions and corporation tax) and the reduction in out of work subsidies.
- The employment effects calculations were undertaken for the Preferred Option with Core growth being the 'central case' scenario tested; and
- Similar to the conventional benefits based on the TUBA outputs, the agglomeration improvement benefits were summed over 60 years subject to 3.5% discounting in the first 30 years and 3.0% thereafter.

TAG Unit A2.3 provides a checklist of the key evidence requirements when appraising the move to more/less productive jobs. This checklist is reproduced in Annex C-10.3 with commentary of the checks undertaken during the technical analysis.

3.1.3 Level 3 Impacts

3.1.3.1 Dependent Development

Extensive work was undertaken during the Outline Business Case (OBC) stage of the project to assess dependent development impacts of the St Austell to A30 Link road. As identified in the economic narrative a key wider objective of the new link road is to facilitate access to and from proposed new residential and employment sites within the corridor.

Also as concluded in the economic narrative the dependent development assessment has not been updated as part of the full business case as it was identified as proportionate to retain the existing assessment for two key reasons:

- The scheme route and design is largely unchanged since OBC stage meaning assessments of development dependence still holds
- The monetary values of impacts from the dependent development assessment are not included in the adjusted BCR (in-line with TAG guidance) and therefore there is a reduced need to ensure consistency in calculation as values are informing a qualitative judgement.

The approach that was adopted to assess dependent development impacts during the OBC stage of the scheme is summarised below.

Dependent development impacts were based on TAG Unit A2.3 guidance in force at the time. Analysis focused on residential land value gain. The approach adopted was based on the first of the two scenarios described in Unit A2.3: It is possible that some transport schemes could 'unlock' housing development; that is, the housing development directly depends upon implementing the proposed transport investment. This might be due either to 1) a lack of access to the planned area of development, or 2) to planning constraints arising from an expectation that the surrounding transport network would be rendered over capacity during peak periods were the new development to proceed.

The impact based on lack of access is applicable here as this is one of the key factors holding back development in the St Austell area (as demonstrated in the Strategic Case and the feedback gained from the stakeholder consultation).

Land Value Uplift

The potential dependent development gains from residential land value uplift were based on analysis using DfT's Valuing Housing Impacts workbook and took account of the following:

- Three key housing sites that are highly unlikely to go ahead without the better access provided by the Link Road were identified:
  - ECO M2 site near Par Docks;
  - STA M1 site at Pentewan Road; and
  - STA M2 site at Edgecumbe;
- These sites have been identified within a development plan and could go ahead if the Link Road is built (or are conditional on the Link Road proceeding); and
- All three sites are large with respective sizes of 4.7, 0.94 and 0.24 hectares.

The land values were based on locally derived data for agricultural and residential land with the externality land values (perpetuity) based on the data in the DfT dataset. There is a marked differential between the value of undeveloped agricultural land in the South West (as typically seen in the area around St Austell) and the values associated with residential land use in Cornwall.

It was noted both during OBC stage and now that the land value uplift of dependent development includes any impact which are capitalised into land values, such that double-counting of wider economic impacts can arise. For this reason, dependent development and other impacts such as agglomeration cannot be (and have not been) added together.

Additionality of Development Impacts on the Wider Economy

In addition to the land value uplift of dependent developments an additionality assessment of the other impacts that the unlocked development could have on the wider economy was considered based on HCA's guidance at the time.

Additionality refers to the extent to which the wider economic impacts will be retained within the study area and are not subject to 'leakage' and 'displacement' to / from other areas. Additionality modelling was considered relevant as it addresses the following:

- Leakage: e.g. what proportion of wider economic impacts will benefit those outside the study area?
- Displacement: e.g. the proportion of impacts accounted for by reduced benefits / impacts elsewhere;
- Substitution: e.g. instances where a firm "substitutes" one activity for a similar one (one type of worker could be substituted for another type of worker etc.); and
- Economic multiplier effects: e.g. further economic impacts from knock-on effects in the local economy (such as impacts on supply industries and the impact of increased spending by new employees).

As reported in the strategic case there is considerable long-term economic potential in the study area and this includes the impacts of developments not likely to reach their full potential if the Link Road is not built. These impacts cover a range of metrics, including numbers of jobs (both construction and 'operational'), the GVA generated by the additional jobs, additional Council Taxation receipts and additional Business Rate income.

Following a review of potential development sites a total of 30 sites were identified in the Local Plan and other development plans – these included a mixture of commercial sites and business parks, new residential developments and mixed-use sites.

Each site has its own 'development schedule' in terms of size and build-out horizon. The assumption made for this appraisal was that full development of each site would take place by 2037 (the modelled forecast year) with the Link Road implemented.

To assess the extent of additionality to the study area, the following was assumed:

- A reference case was defined – this is the likeliest outcome over time if no intervention takes place (e.g. no Link Road). For the Reference Case, of those sites already given planning permission or likely to go ahead, the assumption was made that they would only reach half their proposed build-out if the Link Road is not built. Of the 30 sites, there was uncertainty as to whether 8 of these will go ahead (and are therefore likely to need the Link Road to facilitate them) – these are assumed not to go ahead in the Reference Case;
- Leakage levels will be negligible – as the developments will be implemented solely within the study area (a relatively isolated, stand-alone community and surrounding area), there is very little likelihood of leakage of economic impacts to other locations and communities. Assumed leakage is therefore zero;
- Displacement will be negligible – the developments have been put forward for this area specifically and have been included in local plans for a considerable period of time – the likelihood that these have been displaced from other parts of Cornwall (or elsewhere) is thus very small and is considered to be zero here;

TAG Unit A2.2 provides a checklist of the key evidence requirements when quantifying and valuing site-specific dependent developments. . This checklist is reproduced in Annex C-10.4 with commentary of the checks undertaken during the technical analysis.

