A582 South Ribble Western Distributor

Lancashire County Council

Economic Assessment Report

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Business Case Supporting Document

A582 South Ribble Western Distributor

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Contents

1. Introduction

1.1 Purpose of Report

This document represents the Economic Assessment Report (EAR) for the A582 South Ribble Western Distributor (SRWD) upgrade for Lancashire County Council (LCC). This report details the appraisal assumptions and methodology used in the economic assessment of the scheme impacts to support the SRWD Strategic Outline Business Case (SOBC).

As required by WebTAG Unit A1.1, this document details the methodology used for appraisal of the Core Scenario as described in the Traffic Forecasting Report (TFR July 2019) and assesses the impact of dependant developments as detailed within the same document.

The methodological approach for this assessment is in line with WebTAG and also inherited from the Preston Western Distributor (PWD) scheme resulting in use of same data and methods when relevant. In any such instance it is clearly stated in the document. The approach taken for the economic appraisal of this scheme is proportionate at the SOBC stage of appraisal. The Appraisal Specification Report (2019) for the SRWD scheme which details the methodological approach has been reviewed and approved by the DfT.

The monetised impacts presented in this report are used to inform the overall Value for Money (VfM) assessment of the scheme.

1.2 Background and Context

Lancashire County Council (LCC) is seeking MRN funding to enhance economic growth and housing provision through the delivery of a significant road improvement scheme on the A582 in South Ribble to the south of Preston.

The A582 South Ribble Western Distributor (SRWD) is identified in the Transport for the North's (TfN) Investment Programme as one of the schemes to be delivered before 2027, which will contribute towards delivery of the pan-Northern objectives of the TfN Strategic Transport Plan.

It is also the last of the four major highway schemes identified in the Preston, South Ribble and Lancashire City Deal, agreed with Government in September 2013 to deliver transformative, nationally significant levels of housing and employment growth in the Preston City Region (comprising the City of Preston, the Borough of South Ribble and the Borough of Fylde).

As set out in the Investment Planning Guidance, for the MRN schemes that are scheduled to begin by April 2023, they should be developed to at least SOBC stage. The A582 SOBC will however benefit from detailed traffic modelling and economic assessment and therefore it is expected that some of the elements of the Business Case, particularly the Economic Case, will largely meet requirements for the Outline Business Case.

1.3 Scheme Description

The A582 South Ribble Western Distributor is located in Central Lancashire and is one of the radial routes connecting Preston with the M65 (Figure 1.1). It is a modern standard, part single and part dual two-lane road with access generally restricted to major junctions that are either roundabouts or controlled by traffic signals, and a partial grade-separated junction providing a link with the local road network in the Cop Lane area of Penwortham.

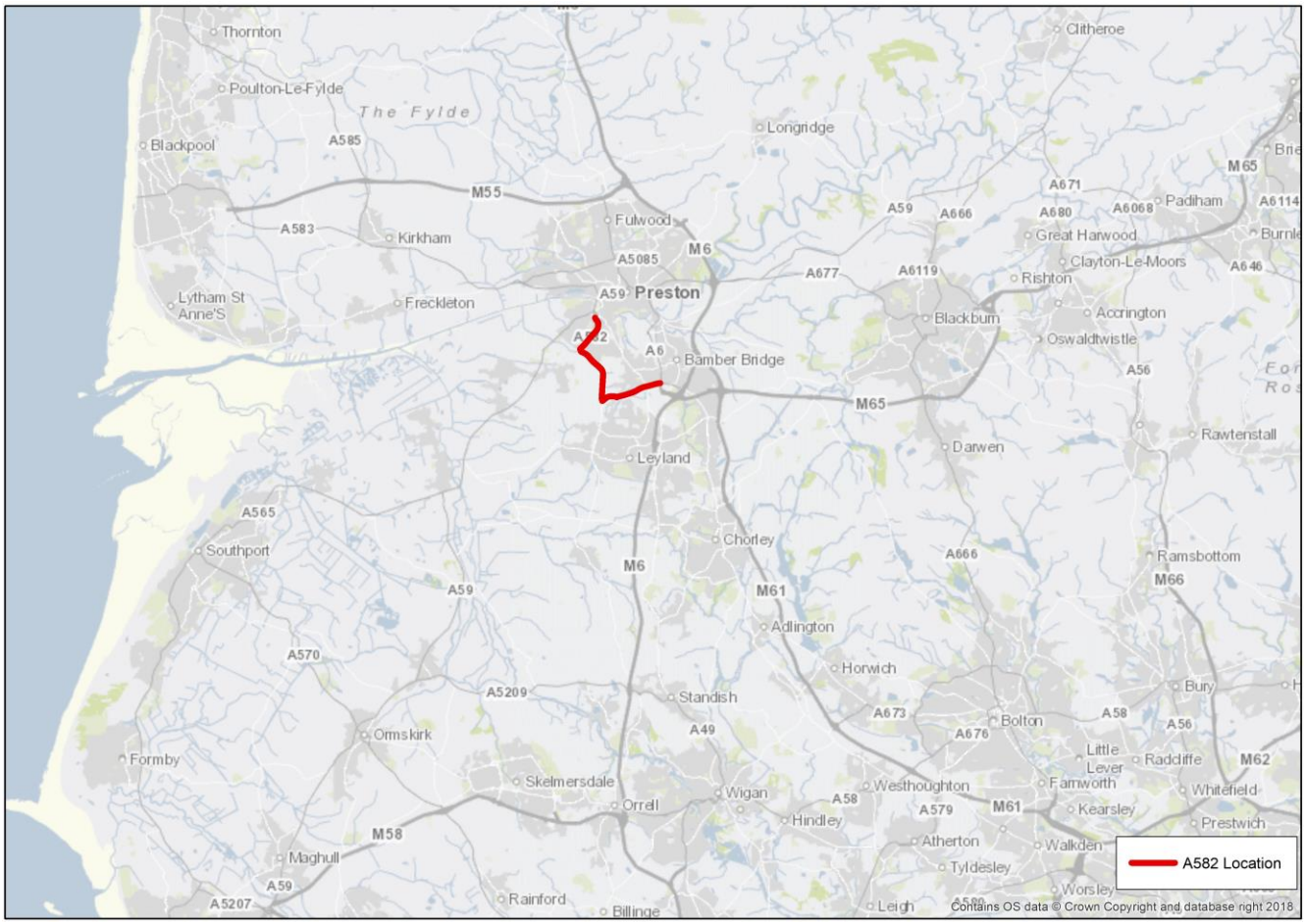


Figure 1.1: A582 South Ribble Western Distributor Location

The A582 SRWD upgrade scheme was identified a key component of the programme of measures set out in the adopted Central Lancashire Highways and Transport Masterplan that collectively will support the scale of development set out in the approved Central Lancashire Core Strategy and mitigate its impact on the transport network.

It is also one of the four major highway schemes that will be delivered as part of the Preston, South Ribble and Lancashire City Deal signed with the government in September 2013 The City Deal aims to transform Central Lancashire, creating 20,000 net new private sector jobs and delivering over 17,000 new homes, growing the local economy by over £1 billion.

The SRWD preferred option consists of the dualling and widening of the existing A582 corridor to support delivery of South Ribble's strategic housing allocations (consisting over 2,700 dwellings) and the Cuerden, Leyland Business Park and Lancashire Business Park strategic employment sites.

The scheme includes provision of a 5.2 kilometre stretch of dual two-lane carriageway with solid concrete central reservation barrier with a parallel segregated combined cycle track/footway, providing a total transport corridor generally 35 metres wide, along the existing A582 corridor between Broad Oak Roundabout and Stanifield Lane Roundabout. Additionally, 0.5 kilometres of narrow widening from dual two-lane to dual three lane on the westbound carriageway between the South Rings Roundabout and Stanifield Lane and 0.25 kilometre of widening from dual two-lane to dual three-lane of the northbound carriageway between the M65 Terminus Roundabout and South Rings Roundabout will be provided. The segregated 3-metre-wide combined

cycle track/footway will be provided along one side of the carriageway, separated from the carriageway by a 0.5m buffer strip, and will be built along the east side of the A582 Penwortham Way, and the South side of the A582 Flensburg Way and Farington Road.

The scheme has been designed in accordance with the Design Manual for Roads and Bridges (DMRB), which is the accepted industry standard, as well as IAN 149, 195, and the Traffic Signs Manual. The speed limit along the upgraded road will be 50mph. The route will be lit along its full length including at junctions and crossings.

The scheme includes construction of a new bridge adjacent to the existing structure over the West Coast Main Line (A582 Farington Link) and replacement of the Woodfield Railway Bridge on the Preston to Ormskirk line to accommodate the new dual carriageway. The scheme will also require widening and adaptation of existing structures providing underpasses and crossing waterways. The County Council has recently completed major improvement schemes at five junctions along the route, shown in Table 1.1 including provision to accommodate an upgrade of the route to dual carriageway. The scheme will tie in with these improvement schemes at these junctions, requiring no further improvements. Improvement of the Croston Road junction forms part of the scheme. This will replace the existing dumbbell roundabout junction with a new staggered signalised junction.