3.2 Results

As outlined in TAG Unit A2.1 section 2.2, the core approach to appraise economic impacts is welfare analysis and the core scenario should be estimated using the methodologies set out in TAG units A1 and A2. The sections below summarise the results of welfare analysis for each of the wider impacts.

3.2.1 Level 1 Results – Initial BCR

Level 1 results have been derived using standard TUBA based cost benefit analysis (CBA) approach outlined in TAG Unit A1 cost-benefit analysis and documented in Appendix C-5 Economic Assessment Report.

Table 3.1 summarises the initial PVB and PVC which leads to the initial BCR of 1.61 for the core scenario, with slightly higher initial BCR of 1.62 in the low growth scenario, and slightly lower initial BCR of 1.57 in the high growth scenario.

Table 3.1 Level 1 Benefits (£000) of scheme

Impact	Discounted Costs (£m, 2010 prices)		
	Low Growth	Core	High Growth
TOTAL INITIAL PVB	£100.45	£99.41	£97.38
PVC	£61.85	£61.85	£61.85
Initial BCR	**1.62**	**1.61**	**1.57**

3.2.2 Level 2 Results

Following from the justification outlined in the economic narrative the level 2 analysis of wider impacts has considered and monetised the following wider impacts:

- Productivity Impacts – Static Agglomeration
- Induced investment – Output Change in Imperfectly Competitive Markets
- Labour Supply Impacts

Welfare and non-welfare impacts of the St Austell to A30 link road are described below.

3.2.2.1 Welfare Impacts– Core Scenario – Adjusted BCR

In line with TAG guidance benefits have been presented for a 60 year appraisal period in 2010 prices, discounted to 2010.

The contribution to PVB from these impacts is shown in Table 3.2 below:

Table 3.2 Level 2 Wider Impact Benefits (£000) of scheme – Core Scenario

Impact	Discounted PVB (£'000, 2010 prices)
Static Agglomeration	£25,220
Output change in imperfectly competitive markets	£3,181
Labour Supply Impacts	£147
TOTAL	**£28,548**

The results show that the scheme provides significant additional wider economic benefits and that these are primarily due to agglomeration-based productivity improvements.

The analysis shows limited labour supply welfare impacts (see section 3.2.2.2 for discussion)

Based on the wider impacts the adjusted BCR for the scheme is set out in Table 3.3 below.

Table 3.3 Analysis of Monetised Costs and Benefits (£000) of scheme (Adjusted BCR)

	£'000, 2010 prices
PVB from Initial BCR	£99,415
Level 2 Wider Impact Benefits	£28,548
Reliability Benefits	£0
OVERALL PVB (ADJUSTED)	**£127,963**
Present Value of Costs (PVC)	£61,849
Adjusted Benefit to Cost Ratio (BCR)	**2.07**

With inclusion of the wider economic benefits the scheme produces an adjusted BCR equal to 2.07.

3.2.2.2 Non-Welfare Impacts – Core Scenario

Table 3.4 summarises the non-welfare labour supply impacts of the scheme. Non-welfare impacts are not included in the economic case (nor contribute to the adjusted BCR), but are relevant for supporting the strategic case

Table 3.4 Non-Welfare Labour Supply Impacts

	2022	2037
Additional Employment	1.3	8.9
Additional GDP (£ '000, in 2010 prices)	£17.1	£22.3

The analysis shows very limited labour supply impacts with only a small change in number of employees. This is in part due to consideration of generalised cost impacts and subsequent effect on employment at local authority area in TAG guidance. This means that labour supply analysis has been undertaken for whole of Cornwall as a single area, with resultant limited change in average commuting costs) which may be diluting the impacts of the more significant time savings for commuters in the scheme corridor where the Economic Narrative has identified poor accessibility as a key barrier to employment.

3.2.2.3 High and Low Growth Scenarios

High and low growth scenarios have been developed as part of the forecasting work. Assignment model results are available for both scenarios for Do Minimum and Do Something networks. These results have been used to assess the variation in scheme wider economic impacts under alternative future demand scenarios.

The contribution to PVB for the high growth scenario is shown in Table 3.5 below, whilst the contribution to PVB for the low growth scenario is shown in Table 3.6 below:

Table 3.5 Level 2 Wider Impact Benefits (£000) of scheme – High Growth Scenario

Impact	Discounted PVB (£'000, 2010 prices)	Change from Core Scenario
Static Agglomeration	£20,445	-19%
Output change in imperfectly competitive markets	£3,461	+9%
Labour Supply Impacts	£158	+7%
TOTAL	**£24,064**	**-16%**

Table 3.6 Level 2 Wider Impact Benefits (£000) of scheme – Low Growth Scenario

Impact	Discounted PVB (£'000, 2010 prices)	Change from Core Scenario
Static Agglomeration	£22,488	-11%
Output change in imperfectly competitive markets	£3,356	+5%
Labour Supply Impacts	£157	+7%
TOTAL	**£26,001**	**-9%**

The results show that the scheme provides additional wider economic benefits in all scenarios and that these are primarily due to agglomeration-based productivity improvements. Figure 3-2 summarises the productivity benefits generated by the scheme in each growth scenario.

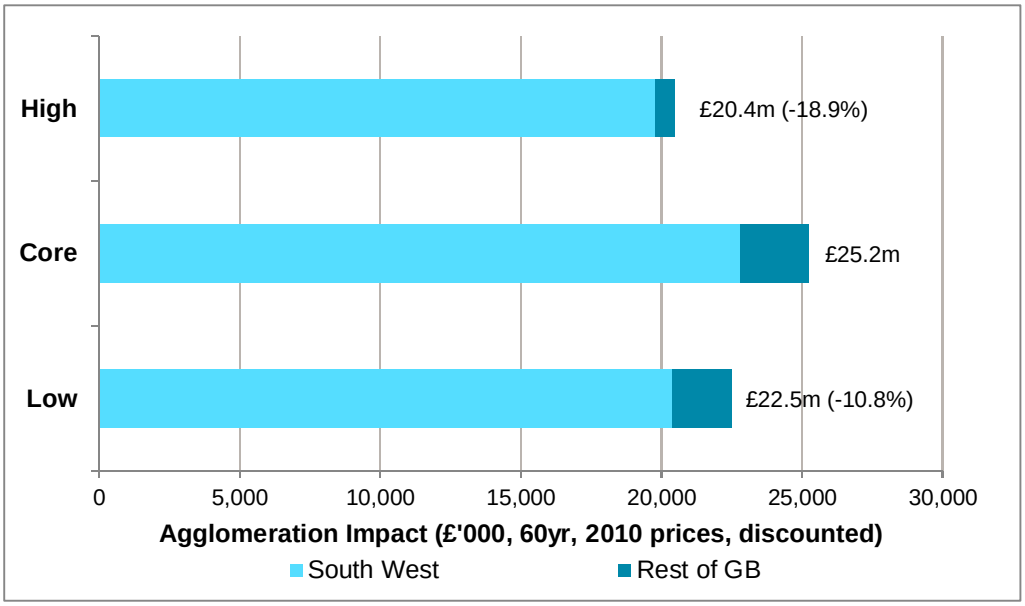


Figure 3-2 Total Agglomeration-based Productivity Benefit under Alternate Growth Scenarios

Under higher and lower growth scenarios productivity benefits are reduced. The cause of this pattern can be seen in Figure 3-3 which shows the undiscounted benefits in the individual assignment model years (2022 and 2037)

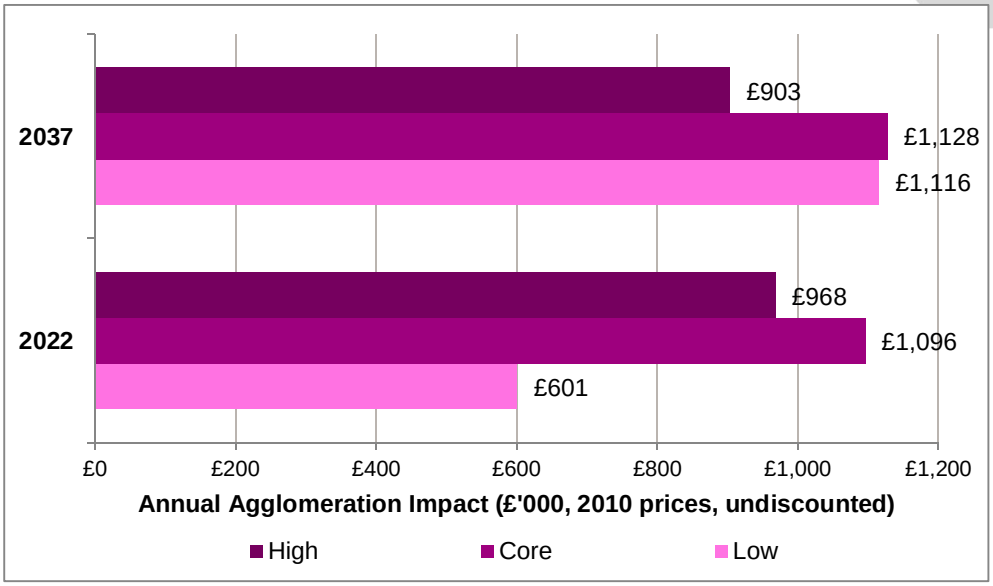


Figure 3-3 Annual Agglomeration-based Productivity Benefits under Alternate Growth Scenarios

Under the low growth scenario the agglomeration impact in 2022 is significantly below the core scenario. This can be attributed to lower levels of congestion in the do minimum scenario meaning the scheme provides lower levels of congestion relief and subsequently lower levels of agglomeration impact. By 2037 the agglomeration impacts in the low scenario have risen to around the levels seen in the core scenario. This is likely to be because demand in the low scenario do minimum has reached levels where congestion is significant enough to result in levels of congestion relief (and subsequently levels of agglomeration impact) similar to the core scenario. Even though impacts in later years are similar to core scenario total benefits across 60 years in the low scenario are 10.8% lower than in the core scenario due to smaller impact in earlier years.

Under the high growth scenario the agglomeration impact in both 2022 and 2037 is lower than in the core scenario. This can be attributed to higher levels of congestion in the high growth do something reducing the performance of the scheme (in terms of congestion relief) and subsequently reducing agglomeration impacts relative to the core scenario. As a result across 60 years the total benefits in the high scenario are 18.9% lower than in the core scenario due to smaller impact in all years.

Based on the wider impacts the adjusted BCR for the scheme under high and low growth scenarios is set out in Table 3.7 below.