Table 1.1: Improved Junctions Since Base Year 2013

Scheme	Completion Date
Pope Lane- converting the roundabout to a signalised crossroads junction	2017
Chain House Lane junction widening and further improvements to accommodate dual carriageway on A582	2014
Tank Roundabout widening and signalisation	2016
Stanifield Lane Junction improvements – signalisation and widening of the roundabout	2016
Golden Way North/South – signalisation and junction widening	2015

In addition, the scheme will include junction improvements at the Penwortham Triangle and M65 Terminus junctions to accommodate the additional future demand anticipated because of strategic developments and changes in route choice resulting from the dualling/widening of the A582. The Penwortham Triangle improvement will replace the existing A59/B5254 priority roundabout with a signalised junction to de-prioritise the B5254 and prioritise through traffic on the A59 connection, as well as upgrading the A59/Liverpool Road signalised junction to provide a dedicated right turning lane onto Liverpool Rd for the Ribble crossing access to Fishergate and Preston Station.

The M65 Terminus junction improvement will create a new access to the Cuerden Strategic Employment Site from a new western arm of the roundabout, segregation of traffic from the M65 and M6 into separate lanes on the approach to the junction, and signalisation of the roundabout to improve safety. The junction improvements will take place within Lancashire County Council's highway ownership but will involve some alterations to the approach which includes Highway England's network. Highways England have been consulted and are supportive of the proposed highway changes.

The extent of the scheme is shown in Figure 1.2.

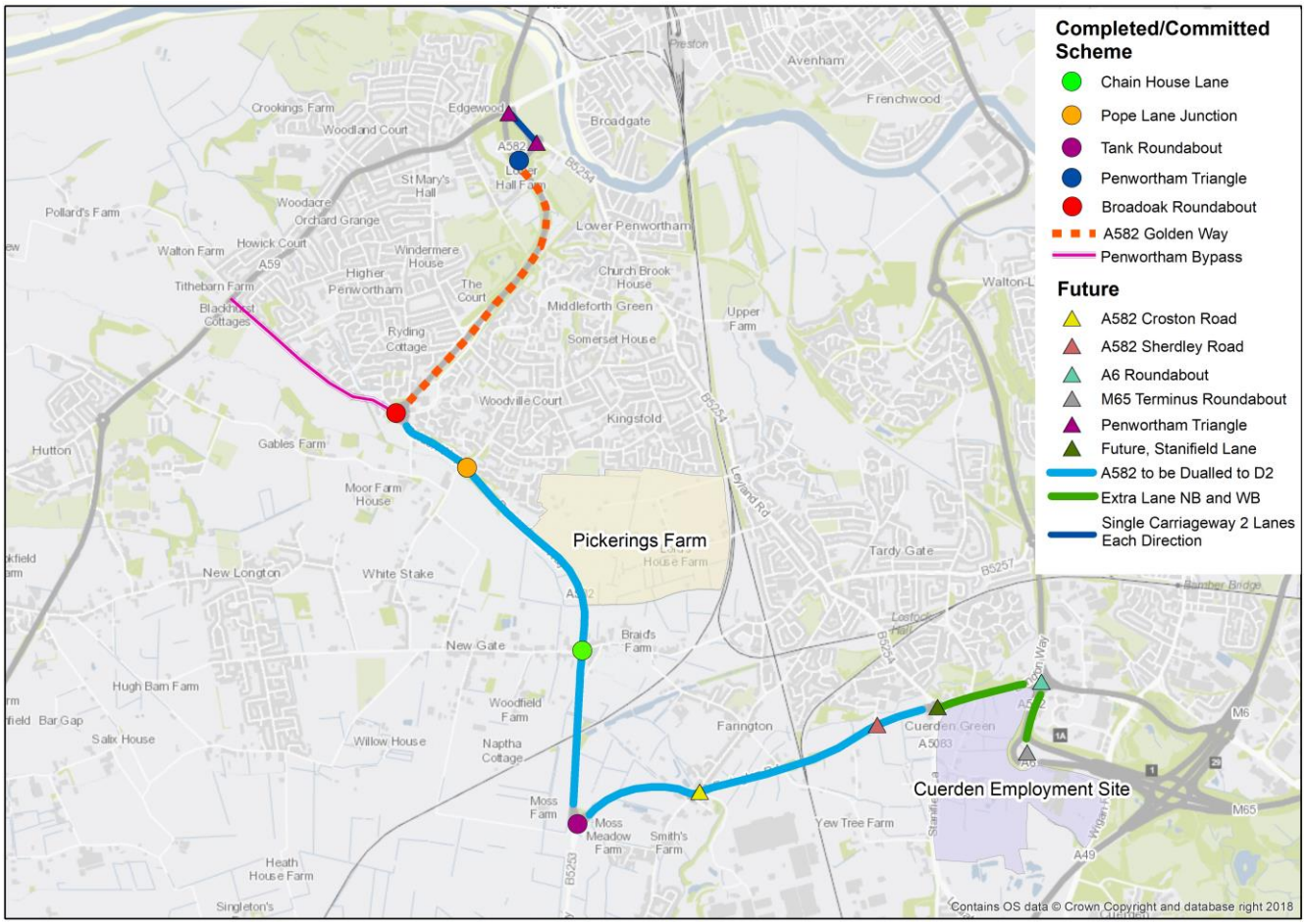


Figure 1.2: Extent of the A582 South Ribble Western Distributor Upgrade Scheme (Including Upgraded Junctions)

1.4 Scheme Objectives

The A582 scheme is a key component of the programme of measures set out in the Central Lancashire Transport Masterplan that collectively will support the scale of development set out in the approved Central Lancashire Core Strategy and will mitigate its impact on the transport network.

The scheme is expected to offer the following outputs and benefits:

- Primary Objectives:
  - Reduce congestion on arterial routes between Preston city centre and the Strategic Road Network
  - Support Economic Growth in South Ribble through full development of, and access to, the Cuerden Strategic Employment Site
  - Support delivery of housing sites accommodating over 2,700 new dwellings south of Preston
  - Support sustainable and active modes by facilitating the provision of bus network improvements and enhanced walking and cycling facilities on routes connecting South Ribble to key economic sites in Preston City Centre and the Cuerden Strategic Employment Site
  - Reduce pressure on the SRN, particularly the M6 between Junctions 29 and 32, by reducing local traffic movements using the SRN

- Supporting Objectives:
  - Enhance the public realm and local centres in South Ribble and Preston.
  - Improve road safety by reducing the frequency and severity of road traffic accidents in the study area.
  - Improve air quality and reduce noise pollution in residential areas of South Ribble and Preston.
  - Support further housing and employment growth potential in South Ribble.
  - Support the delivery of and access to a new Ribble Crossing with the A583 west of Penwortham.

1.5 Structure of the Report

The remainder of this report is structured as follows:

- Chapter 2 – Economic Assessment Approach: provides a general description of the economic assessment methodology.
- Chapter 3 – Traffic Modelling Inputs for Economic Assessment: provides a summary of the traffic model, which produces most of the inputs into economic analysis.
- Chapter 4 – Estimation of Costs: provides a detailed description of the various components that make up the scheme costs.
- Chapter 5 – Estimation of Benefits: provides a detailed description of the various components that make up the scheme benefits.
- Chapter 6 – Economic Assessment Results: provides a detailed description of the results of the economic analysis.
- Chapter 7 – Summary and Conclusions: provides a summary and conclusions to all the above.

2. Economic Assessment Approach

2.1 Introduction

Economic Assessment involves the determination of costs and benefits of a scheme using travel demand, traffic flows, journey times and other inputs from a traffic model.

This chapter provides a general description of the economic appraisal approach adopted for the A582 SRWD Strategic Outline Business Case. This is more detailed than a standard approach for economic assessment because as previously mentioned the scheme benefits from availability of a transport model.

The nature of the scheme, its objectives and potential impacts, as well as lessons learnt from previous projects have been considered in defining the economic appraisal approach. In line with WebTAG recommendation, it was also aimed to ensure that time and resources spent on the economic assessment are proportionate to the size of the investment.

The SRWD scheme is designed to promote economic growth whilst simultaneously delivering transport user benefits and business competitive advantage. Therefore, the focus of the economic assessment has been on capturing both traditional sources of scheme benefits, alongside wider economic benefits.

A WebTAG standard assessment requires consideration of the following impacts:

- **Transport Economic Efficiency (TEE) benefits**, consisting of two elements:
  - Travel time and Vehicle Operating Cost (VOC) benefits and disbenefits
  - Travel time and VOC benefits and disbenefits as a result of construction and maintenance activities
- Changes in **taxes**
- The impacts of the scheme on **Accidents**
- The **Environmental Impacts** (air quality, noise, greenhouse gases) calculated as part of Environmental Impact Appraisal
- The impacts of the scheme on **Journey Time Reliability**
- The **Wider Economic Impacts** of the scheme
- The **Costs** of the scheme, consisting of two elements:
  - Construction, land and compensation, preparation and supervision costs
  - Changes in maintenance costs

Each of the above elements informs the overall Value for Money of the scheme and is considered within the Appraisal Summary Table (AST). However, only some of these elements are currently included within the Analysis of Monetised Costs and Benefits (AMCB) and the calculation of the Initial Benefit to Cost Ratio (BCR).