Table 3.7 Analysis of Monetised Costs and Benefits (£000) of scheme (Adjusted BCR) – Alternate Growth Scenarios

	£'000, 2010 prices		
	Low Growth	**Core Growth**	**High Growth**
PVB from Initial BCR	£100,452	£99,415	£97,375
Level 2 Wider Impact Benefits	£26,001	£28,548	£24,064
Reliability Benefits	£0	£0	£0
OVERALL PVB (ADJUSTED)	**£126,454**	**£127,963**	**£121,439**
Present Value of Costs (PVC)	£61,849	£61,849	£61,849
Adjusted Benefit to Cost Ratio (BCR)	**2.04**	**2.07**	**1.96**

Under alternate growth scenarios the adjusted BCR remains stable at around 2, representing high value for money.

3.2.3 Level 3 Results – Dependent Development

Dependent development-impacts were assessed during the Outline Business Case (OBC) stage of the project:

- Land value gains from unlocked housing development sites totalled £74 million.
- Additionality analysis (the extent the scheme would support additional economic activity associated with unlocked developments) indicated that the scheme, through facilitating developments would generate:
  - 6,300 additional jobs in the area;
  - £136 million additional GVA during construction;
  - Annual GVA benefits of £98 million per year.
  - Annual Council Tax receipts of £11.9 million per year; and
  - Business Rate income of £3.7 million per year.

The additionality of the economic impacts of the new developments are summarised in Table 3.8

Table 3.8 Summary of Impact of Unlocked Development.

Impact	Reference Case (without Scheme)	With Scheme	Additionality	
Jobs (Construction)	1,796	5,448	3,652	
Jobs (Operational phase)	1,811	4,461	2,650	
GVA (Construction)	£64.8m	£201.5m	£136.7m	
GVA (Operational phase)	£66.9m	£165m	£98.1m	Annual recurring
Council Tax receipts	£4.1m	£16m	£11.9m	Annual recurring
Business Rate income	£2.4m	£6.1m	£3.7m	Annual recurring

Source: A30 to St Austell Link Road Outline Business Case, March 2017

Without the new Link Road, the economic impacts would only be approximately one third of those that could be achieved. Although these impacts do not form part of the BCR calculations, they do give an indication of the economic potential that could be achieved in an area that has struggled to attract sufficient inward investment in recent years.

Another indicator of potential additionality emerged from the business survey work where firms were asked to estimate the cost savings to them if the road was built. Although indicative and based on the firms' estimates of these savings, by converting the sample size to cover all businesses in the area and by discounting the total annual cost saving over the 60 year appraisal period, a total of £15.1 million could potentially be saved by businesses. This windfall could be re-invested in the businesses for expansion and taking on more local workers.

3.2.4 Wider Impact Analysis Results Overview

In summary the analysis of wider economic impacts shows that under the core scenario the scheme would result in an additional:

£25.2 million static agglomeration

£2.0 million output change in imperfectly competitive markets

£150 thousand labour supply welfare impacts

£22.3 million additional GDP nationally by 2037 with £21.7m originating in Cornwall.

Together wider economic welfare impacts increase PVB from £99 million to £128 million

Giving an adjusted BCR of 2.07 for core scenario

Under alternate growth scenarios adjusted BCR are slightly lower (1.96 in high growth scenario, 2.04 in low growth scenario)

Land value gains from developments sites 'unlocked' by the link road are worth £74 million. These new developments could accommodate 6,300 jobs in the area; annual GVA benefits of £98 million per year; annual council tax receipts of £11.9 million per year; and business rate income of £3.7 million per year.

3.3 Key Assumptions and Parameters:

The analysis of wider impacts for the St Austell to A30 link road has followed WebTAG guidance; no supplementary economic modelling has been undertaken:

- The key assumptions and parameters for the appraisal of productivity impacts have been taken from TAG Unit A2.4
- The key assumptions and parameters for the appraisal of employment effects have been taken from TAG Unit A2.3
- The key assumptions and parameters for the appraisal of induced investment have been taken from TAG Unit A2.2

3.4 Understanding Uncertainty:

TAG Unit A2.1 acknowledges that economic impacts are always uncertain. Uncertainty surrounds the counterfactual, nature of a shock and the response of different economic agents to a shock. Its extent depends on the quality and availability of data; as well as the quality of analysis. It goes on to recommend that this uncertainty should be reflected in the reporting of impacts, so that stakeholders have a fuller understanding as to the sensitivity of results to the underlying assumptions; and that within each level of analysis it is important to understand the range of impacts and the associated uncertainty.

Level 1 analysis (standard CBA) has been informed by developing an uncertainty log leading to development of core, high and low scenarios as discussed in section 3.2.2.3

TAG Unit A2.4, section 5 recommends a series of sensitivity tests that may be relevant appraisal of schemes. As part of Level 2 analysis for the St Austell to A30 link road the following sensitivity tests have been identified as relevant and undertaken to inform the uncertainty analysis of the static agglomeration impact quantification:

1. **Sensitivity test for static clustering for inter-city schemes – distance decay parameter.** A sensitivity test varying the value of the decay parameter. This test uses the highest value of the distance decay parameters (as provided in the Wider Impacts Dataset). This is to reflect the evidence that the strength of agglomeration impacts diminishes with distance.

2. **Sensitivity test for static clustering for inter-city schemes – Business traveller decay parameter.** Business travel can be particularly prominent on inter-city travel and the robustness of the agglomeration estimate has been assessed by applying a decay rate to this travel purpose that is the average of the decay rates across consumer and producer services.

Table 3.9 summarises the scale of agglomeration impact under each of the sensitivity tests. In both sensitivity tests agglomeration benefits increase.

Table 3.9 Agglomeration Sensitivity Tests

Sensitivity Test		Agglomeration Impact (£'000)	Difference to core scenario
Core scenario		£25,220	
static clustering for inter-city schemes	distance decay parameter	£28,986	+15%
	Business traveller decay parameter.	£27,554	+9%

3.5 Informing the welfare and non-welfare measures

WebTAG highlights that it is crucial to distinguish between welfare and non-welfare measures and both should be reported in the Economic Case. However, only welfare measures contribute to wider impacts included in the adjusted BCR whereas Non-welfare measures, where they usefully inform the extent to which economic objectives are met, may also be referenced in the Strategic Case.

The Adjusted BCR for the St Austell to A30 link road includes the following level 2 welfare impacts calculated based on TAG Unit A2 guidance:

- Productivity impact – static agglomeration
- Tax revenues resulting from labour supply impacts. This reflects both the increase in tax revenue (income tax, national insurance contributions and corporation tax) and the reduction in out of work subsidies. As recommended in TAG Unit A2.3 has been taken as 40% of the resultant change in GDP due to labour supply impacts.
- Welfare associated with output change in imperfectly competitive markets. As recommended in TAG Unit 2.2 this has been taken as equal to the increase in GDP associated with output change in imperfectly competitive markets; estimated as a 10% uplift on business user benefits

The following non-welfare impacts have also been calculated to support the Strategic Case:

- Number of new jobs locally and nationally
- Additional GDP due to changes in employment

4. Analysis using WITA 2.0

4.1 Introduction

Towards the end of the work to develop the full business case for the St Austell to A30 link road DfT formally released software that applied WebTAG guidance to calculate wider impacts of transport schemes. The software, WITA 2.0, became available from the start of June 2019. By this date wider impacts appraisal work had largely been completed using a spreadsheet-based model, originally developed at OBC stage and refined as part of the full business case work.

It was requested by the DfT that assessment is repeated using WITA software. This exercise is reported in this chapter. It should be noted that although analysis has been repeated with WITA extensive work required to reconcile any differences in results has not been undertaken.

4.2 Methodology

Wider impacts have been calculated using DfT software WITA 2.0.

The software manual describes WITA (Wider Impacts in Transport Appraisal) as a computer program developed for the Department for Transport to estimate wider impacts of transport schemes i.e. welfare impacts that are not part of conventional transport user benefit appraisals (TUBA). The purpose of WITA is to undertake the estimation of wider impacts in accordance with the Department's guidance as set out in TAG Unit A2.1 'Wider Economic Impacts Appraisal' and associated Units A2.2 to A2.4.

The following level 2 wider impacts have been estimated for the St Austell to A30 Link Road in WITA 2.0:

- Employment Effects (TAG Unit A2.3) - Labour market impacts from more/less people working: the tax revenue associated with the impact on labour supply of reduced commuting costs due to a transport scheme.
- Productivity Impacts (TAG Unit A2.4) - Agglomeration impacts: the benefits of increased concentration of economic activity over an area. Transport schemes can deliver increases in productivity by improving the accessibility of an area to firms and workers, thereby affecting effective density and the productivity benefits of agglomeration.

Induced Investment impacts (increased or decreased output in imperfectly competitive markets) have not been estimated in WITA as the methodology (a 10% uplift of business user benefits) is identical to that already applied for this business case.

WITA has been run using the latest DfT Wider Impacts Dataset (Version 3.1 - DfT May 2019). This is the same economic parameters used in the spreadsheet assessment reported earlier in this report.

In setting up the WITA analysis the following assumptions have been made:

- the Preferred Option has been assessed (compared against the Do Minimum);
- highway model data for the Do Something and Do Minimum scenarios (trips, time and distance matrices) originally prepared for the level 1 TUBA assessment have been used;
- changes in time and distance have been retained only for trips within, to or from Cornwall. All other movements have the same data in Do Minimum and Do Something scenarios;
- intra-zonal trips are not assigned in the transport model, so do not have time or distance data. Values have been estimated as ½ trip time and distance to nearest neighbour; and
- transport data has been linearly interpolated between transport model years.

The WITA software follows the same calculation stages as the wider impacts spreadsheet model developed for this business case and recommended by DfT in TAG units A2-1 to A2-4.

The initial stage is calculation of demand weighted average generalised costs across modes (not relevant in this case as only highway costs are considered), time periods and trip purposes. Matrices are then aggregated from the transport model zone system to the WITA zone system level. For this analysis the following WITA zones have been defined:

- Cornwall
- Plymouth
- Devon
- Torbay
- Somerset
- Dorset
- Rest of England, Scotland & Wales

The WITA cost averaging process generates cost matrices from which wider impact estimates are then calculated. In WITA average generalised cost is calculated based on demand weighted averages using demand matrices supplied by the user. A consequence of this is that cost data for any movements within the transport model where demand is zero will not be included in the calculation of average cost (as it is given a demand weighting of zero). This is valid if demand for the movement is truly zero, however, becomes a critical issue when the transport model (as is common for local scheme models) does not include demand for all national movements i.e. it only represents trips to, from with or through the study area.