There are also impacts that can be monetised, but the evidence relating to their appraisal is less developed and therefore there is less certainty about the robustness of their results. These elements contribute to the Value for Money of the scheme but are not part of the AMCB or BCR. In the context of the A582 SRWD economic appraisal journey time reliability benefits have been derived but not included in the BCR.

The wider impacts of the scheme are analysed. In line with WebTAG some of the wider impacts can be included in the Adjusted BCR. The wider economic benefits that are used to calculate the adjusted BCR are:

- labour supply impacts

- productivity (static clustering)
- output change in imperfectly competitive markets

Land value uplift benefits from unlocking dependent developments, i.e. from Pickerings Farm housing development and Cuerden Strategic Site, are also monetised but not included in the adjusted BCR. They are used as indicative monetised impacts to support the Value for Money conclusions of the scheme.

The relationship between each of the economic impacts, the AMCB, BCR and VfM is illustrated in Figure 2.1.

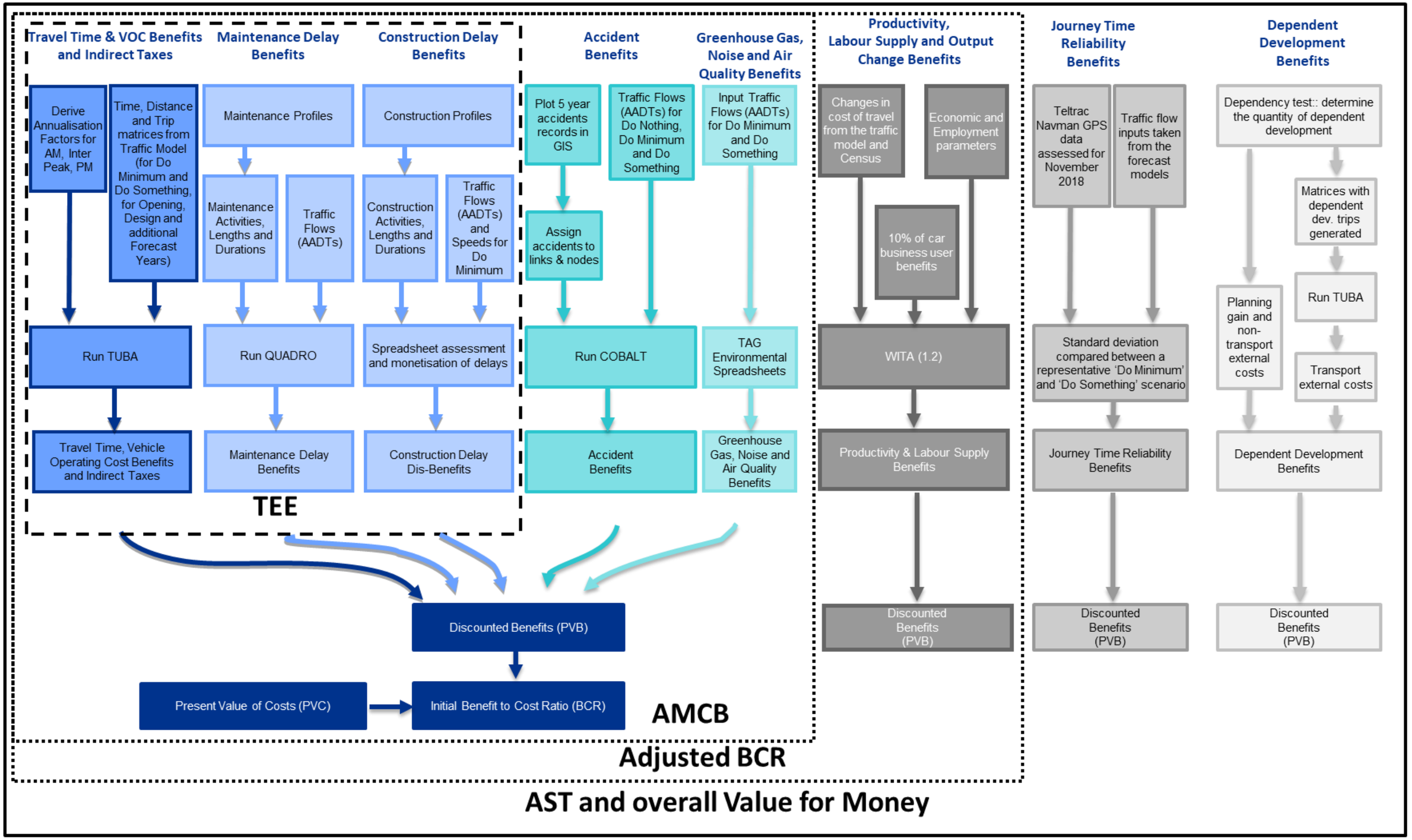


Figure 2.1: Economic Assessment Approach and Relationship between Each of the Economic Impacts, the AMCB, BCR and VfM

Along with the estimation of benefits, the costs are also required for the economic assessment of the scheme.

Costs can be defined as the total amount of money spent on constructing and maintaining the scheme. The costs are therefore referred to as 'scheme costs' and 'maintenance costs':

- Scheme costs are construction costs, land costs, preparation costs (planning and designing the scheme) and supervision costs during the scheme construction.
- Maintenance costs are the cost of people, machinery and materials required to maintain the highway network. These costs are also known as the Capital Costs of Maintenance.

2.2 Options Assessed

As discussed in the Options Assessment Report (July 2019), a large number of potential scheme options were identified across different modes. These were sifted into three packages of better-performing options, plus a 'Do Minimum' option. Following an option scoring process, one of these was identified as the best-performing option: **Option Package 4**. This consists of full dualling of the A582 delivered alongside a parallel cycle route.

The remainder of this Economic Assessment Report presents the value for money assessment of this option.

Another option was identified as the next best option and a low-cost alternative: Option Package 3. This consists of partial dualling of the A582 alongside a parallel cycle route, only between Stanifield Lane and Tank Roundabout. As the second-highest scoring option, this option is not assessed in this Economic Case, but will be progressed for further appraisal in the Outline Business Case.

2.3 Assessment Data and Tools

Transport User Benefit Appraisal (TUBA) – version 1.9.12 (January 2019) has been used to derive travel time benefits, VOC and indirect tax benefits of the scheme, as well as the impacts on the transport network of unlocking new development.

COst and Benefit to Accidents – Light Touch (COBA-LT) – version 2013.2 with parameter file 2018.1 (May 2018) has been used to derive the expected change in number of accidents and their associated cost to the economy.

QUeues And Delays at ROadworks (QUADRO) – version 2018 has been used to derive the cost of delay due to construction and maintenance works.

Teltrac Navman GPS (observed journey times) data has been used to determine journey time reliability impacts of the scheme.

The use of assessment tools in economic appraisal is discussed in more detail in Chapter 5.

2.4 Appraisal Period

To assess the economic benefits over the life cycle of the scheme, there is a need for minimum two forecast years to demonstrate the long-term benefits of the scheme. In line with WebTAG the two forecast years should represent the Opening Year and the Design Year of the scheme.

The Opening year of the scheme is forecast to be 2024. The traffic forecasting was undertaken for 2022 and 2037 (fifteen years after the opening) as part of the PWD scheme appraisal. As a proportionate approach for SOBC, the 2022 transport model outputs have been used as a representative for the Opening Year of the scheme.

As detailed in section 5.1 of the TFR (July 2019), the third-year forecasting model was excluded from economic appraisal of the scheme.

In accordance with TAG Unit A1.1 (Paragraph 2.1.1), the economic assessment period should extend to 60 years after the scheme Opening Year. Therefore, the economic assessment was carried out up to a future year of 2081.

2.5 Discounting of Benefits

Costs and benefits occur in different years throughout the assessment period, for example the construction costs occur before the scheme opens, whilst the benefits occur in the 60 years afterwards.

In addition, it is considered that benefits that accrue now are considered to be more valuable than those that accrue further into the future.

Given the above, to compare benefits and costs it is essential that they are all converted to a common base and a common value (known as the Present Value Year).

The process used is called discounting and the Present Value Year is currently 2010.

Discounting is undertaken internally within the computer programs mentioned above, using the standard DfT discount rates of 3.5% per year for the first 30 years of appraisal and 3.0% per year thereafter.

Costs can also be in different price bases. In order to enable comparisons to be made between such costs they need to be adjusted so that they are all in a common price base.

The combination of having costs and benefits in a standard price base and discounted to a common year means that all result costs and benefits are in 2010 prices, discounted to 2010 (unless explicitly stated).

The unit of account must also be consistent between costs and benefits in order to allow comparison between the two. There are two different units of accounts:

- Market price unit of account – this refers to the prices paid by consumers for goods and services and therefore includes indirect taxation (e.g. VAT); and
- Factor cost unit of account – this excludes indirect taxation. Prices paid by Government bodies are usually quoted in the factor cost unit of account as any tax paid is recovered by the Government and is therefore ignored.

While scheme benefits are calculated in market prices, scheme costs are usually quoted as factor costs.

The scheme costs must therefore be adjusted to market prices for economic assessment purposes – this is done within economic assessment software.

2.6 Standards

The economic assessment has been undertaken in accordance with the following Transport Analysis Guidance (TAG):

- TAG Unit A1.1: Cost Benefit Analysis
- TAG Unit A1.2: Scheme Costs
- TAG Unit A1.3: User and Provider Impacts
- TAG Unit A3: Environmental Impact Appraisal

- TAG Unit A4.1: Social Impact Appraisal

3. Traffic Modelling Inputs for Economic Assessment

3.1 Introduction

The majority of the inputs to economic assessment (such as future traffic flows, journey times and journey distances) are obtained from the improved Central Lancashire Highway Transport Model (CLHTM) for the purpose of the A582 SRWD Strategic Outline Business Case and used the latest forecasting methods as detailed in TFR (July 2019) to estimate future year traffic demand.

This chapter provides a summary of the traffic modelling that has been used as the basis of this economic assessment.

3.2 Modelled Area

The study area of the CLHTM extends over a wide area, modelled in three degrees of detail outlined below and in Figure 3.1:

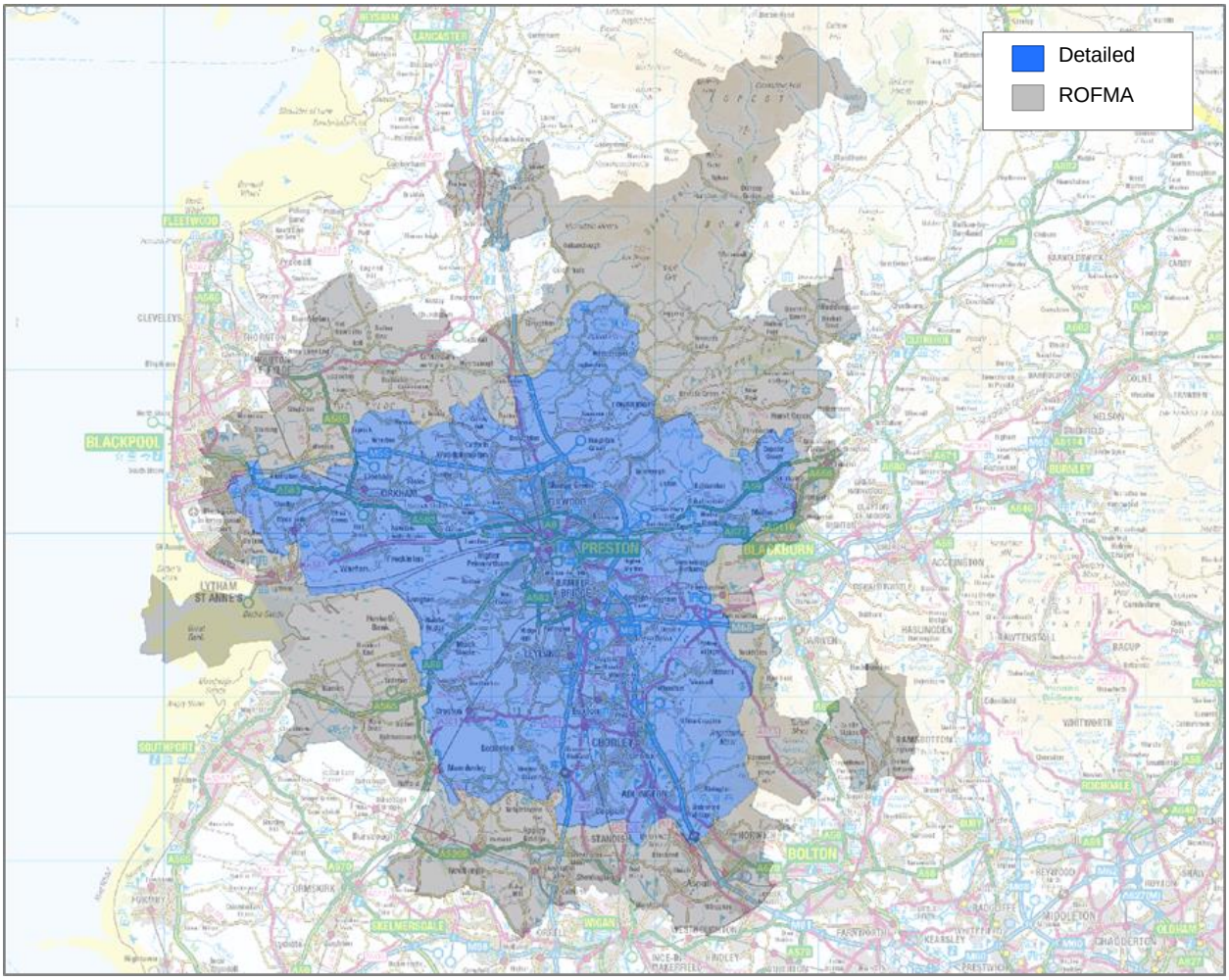


Figure 3.1: Model Network Structure

The full modelled area comprises the detailed area and the rest of fully modelled area (ROFMA) and the external area includes the rest of Great Britain.

3.3 Modelled Years, User Classes and Time Periods

The traffic model derived future year traffic flows both with and without the scheme in place for the Opening Year (2024) and the Design Year (2037).

Following TAG guidance, the traffic model splits traffic flows into different vehicle categories and different journey purposes for each modelled year. The future year matrices consist of five 'User Classes':

- User Class 1: Car – Commute
- User Class 2: Car – Employers Business
- User Class 3: Car – Other (Leisure, Education etc.)
- User Class 4: Light Goods Vehicles (LGVs)
- User Class 5: Heavy Goods Vehicles (HGVs)

The traffic model uses the following time periods:

- AM weekday peak (08:00 - 09:00)
- Inter-peak (IP) (an average weekday hour 10:00 - 16:00)
- PM weekday peak (17:00 - 18:00)

3.4 Forecast Scenario

The economic assessment of the A582 SRWD scheme is based on the "most likely" traffic forecast scenario known as Core Scenario. It has been produced in line with WebTAG guidance and does not include trips associated with the scheme dependent development. More details on the Core forecasting scenario can be found in the TFR (July 2019).

Throughout this report the Core Scenario without scheme and with scheme situations are referred to as Do Minimum and Do Something scenarios respectively.

The outputs from post Variable Demand Model runs have been used to undertake the economic assessment of the A582 SRWD.

4. Estimation of Costs

4.1 Introduction

The derivation of scheme costs is a crucial part of the scheme appraisal. Economic assessment considers both the actual cost of the scheme, together with any changes in the capital cost of maintenance in future years.

The costs used in scheme appraisal differ from the outturn costs used for funding decisions. Costs for scheme appraisal are adjusted to the DfT's standard present value year for appraisal (2010) to allow direct comparison with the monetised benefits and the costs are in calendar years. Scheme costs used for funding submissions are the outturn costs in the expected years of expenditure and are in financial years. The derivation of scheme costs for use in appraisal is illustrated in Figure 4.1.