Figure 4-1 below shows the movements (at WITA zone level) where demand is non–zero in the transport model

Figure 4-1 Movements with Non-Zero Transport Demand

	Cornwall	Plymouth	Devon	Torbay	Somerset	Dorset	Rest of England, Scotland & Wales
Cornwall	✓	✓	✓	✓	✓	✓	✓
Plymouth	✓						
Devon	✓		✓		✓		✓
Torbay	✓						
Somerset	✓		✓		✓		✓
Dorset	✓						
Rest of England, Scotland & Wales	✓		✓		✓		✓

The exclusion of costs for movements with zero demand has a material impact on wider impacts results from WITA. For example, by not considering costs from the 'rest of England, Scotland & Wales' to all areas when calculating effective density for the 'rest of England, Scotland & Wales' means that changes in costs to /from Cornwall (as occurs when the scheme is introduced) disproportionately affects the value of the overall effective density of rest of England, Scotland & Wales. If costs were included for all movements then the value of effective density of rest of England, Scotland & Wales would be based on average cost across all zones (the majority of which would remain the same in Do Minimum and Do Something) and the relative change in effective density between Do Minimum and Do Something would be smaller. Change in effective density between Do Minimum and Do Something is the key driver of the productivity impacts calculated by WITA

To investigate the scale of impact of this issue three scenarios have been considered:

- **Scenario A** – transport demand used in the assignment model has been used directly (demand therefore is zero for movements highlighted in Figure 4-1). This scenario is likely to overestimate wider impacts of the scheme as some movements where costs do not change are excluded from the effective density calculation.
- **Scenario B** – where transport model demand is zero for all movements making up WITA zone-to-WITA zone movements demand in matrices input to WITA has been manually set to following values (Business:19.9%, Commute: 80.1%). These average all-week tip purpose shares have been taken from TAG Databook. Arranging the demand matrix in this way forces WITA to calculate a demand weighted average cost using TAG trip proportions. – This scenario is still likely to overestimate wider impacts of the scheme as the transport model does not include all trips within the Cornwall WITA zone (instead the matrices focus on trips to/from and within the study area). This means that many movements to and from Cornwall WITA zone, which are not impacted by the scheme, are excluded in the calculation of change in average generalised cost, overrepresenting the scheme impact on average generalised cost to/from Cornwall.
- **Scenario C** – change in generalised cost between DM and DS to/from/within Cornwall has been scaled to reflect that the transport model does not include all demand within Cornwall (instead focusing on trips to/from and within the study area). It has been estimated that the transport model study area only represents 15% of the trips within (all trips associated with the 10.8% of the total Cornwall population within the study area and 5% of the trips of remaining population); and, therefore without scaling average costs would overrepresent scheme impacts – This scenario will most closely represent the impact of the scheme on average generalised cost between WITA zones when considering average across all movements.

Scenario A and Scenario B have been modelled in WITA. A key feature of WITA (in contrast to the spreadsheet-based model) is the inability to interrogate the resultant average generalised cost matrix, or to make any adjustments to correct any misrepresentation of scheme impacts due to the incomplete representation of national demand. It has therefore not been possible to generate a WITA run for Scenario C – where cost changes (DS-DM) to/from and within Cornwall take fully into account all movements when calculating demand weighted averages; rather than just the modelled movements focussing on the study area.

Scenario C is, however, represented in the spreadsheet-based model where it has been possible to adjust average generalised cost inputs to the wider economic impact calculations.

4.3 WITA Results

Table 4.1 below summarises the results of the WITA estimation of the wider impacts of the St Austell to A30 Link Road (for scenarios A and B) and compares the results against those calculated using the spreadsheet-based model for Scenario C.

Table 4.1 Wider Impacts estimated using WITA 2.0

	Discounted PVB (£'000, 2010 prices)				
	Scenario C	Scenario B		Scenario A	
Impact	Estimated in Business Case Model	Estimated in WITA 2.0	Difference to Scenario C Estimate	Estimated in WITA 2.0	Difference to Scenario C Estimate
Static Agglomeration	£25,220	£70,411	+£45,191	£174,782	+£149,562
Output change in imperfectly competitive markets	£3,181	£3,181	-	£3,181	-
Labour Supply Impacts	£147	£3,709	+£3,562	£3,704	+£3,558
TOTAL	**£28,548**	**£77,301**	**+£48,753**	**£181,668**	**+£153,120**

Annex C-10.1 Checklist for Appraising Agglomeration Impacts

WebTAG provide a checklist of key points to use in setting up the analysis framework for assessing productivity and for checking back and identifying any potential issues that may affect the robustness of the analysis.

The tables below outlines the aspects of the analysis work to appraise the St Austell to A30 link road that have been reviewed.

Table 4-2 Data Checklist

Data Checklist

Issues	Check	
Look and confirm that the generalised costs are comparable (same units) across the modes and purposes (including passenger/goods vehicles) that need to be considered.	✓	Model data was extracted in seconds and metres Consistency of units throughout analysis was checked and confirmed
Determine that all necessary journey purposes are included (business and commuting).	✓	Transport model includes Car Commute, Car Business; Car Other LGV and HGV userclasses. Generalised costs have been taken as a demand weighted averaged over all classes excluding Car Other
Determine that all necessary modes are included.	✓	Car mode considered as levels of rail and bus usage for business and commuting trips in the area is low.
Check the definitions of any segmentation of modelled data by car-ownership or car-availability levels, or by any other dimensions like time of day or socio-economic group, since it will be necessary to average over these segments to provide the generalised costs for use in the calculations.	✓	Generalised costs have been calculated as a demand weighted averaged over all classes excluding Car Other; and all modelled time periods (AM, IP, PM)
Find out how intra-zonal values have been obtained (e.g. using values that were used in the transport modelling, or estimated/assumed values). The documentation needs to make it clear how intra-zonal trips have been estimated.	✓	For transport model zones Intra-zonal trip costs have been estimated based on ½ the cost to the nearest neighbouring zone. Costs have then been aggregated to LAD zones using demand weighting – intra-zonal LAD zone costs are therefore derived from a combination of modelled data (for non intra-zonal model ODs) and estimated data for intra-zonal model ODs
Confirm if generalised costs are for one-way travel or for round trips. The values should be estimated in a consistent way.	✓	All costs have been defined for one-way trips.