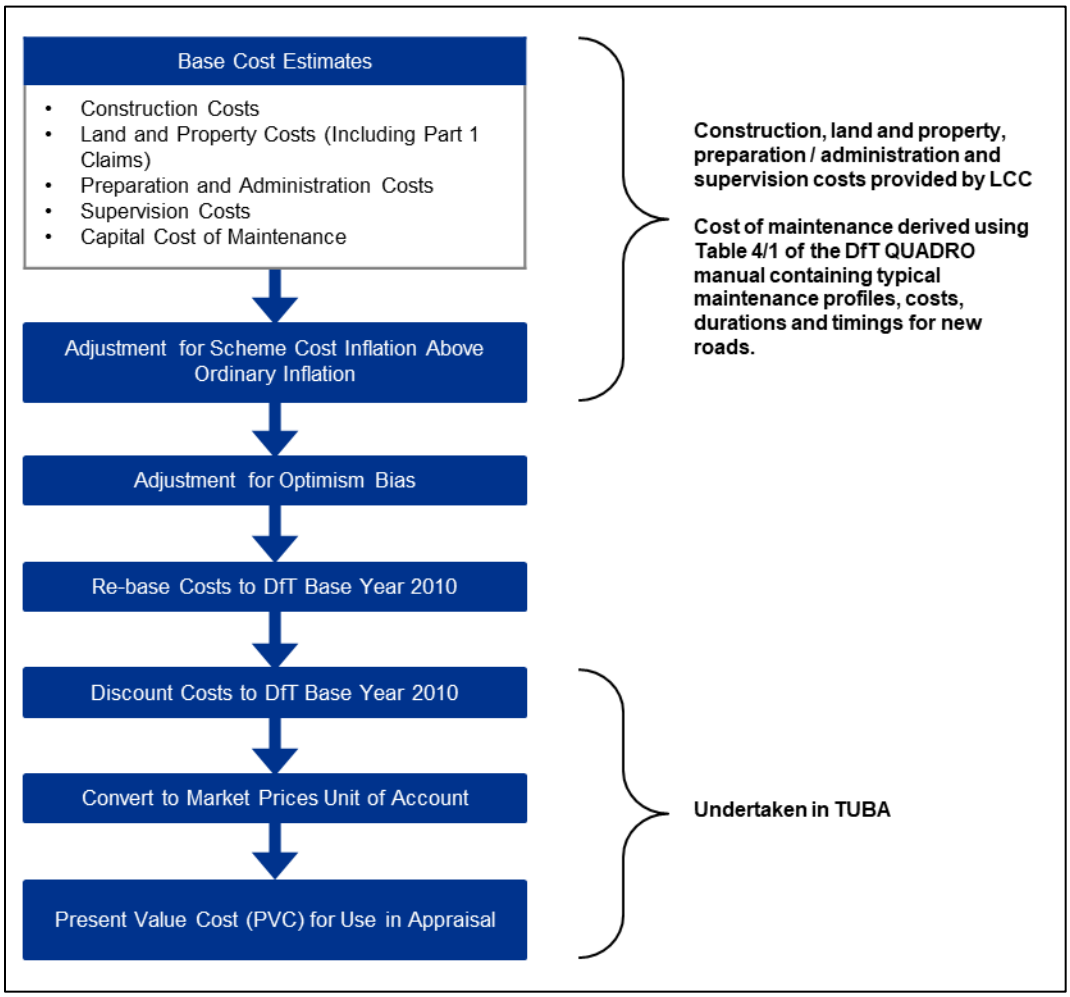


Figure 4.1: Estimation of Costs for Scheme Appraisal

4.2 Scheme Costs

Base cost estimates for construction, land / property, preparation / administration and supervision, including adjustment for risk have been provided by Lancashire County Council (LCC) and are presented in Appendix A.

The base cost estimates met the following criteria:

- Construction costs are based on the latest scheme design and from similar previous schemes
- Expenditure in calendar years
- Exclude both recoverable and non-recoverable VAT
- Exclude any costs that are present in both the Do-Minimum and the Do-Something scenarios

To ensure that only the costs which will be incurred after the economic appraisal, the costs which have been incurred to date were excluded from the total scheme costs for VfM assessment. These costs include the preparation of Outline Business Case.

The cost estimates were prepared in 2019 prices and then inflated to outturn costs (i.e. expected costs in the actual years of expenditure). These costs were then rebased to 2010 prices using the GDP-deflator series as published in the May 2019 WebTAG Data-book.

To ensure that the scheme costs account for real changes above or below general inflation in the economics modelling, a further adjustment was applied based on the conservative assumption of 5.5% per annum for construction related cost.

Lastly, Optimism Bias adjustments have been made. Optimism Bias is the tendency for scheme appraisers to be overly optimistic about key parameters including scheme costs and benefits. An uplift to the scheme costs used in the economic appraisal is applied to account for this bias. For the purposes of this economic assessment and as recommended in WebTAG, a 44% Optimism Bias adjustment was applied to the scheme cost.

Table 4.1 summarises the adjustment made to the base cost for the purpose of economic appraisal.

Table 4.1: Scheme Cost Adjustment Breakdown (in 2019 prices, undiscounted)

Scheme Cost Breakdown	Preparation Costs	Land Purchase	Construction Costs	Supervision Costs
Base Cost	£5.8m	£2.2m	£42.0m	£2.5m
Inflation	£0.2m	£0.7m	£7.4m	£0.5m
Optimism Bias (15%)	£2.6m	£1.3m	£21.7m	£1.3m
Total	£8.6m	£4.3m	£71.1m	£4.3m

4.3 Maintenance Costs

The capital cost of maintenance is the cost of people, machinery and materials required to maintain the new highway assets.

When the scheme is in place, the A582 will require additional maintenance due to the additional road surface to maintain. The maintenance cost estimate has been produced using Table 4/1 of the QUADRO manual 2017 (DMRB Volume 14 Sec 1 Part 2 Chapter 4) containing typical maintenance profiles, costs, durations and timings for new roads.

Similar to scheme costs an Optimism Bias adjustment of 44% has been made to maintenance costs.

The cost of maintenance in Do Minimum and Do Something scenarios have been estimated for the additional road surface on A582 between A6 roundabout and Broad Oak Lane roundabout. The summary of maintenance cost is shown in Table 4.2. The detailed profile of maintenance costs used is presented in Appendix D.

Table 4.2: Maintenance cost over 60 years (in 2010 prices, undiscounted)

Category	Scheme Cost
Do Something	£16.2m
Do Minimum	£7.7m

The maintenance cost of the A582 SRWD is likely to be partially offset by a reduction in the maintenance required on the local road network such as B5254 due to a reduction in traffic. However, this effect is likely to be insignificant and has not been included in the analysis.

4.4 Present Value of Costs

The costs above were entered into TUBA to be summed over the 60-year appraisal period, converted to 2010 prices, discounted to 2010, and converted to the market price unit of account. A summary of the Present Value of Costs (PVC) output by TUBA is provided in Table 4.3.

Table 4.3: Present Value of Costs (2010 prices, discounted to 2010)

Category	Discounted Cost
Scheme Costs	£59.1m
Additional Cost of Maintenance	£1.1m
Total PVC	£60.3m

4.5 Public Accounts (PA) Table

A summary of the scheme costs is reported in a standard table known as the Public Accounts (PA) table. The PA table for this scheme is presented in Appendix C.

Note that the PA table includes the effect of the scheme on indirect tax revenues, which is reported as -£4.0m.

5. Estimation of Benefits

5.1 Introduction

As discussed previously the economic assessment of the A582 SRWD was driven by the objectives of the scheme which include standard transport scheme objectives (improving journey times, journey time reliability, safety etc.) as well as providing wider economic benefits for Central Lancashire. This chapter provides a detailed description of how the identified transport impacts of the A582 SRWD have been estimated.

The different types of benefit being assessed for the scheme which can be monetised and are included within the calculation of the Initial Benefit to Cost Ratio (BCR) are summarised in Figure 5.1 and detailed in sections 5.2, 5.3, 5.4, 5.5 and 5.6.

The rest of the elements which contribute to the VfM of the scheme but are not part of the BCR are detailed in sections 5.7 and 5.8.

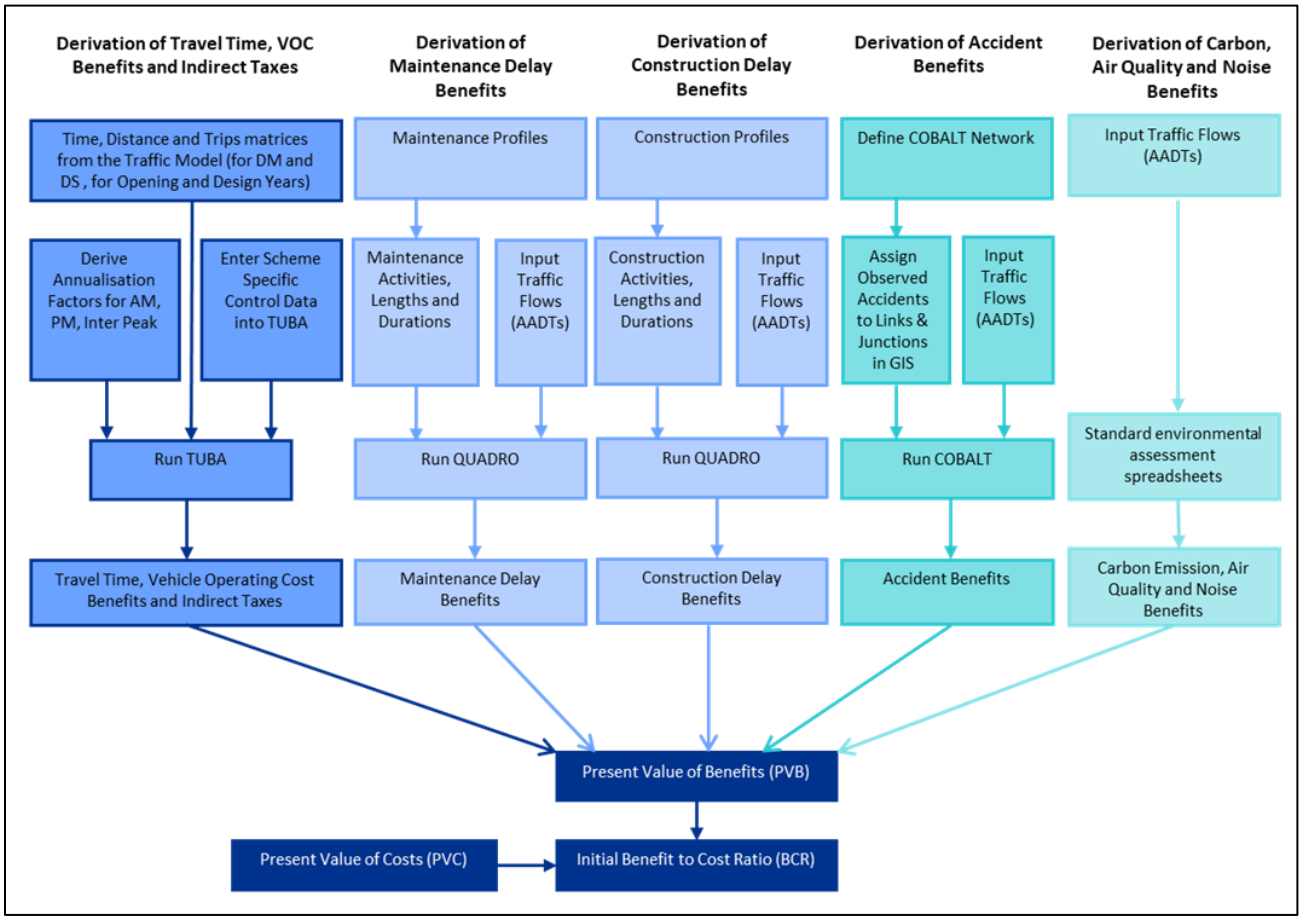


Figure 5.1: The Process for the Derivation of Benefits

5.2 Transport Economic Efficiency Benefits

The Transport Economic Efficiency (TEE) benefits consist of three key components, set out below:

- Travel time and Vehicle Operating Costs (VOC) benefits as a result of the scheme
- Travel time and VOC disbenefits as a result of construction activities
- Travel time and VOC disbenefits as a result of maintenance activities

Traditionally travel time and VOC benefits as a result of the scheme are expected to constitute by far the largest proportion of the scheme benefits used in BCR calculation.

The TEE benefits because of the scheme are calculated with the use of TUBA. Along with travel time and VOC TUBA considers other Business and Consumer impacts (e.g. user charges), the private sector provider revenues and costs, and the Indirect Taxes elements of the WebTAG requirements. In the absence of tolled roads, the A582 SRWD is not expected to have any impact on user charges or private sector provider revenues. The assessment of changes in Indirect Tax is discussed in the remainder of this Chapter.

Travel time saving benefits are derived within TUBA by comparing the overall travel times in the Do Minimum scenario with travel times in the Do Something scenario. It will typically take a shorter time to travel through the study area when the scheme is implemented, and these time savings are converted into a monetary value.

TUBA also calculates VOC changes which occur due to changes in costs associated with such items as fuel, maintenance, and wear and tear. These occur due to changes in speed and distance when the scheme is implemented and can include both positive and negative values depending upon the scheme's impact on traffic flows and routing.

For the appraisal of travel time and VOC benefits, matrices (tables of trips, travel times and distances between all origins and destinations) from the traffic model are entered into TUBA, along with other scheme specific data.

TUBA assesses travel time savings over the entire modelled area and then applies monetary values (known as Values of Time (VOT)) to derive the monetary benefits of those time savings.

TAG guidance VOT parameters and forecast changes in their values over future years are included in the standard TUBA economic file (as used within TUBA version 1.9.12).

In accordance with best practice, the results of the TUBA assessments have been checked at a sector level (as it would be difficult to do this assessment at a zonal level).

5.2.1 Annualisation Factors

In accordance with the TUBA guidance, annualisation factors are required to expand the daily modelled time periods to those that occur within a full year.

The model has three time periods that represent single hours for a typical average, neutral month weekday:

- AM Peak: 0800 – 0900
- Inter-peak (Average hour): 1000 – 1600
- PM Peak: 1700 – 1800

To produce a robust assessment, the annualisation factors need to factor modelled hours to be representative of those periods with similar flows and journey purposes.

The annualisation factors used in this assessment have been adopted from those used for the economic appraisal of Preston Western Distributor. It was assumed that these values are still applicable because of the proximity of the two schemes and the similarity of travel pattern within the area.

The average weekday traffic flow profile was examined to identify time intervals which would be included in the AM, PM and Inter-peak time slices for the TUBA analysis. The criterion was set up so that if the time interval had a flow within 10% of the modelled peak hour flow it would be added to the modelled peak to derive the annualisation factor.

The analysis of the traffic flow profile at the permanent count sites showed that the AM and PM each contained 2 hours of traffic within 10% of the modelled peak hour flow. To best represent the modelled area, the AM and PM peak annualisation factors were taken as 506 (253 x 2). In addition, it was concluded that the traffic flow in AM between 09:00 and 10:00 and in PM between 18:00 and 19:00 were comparable with the inter-peak flow and therefore impacts of the scheme in those hours, referred to as AM and PM peak shoulders, could be estimated using travel demand and time and distance skims taken from the interpeak model.

The resultant annualisation factors are shown in Table 5.1. The average day flow profile is presented in Appendix E.

Table 5.1: TUBA Time Slices and Annualisation Factors

Time Slice	Time	Model Matrix Used	Hours	Days	Annualisation Factor
AM Peak	07:00 to 09:00	AM	2	253	506
IP Peak	10:00 to 16:00	Inter-peak	6	253	1518
PM Peak	16:00 to 18:00	PM	2	253	506
AM Peak Shoulder	09:00 to 10:00	Inter-peak	1	253	253
PM Peak Shoulder	18:00 to 19:00	Inter-peak	1	253	253

The weekday off-peak (19:00-07:00), weekends and Bank Holidays have been excluded from TUBA analysis. This is consistent with TAG guidance, which recommends not including benefits from non-modelled time periods.

Given that the A582 SRWD is not only expected to reduce congestion in peak hours but also provides a more reliable and faster route between a number of zones in uncongested situation the off-peak benefits for the scheme would be positive and therefore exclusion of off-peak and weekend benefits confirms a conservative estimate of the scheme benefits.

5.2.2 TUBA Input Parameters

The TUBA input for each assessment consists of a standard TUBA scheme file. The common parameters within the scheme files for all of the TUBA runs including sensitivity tests are shown in Table 5.2.

Table 5.2: TUBA Input Parameters

Parameter	Value
TUBA Version	1.9.12
First Year	2024
Horizon Year	2083
Modelled Years	2024 and 2037

Parameter	Value
Current Year	2019 (defines the first year in which the discount rate is applied)
Time Slices	5 time slices as shown in Table 5.1
Scheme Mode	Road
1st Construction Year	2021
Opening Year	2024
Do Something Costs	As shown in Table 4.1 and Table 4.2
Price	Factor Prices
GDP Deflator	114.49 (deflation factor for 2018 applied to all costs except Maintenance which is in 2010 prices) – based on May 2019 TAG Databook
Do Something Scheme Cost Profile	As shown in Appendix B
User Classes	As shown in section 3.3
Input Matrices	Time, Distance and Trip skims

The TUBA input file is presented in Appendix F.

5.2.3 User Classes and Matrix Input

The forecast model matrices have been obtained from the CLHTM forecast model. The following matrices were taken from the model for each future year, vehicle type, journey purpose and time period:

- Trip matrices (in passenger car units)
- Time matrices (in seconds)
- Distance matrices (in metres)

Appropriate factors were applied in TUBA input file to convert the trip, time and distance matrices to vehicles (only to HGV user class), hours, and kilometre, respectively. The LGV trip matrices have been split into Commuting/Other trips which account for 12% and Business trips which account for 88% of LGV trips.

As the CLHTM model does not differentiate between OGV1 and OGV2, the HGV trip matrices have been split by 47% and 53% respectively, based on national average splits from COBA Manual Part 4 Chapter 8 (Table 8/1. Annual Average Category Proportions by Class of Road).

5.2.4 Assessment of TUBA Warnings

TUBA performs a series of checks on the input data to assess whether the input appears sensible. The checks generally involve comparing the Do Minimum and Do Something scenarios input time and distance skim matrices to observe any large differences between values within the matrices. If the ratio of the values is above a specified threshold, TUBA displays a warning.

The warning messages were closely checked to ensure that the results were logical. It was decided that warnings affecting a very small demand (less than 5 trips) would not need to be investigated as they are unlikely to have a material impact on the results. Therefore, they were filtered out before the analysis was undertaken.

Table 5.3 shows the warnings affecting more than 5 trips and their analysis. It should be noted that none of them was a serious warning, confirming the robustness of the forecasting models. The TUBA output file for the Core scenario is available upon request.