Table 4-2 Completeness of Data Checklist

Completeness of Data

Issues	Check	
Are Walking and Cycling modes modelled? (Walk mode is often not modelled, but walk times can usually be calculated from network distances, which are nearly always available. In some areas, cycling is also significant and needs to be considered).	✓	Walking and cycling modes are not considered as wide travel to work area of St Austell means low levels of commuting on foot or by bicycle
Is the transport model adequately detailed outside the main area of interest? (Problems that can arise include some modes being omitted outside the core area of the transport model, congestion not being considered outside the core area, and only modelling the corridor of interest: in this case the narrowness of the transport modelling will be insufficient for productivity analysis).	✓	Transport model does not model all travel within Cornwall (the LASD of the scheme). To overcome this, changes in generalised cost between Do minimum and do something scenarios have been scaled to represent the fact that the model only represents 15% of travel to/from and within Cornwall LAD

Table 4-3 Consistency of Data Checklist

Consistency of Data

Issues	Check	
Do the differences in generalised costs show reasonable patterns, in particular: • Do generalised costs generally increase for longer journeys? • Do the differences in generalised costs across modes look reasonable? • What, if any, generalised costs are supplied where the mode data is not immediately available from the model? How were these estimated and tested for robustness? • Do the generalised costs change in the expected directions if transport supply improvements are introduced?	✓	Generalised costs from the transport model have been reviewed and validated as part of the model development workstage

Table 4-4 Agglomeration Impacts Checklist

Agglomeration Impacts

Topic	Issues	References/notes	Check	
Geographical extent: is the geographical coverage sufficient? i.e. is the model system large enough to take account of the majority of interactions to/from the area of interest?	Is there a risk of overstating the impacts case by not considering effective density over a wide enough base due to not considering interactions with places beyond the modelled area?	The agglomeration calculations depend on modelling a large enough region to set the journeys affected by the scheme in context with all other significant journeys that are not affected by the scheme. Considering too small an area will tend to exaggerate the impact of proposals.	✓	The fully modelled area of the transport model is sufficient to capture the impacts of the scheme. However, it does not cover all trips made in Cornwall. As the wider impact analysis zone covers the whole Cornwall LAD area it has been necessary to make adjustments to ensure the change in average generalised cost between DM and DS reflects the average change across all trips in Cornwall, not just the sub-set of trips included in the model (which are disproportionately impacted by the scheme). This has been done by factoring the change in generalised cost between DS and DM to reflect that model only represents 15% of trips to/from and within Cornwall and it has been assumed remaining 85% of trips would be unaffected by the scheme.
Transport modelling issues – is modelling consistent with this Unit and with other WebTAG guidance?	Completeness of data (modes, journey purpose, zone pairs).	Note that the transport data requirements (e.g. demand and generalised costs by mode and journey purpose) for agglomeration analysis are greater than the requirements for analysing conventional transport user impacts.	✓	Car mode has been considered due to low use of PT modes in the study area for business and commuting trips. Costs have been averaged over Business, Commute, LGV and HGV users.
	Treatment of problem issues (e.g. missing intra-zonals).	A number of likely problems arising from the greater transport data requirements of WIs analysis are discussed, along with potential solutions, in Appendix C.	✓	For transport model zones Intra-zonal trip costs have been estimated based on ½ the cost to the nearest neighbouring zone. Costs have then been aggregated to LAD zones using demand weighting – intra-zonal LAD zone costs are therefore derived from a combination of modelled data (for non intra-zonal model ODs) and estimated data for intra-zonal model ODs.
Employment data issues	Is the base case employment data taken directly from NTEM, or from another forecast?[2]		✓	Standard Employment data from TAG wider Economics dataset (Version 3.1 - DfT May 2019) has been used. Employment projections until 2051 are based on NTEM 7.2. Post-2051 projections are aligned with OBR long-run assumptions, as presented in WebTAG.

[2] A land use model which fully interacts with the transport model can be used to estimate scheme impacts on employment location.