Table 5.3: TUBA Warnings

Warning type	Origin	Destination	Time period	Vehicle type	Purpose	Year	Number of trips	Comment
Ratio of DM to DS travel time lower than the limit	523	244	AM	Car	Commuting	2037	10.3	These three movements experience higher travel time with scheme in place due to severance of Croston Rd south and signalising the junction with the northern arm. These are identified local trips that are expected to experience longer journey times with scheme in place.
	247	244	AM	Car	Commuting	2037	10.0	
	57	244	AM	Car	Commuting	2037	10.0	
Ratio of DM to DS travel time higher than the limit	244	243	PM	Car	Other	2037	7.7	With Croston Road junction being signalised, more capacity is provided at this junction which results in shift of traffic from Centurion Way junction with Stanifield Lane and therefore relieving delays at this junction and therefore shorter journey times expected for this movement.
					Commuting	2037	12.0	
Ratio of DM and DS travel distance is lower than the limit	19	552	All	Car	Business and Commuting	2024 & 2037	46.0	With more capacity provided with scheme in place, the trips from Penwortham will use A582 Southbound to travel longer distance to reach Red Scar business park.
	419	528	AM	Car	Commuting	2024	12.2	With more capacity provided with scheme in place, the traffic from south west of Preston will shift from B5254 on to A582 southbound, travelling longer distance to reach Blackburn.
	463	34	AM	LGV	All	2037	15.3	With faster travel times on A582, the trips from eastern edge of Preston use the motorway links to access A582 and reach New Longton.
	37	261	All	Car	Other	2024 & 2037	35.6	This movement is expected to travel longer distance from Capital Trade Park on A582 to reach the zones near Chain House Lane junction, switching routes from through Lostock Hall.
	528	389	PM	Car	Other	2024	7.3	With scheme in place and more capacity available on A582, the trips from Blackburn to Riversway are travelling further distances on A582 switching from A6 and B5254.
Ratio of DM and DS travel distance is higher than the limit	381	232	AM	Car	Commuting	2024	7.8	The movements from north west of Preston will take the shorter route through A582 instead of M6 to reach the zones in Leyland.
	477	237	AM	LGV	All	2037	143.9	With more traffic shifting to A582 with scheme in place, more capacity is available movements on A6 from zones in Preston to zones in Leyland. These trips are switching routes from M6.
	528	420	IP	Car	Other	2037	21.7	With more traffic using the scheme and some congestion is relieved from Preston, some traffic will use the spared capacity and travel shorter distances through Preston to zones near the Liverpool Rd crossing.

5.3 Construction and Maintenance Delays

5.3.1 Construction Delays

During the construction of the scheme, delays will be experienced by road users. These delays can be kept to a minimum by effective traffic management but are unlikely to be removed altogether. This results in travel time and VOC disbenefits on the existing network that should be considered as part of the TEE assessments.

QUADRO is the industry-standard software used to derive the construction and maintenance delay elements of the TEE benefits of a scheme.

Assumptions have been made on the traffic management by looking at the previous similar schemes and confirmed by LCC. Table 5.4 provides the traffic management activity assumptions during construction. The duration of work is assumed to be concurrent where possible. These have been coded into QUADRO for each of the construction activities. QUADRO then calculates the impact upon travel times and applies VOT to derive the monetary value of the changes in travel times.

It is expected that in the next stages of the scheme, more information will be provided by contractors for traffic management activities during construction.

Table 5.4: Construction Traffic Management Systems

Description	Site Length (km.)	Traffic Management Type	Usual Speed Limit (kph)	Year of work	Duration
Dualling of A582					
Narrow widening of A6 - B5254	0.6	Contra-flow with one lane open each direction	113	2021	4 weeks
Extra lane on northbound exit arm from Terminus Junction	0.6	Contra-flow with one lane open each direction	80	2021	8 weeks
Dualling of A582 between B5254 and Croston Rd	1.5	Narrow lanes all day and reduced speed	96	2022	36 weeks
Dualling of A582 between Croston Rd and B5254	0.75	Narrow lanes all day and reduced speed	96	2022	36 weeks
Dualling of A582 between Flensburg Way and Chain House Ln	1.0	Narrow lanes all day and reduced speed	80	2022 & 2023	36 weeks
Dualling of A582 between Chain House Ln and Pope Ln	1.4	Narrow lanes all day and reduced speed	80	2023	36 weeks
Dualling of A582 between Pope Ln and Millbrook Way	0.4	Narrow lanes all day and reduced speed	80	2023 & 2024	24 weeks
Junctions Work					
Multiple carriageway closures on A582	Various	Diversion route in place. Mainly B5254	Various	2023	Weekend closures
Multiple lane narrowing at Penwortham Triangle	Various	Reduction in lane width and number of lanes	Various	2024	Weekend closures

Preparation work commences in October 2021 and construction is due for completion in March 2024. Traffic flows for the calculation of construction delay disbenefits have been taken from the CLHTM 2022 model.

The monetary values of the disbenefits, based in 2010 prices and discounted to 2010 within QUADRO, are included within the AMCB table and the BCR as well as the TEE table.

5.3.2 Maintenance Delays

Delays will be experienced by road users during periods of maintenance in the future situations both with and without the scheme. With the A582 SRWD in place, it is likely that less traffic will be affected by the delays due to maintenance, because of the availability of the additional carriageway.

Also, less maintenance is required on a new road (i.e. the “maintenance holiday” effect) and therefore the present value of cost of delays due to maintenance of the scheme will be reduced by the effect of discounting.

For the assessment of the delays during maintenance of the scheme, the A582 has been split into several sections. The maintenance delay is calculated separately for each section in each of the Do Minimum and Do Something scenarios. Table 5.5 provides a summary of the preferred traffic management systems and roadwork assumptions as confirmed by LCC for the maintenance of each section.

Table 5.5: Maintenance Traffic Management Systems

Description	Scenario	Site Length (km.)	Traffic Management Type	Usual Speed Limit (kph)	Year of work	Duration (Days)
Road between M65 Terminus Junction and A6 Roundabout NB	Do Something	0.3	NB road reduced to a single lane carriageway	80	2035 2046 2056 2066 2076	6 7 12 7 7
A582 between A6 and B5254	Do Something	0.6	Contra-flow traffic on a carriageway	113	2035 2046 2056 2066 2076	6 7 12 7 7
A582 between B5254 and Croston Rd	Do Something	1.5	Contra-flow traffic on a carriageway	96	2035 2046 2056 2066 2076	6 7 12 7 7
A582 between Croston Rd and B5254	Do Something	0.75	Contra-flow traffic on a carriageway	96	2035 2046 2056 2066 2076	6 7 12 7 7
A582 between Flensburg Way and Chain House Ln	Do Something	1.0	Contra-flow traffic on a carriageway	80	2035 2046 2056 2066 2076	6 7 12 7 7
A582 between Chain House Ln and Pope Ln	Do Something	1.4	Contra-flow traffic on a carriageway	80	2035 2046 2056 2066 2076	6 7 12 7 7
A582 between Pope Ln and Millbrook Way	Do Something	0.4	Contra-flow traffic on a carriageway	80	2035 2046 2056 2066 2076	6 7 12 7 7
Road between M65 Terminus Junction and A6 Roundabout	Do Minimum	0.3	Contra-flow traffic on a carriageway	80	2024 2035 2046 2056 2066 2076	12 7 7 12 7 7
A582 between A6 and B5254	Do Minimum	0.6	Contra-flow traffic on a carriageway	113	2024 2035 2046	12 7 7

					2056 2066 2076	12 7 7
A582 between B5254 and Croston Rd	Do Minimum	1.5	Diversion route, via B5254	113	2024 2035 2046 2056 2066 2076	12 4 12 4 12 4
A582 between Croston Rd and B5254	Do Minimum	0.75	Diversion route, via B5254	96	2024 2035 2046 2056 2066 2076	12 4 12 4 12 4
A582 between Flensburg Way and Chain House Ln	Do Minimum	1.0	Diversion route, via B5254	80	2024 2035 2046 2056 2066 2076	12 4 12 4 12 4
A582 between Chain House Ln and Pope Ln	Do Minimum	1.4	Diversion route, via B5254	80	2024 2035 2046 2056 2066 2076	12 4 12 4 12 4
A582 between Pope Ln and Millbrook Way	Do Minimum	0.4	Diversion route, via B5254	80	2024 2035 2046 2056 2066 2076	15 6 15 6 15 12

Forecast year flows are taken from the from the CLHTM 2022 and 2037 models.

The QUADRO results are summed separately for the Do Minimum and Do Something scenarios, and the difference between the two is the maintenance benefit/disbenefit.

QUADRO produces outputs in terms of costs i.e. negative PVB. The results are reported in Chapter 6. The results are also included within the AMCB table and the BCR, as well as the TEE table.

5.4 Changes in Indirect Tax Revenues

Indirect taxes relate to the taxation levied on goods and services and therefore include excises, duties and VAT. TUBA calculates the changes in Indirect Taxes as a result of changes in speed and distance. These changes affect the amount of fuel being used and therefore affect the amount of taxes the Government receives.

According to TAG guidance, changes in indirect tax revenues are included as part of the Present Value of Benefits (PVB). Therefore, change in Indirect Taxes, as a monetary value in 2010 prices discounted to 2010, is included within the AMCB and PA tables and form part of the BCR.

5.5 Accident Benefits

In line with WebTAG the DfT COBA-LT software (version 2013.2) with parameter file 2018.1 (May 2018) was used to derive the accident benefits of the scheme.

COBA-LT calculates numbers of accidents in Do Minimum and Do Something scenarios and converts them into monetary values by applying cost of accident prevention. The difference in cost of accidents between the Do

Minimum and Do Something scenarios forms the accident benefit of the scheme. The benefits are discounted to 2010 and summed over the 60-year assessment period.

COBA-LT uses nodes and links to represent the Base, Do Minimum and Do Something highway networks.

The COBA-LT study area for the A582 SRWD was defined in such a way that it would include all roads where a significant change in flow between Do Minimum and Do Something scenarios is predicted (taken to be a change in flow of 10% or more). There is no clear guidance on how to identify a study area for COBA-LT analysis. Therefore the 10% criterion was used as it is consistent with how WebTAG defines significant change in traffic flow for distributional impact assessment of accident benefits.