Agglomeration Impacts

Topic	Issues	References/notes	Check	
Scale of the productivity impacts	Compared to the other economy impacts.	Experience to date is that agglomeration is usually the largest of the wider economic impacts.	✓	The agglomeration impact is 88% of total wider impacts in core scenario
	Compared with the TEE benefits.	Previous experience is that where productivity impacts are relevant they are generally in the range of 10% to 30% of total TEE user benefits; see Feldman et al (2008).	✓	The agglomeration impact in the core scenario is 29% of level 1 TEE table Present Value of Benefits (PVB)
Dynamic clustering	Have both dynamic clustering and MTMPJ effects been estimated?	See TAG Unit A2.4 – Employment for further information on estimation of the move to more/less productive jobs.	✘	Not assessed as not considered relevant in Economic Narrative
	Have transport external costs been estimated for the change in land use?	See TAG Unit A5.4 for further information for applying Marginal External Costs.	-	
	Do calculations of dynamic clustering take into account both productivity gains and losses from relocation of households and businesses?	Dynamic clustering and the move to more/less productive jobs can comprise of both productivity gains and losses from relocation of employment and agglomeration/ dis-agglomeration.	-	
	Have the GDP and welfare impacts been separately estimated?		-	
Analysis issues	To what extent are the benefits/ dis-benefits the result of the present spatial patterns of productivity?	Where benefits stem from the fact that present productivity levels are higher in one area than another, some comment should be added on whether these differentials can be expected to persist. If the area with lower productivity is the subject of interventions to increase its productivity, it may not be reasonable to assume that the differential is fixed.	-	M2MPJ not assessed as considered relevant in Economic Narrative
	Sensitivity tests - what has been done and what does it indicate?		✓	High and low growth scenarios reported in Section 3.2.2.3 Sensitivity Tests reported in Section 3.4
	Factoring impacts over the appraisal period and discounting over time	What time profiles and assumptions have been used to extrapolate from modelled years across the appraisal period? Are discount and profile rates consistent with WebTAG?	✓	Transport costs have been linearly extrapolated between modelled years (2022, 2037) Travel costs have been assumed to remain at 2037 in following years Standard WebTAG discount rates have been used to discount welfare benefits.

Agglomeration Impacts

Topic	Issues	References/notes	Check	
	Comparison of spatial distribution of agglomeration benefits with conventional transport user benefits.	Whilst agglomeration impacts are likely to be greatest in urban areas, this is not necessarily true of user benefits. Understanding how the two compare geographically and articulating the differences are highly beneficial to the interpretation of the analysis.	✓	90% of productivity impacts occur within South West England. This is consistent with the nature of the local economy in and around the St Austell area which does not play a major national role in the key industrial sectors of the economy.

Annex C-10.2 Checklist for Appraising Output Change in Imperfectly Competitive Markets

WebTAG provide a checklist for appraising output change in imperfectly competitive markets. The table below outlines the aspects of the analysis work to appraise the St Austell to A30 link road that have been reviewed.

Table 4-5 Appraising Output Change in Imperfectly Competitive Markets Checklist

Checklist for Appraising Output Change in Imperfectly Competitive Markets

Issues	Check	
Provide evidence that businesses will increase output in response to the transport improvement	✓	Included in Economic Narrative – Business surveys indicated that poor accessibility is a barrier to business growth in the region.
Valuing transport user benefits	✓	Level 1 Cost Benefit Appraisal has been undertaken to value transport user benefits. This analysis provides a measure of business user benefits.
Value the wider economic impact from output change in imperfectly competitive markets	✓	In line with TAG guidance OCICM wider impacts have been taken as 10% of business user benefits. This welfare measure has contributed to the PVB used in estimating the adjusted BCR.

Annex C-10.3 Checklist for Appraising Employment Effects

WebTAG provide a checklist of the key evidence requirements when appraising labour supply impacts. The table below outlines the aspects of the analysis work to appraise the St Austell to A30 link road that have been reviewed.

Table 4-6 Appraising Labour Supply Impacts Checklist

Checklist for appraising labour supply impacts

Issues	Check	
Provide context-specific evidence that insufficient transport accessibility is a barrier to people entering employment	✓	Provided in the Economic Narrative
Estimate change in GTC resulting from transport scheme	✓	Future year transport model provides time and distance for all ODs 'with' and 'without' the scheme in place. Using the valuation methodology in TAG unit A1-3 user and provider impacts these data have been used to calculate generalised travel cost for each movement in Do minimum and do something scenarios. From these changes in GTC have been calculated
Estimate change in jobs and GDP resulting from transport scheme	✓	Using the change in GTC and the approach outlined in TAG Unit A2.3the change in jobs and GDP resulting from the St Austell to A30 Link road have been estimated. Standard parameters from TAG wider impacts dataset have been used in the calculations.
Estimate tax wedge associated with increased GDP	✓	In line with TAG guidance the tax wedge has been estimated as 40% of change in GDP associated with labour supply impacts of the scheme. This welfare measure has contributed to the PVB used in estimating the adjusted BCR.

Annex C-10.4 Checklist for Appraising Dependent Development

WebTAG provide a checklist of the key evidence requirements when quantifying and valuing site-specific dependent developments. The table below outlines the aspects of the analysis work to appraise the St Austell to A30 link road that have been reviewed.

Table 4-5 Site-Specific Dependent Development Checklist

Site-Specific Dependent Development Checklists

Issues	Check	
Identify and quantify potential site-specific developments;	✓	Individual sites considered during OBC stage work
Demonstrate that these developments are 'dependent' on the transport improvement	✓	Three sites dependent upon link road to progress were identified during OBC stage work (out of 30 considered in the study area).
Identify market or government failures associated with these developments	✓	Included in Economic Narrative
Demonstrate that welfare gains from site-specific dependent developments are 'additional' at the national level (i.e. increase the productive capacity of the country)	✓	See section 3.1.3.1. low level of leakage or displacement expected
Identify and value other public-sector costs associated with enabling dependent developments	✓	New developments are expected to be privately managed, financed and delivered
Estimate the welfare impacts associated with these site-specific dependent developments	✓	Welfare impacts of dependent developments not considered as part of adjusted BCR
(If required) estimate the jobs and GDP impacts associated with site-specific dependent developments	✓	See section 3.2.3 – although these results only inform qualitative VfM judgement and do not contribute to welfare based adjusted BCR calculation.
Undertake uncertainty and scenario testing	✓	Differing levels of general growth considered in high and low growth scenarios.