The extent of the COBA-LT network is demonstrated in Figure 5.2.

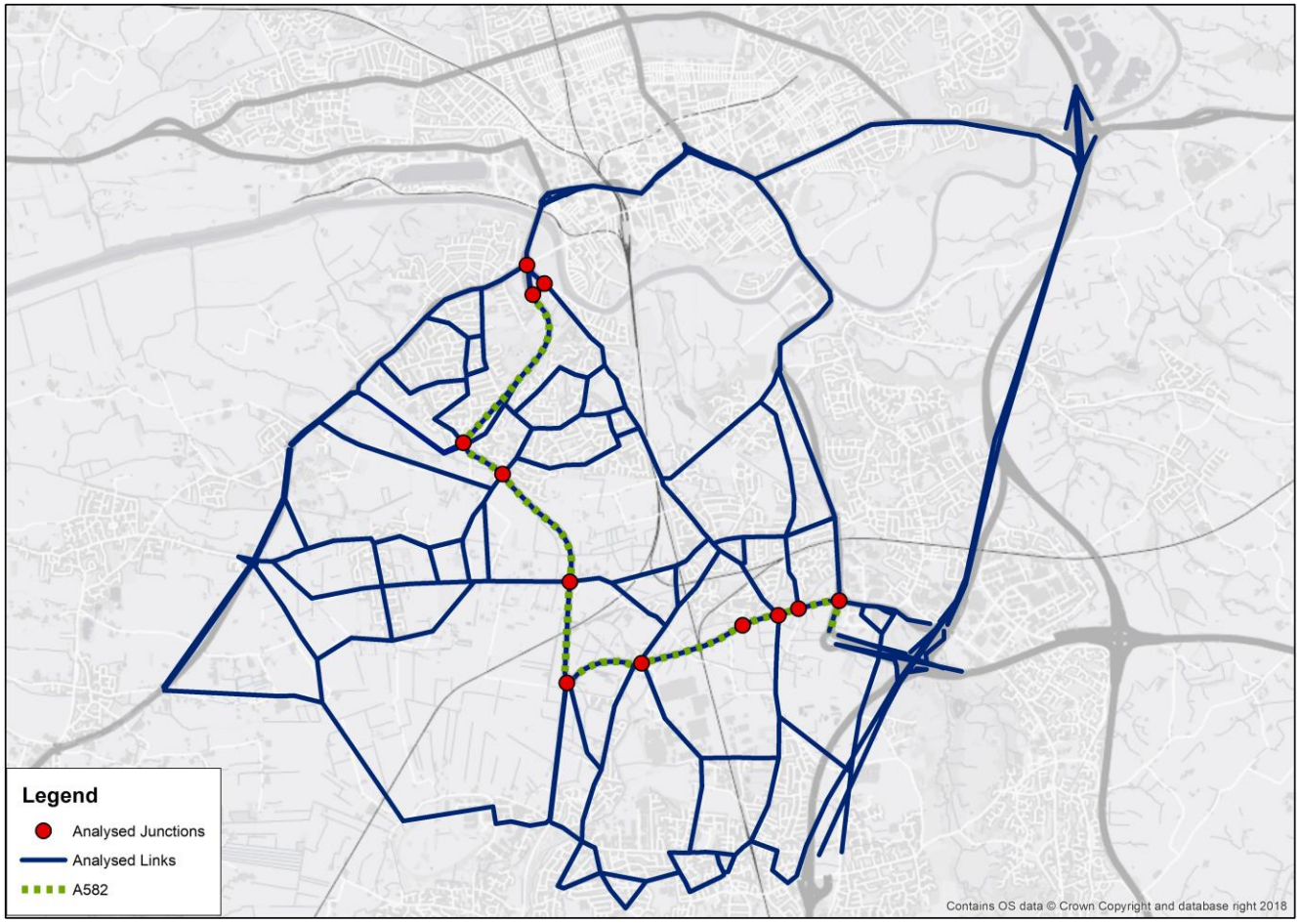


Figure 5.2: COBA-LT Network

Table 5.6 provides the total number of junctions and links assessed in Do Minimum and Do Something scenarios as part of accident assessment.

Table 5.6: Number of Junctions and Links Assessed in COBA-LT

Element	Do Minimum	Do Something
Number of Junctions	12	12

Element	Do Minimum	Do Something
Number of Links in Separate Mode	24	24
Number of Links in Combined Mode	405	405

Coding of links and nodes was carried out in accordance with the COBA-LT User Manual and used the CLHTM model as its basis.

Link and junction parameters including speed limits, distances, road class and junction type were obtained from accident data and Google Maps Street View.

COBA-LT calculates the number of accidents from either default (national average) or observed (local) accident rates. The majority of observed accident rates were calculated from Personal Injury Accident (PIA) data for the latest available complete five-year period (2014-2018). However, where a junction has been improved within the last five years, only PIA data for the years after scheme completion date has been used. Appendix J shows the location of PIA within the COBA-LT study area.

The PIA data was plotted and assigned to the COBA-LT links and junctions in the 2013 Base year scenario to derive the observed accident rates. For the links and junctions that represented the Scheme or parts of the forecast network which are not present in the Base year scenario (e.g. upgraded A582, Croston Road Signalised Junction, Sherdley Road Signalised junction etc.), default accident rates were used.

Where a link had no accidents over the five-year period, either 0.5 accident per five-year assumption was applied or the link was joined with an adjacent link with at least one accident over the five-year period provided that type, speed and AADT flow is the same for the amalgamated links.

The similar principle was applied to any links with unusually high observed accident rates (> 3 PIAs per million veh-km). Any link with an unusually high accident rate was joined with an adjacent link if it satisfied the criteria above, or else the default accident rate was used.

The traffic flows used for accident analysis are the modelled flows derived from the Base Year and Forecast CLHTM models and are consistent with all other elements of economic analysis contained within this report.

The warning messages within the output files were closely checked to understand their impact on the results of the COBA-LT analysis. Further checks were carried out to ensure that the inputs for observed accidents rates calculation were correct and the resulting rates were representative of the actual situation on the ground.

COBA-LT outputs the number of accidents and casualties, and their associated costs, discounted over the 60-year assessment period for the future situations with and without the scheme, together with the net changes in accidents and casualties.

The results are shown in Chapter 6. The results are also included within the AMCB table and the BCR, but not the TEE table.

5.6 Change in Greenhouse Gas Emissions, Noise and Air Quality

Changes in traffic flows caused by the introduction of the scheme result in changes in greenhouse gas emissions from vehicles, depending on changes in flows, speeds and distance travelled.

The standard Greenhouse Gases Spreadsheet from TAG Unit A3 has been used to calculate the total carbon dioxide emissions (tonnes) for the life of the scheme.

The spreadsheet outputs information on carbon dioxide emissions per year. Benefits are output in tonnes and as a monetary value (PVB).

The standard Air Quality Worksheet from TAG Unit A3 has been used to calculate the change in Air Quality for the life of the scheme. The spreadsheet outputs information on PM10 (Particulate Matter < 10µm) concentrations and NOx (Nitrogen oxides) in tonnes per year. Benefits are also output as a monetary value (PVB).

Because the scheme is currently at early stages, the Air Quality analysis was undertaken at a regional level and therefore the impact of the scheme on receptors is not assessed. For this reason, the air quality analysis does not monetise any change in PM10 emissions.

Changes in traffic flows can also result in changes in noise, depending on whether properties are located adjacent to affected roads or not. The standard Noise Spreadsheet from TAG Unit A3 has been used to calculate the change in noise levels during the life of the scheme, the change in numbers of people “annoyed” and the monetary value of those changes (PVB).

It should be noted that the environmental impacts, in line with the Environmental Statement of the scheme has been undertaken with an Opening Year of the of 2022. With scheme completion year of 2024, the assessed impacts are not expected to be significantly different. The environmental impacts of the scheme at Outline Business Case stage will be undertaken with the Opening Year of 2024.

The monetary values of the results are reported in Chapter 6 of this report.

The results are also included within the AMCB table and the BCR, but not the TEE table.

5.7 Journey Time Reliability Benefits

The term reliability is referred in TAG Unit A1.3 guidance as variation in journey times that individuals are unable to predict. Such variation could come from recurring congestion at the same period each day (day-to-day variability, or DTDV) or from non-recurring events, such as traffic collisions. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects which travellers are assumed to be aware of.

The reliability benefits of the scheme can be captured and monetised, however they are not included in the scheme AMCB table and will be included in the adjusted BCR.

Once the A582 is upgraded to a dual carriageway, it is assumed that road users on A582 between Golden Way and Stanifield Lane will experience the level of reliability currently experienced on the dual carriageway section between Broad Oak Lane and Penwortham Triangle. This section is adjacent to the scheme, and hence experiences broadly similar traffic flows and seasonal variation.

For each section, variability in journey time was measured across a sample of journey time observations taken from the Teltrac Navman GPS data.

It is important to distinguish between unpredictable and predictable variation in journey times. To ensure that the analysis only captures unpredictable variation, observed journey times have been collected across specific times of the day (AM, Inter-peak and PM periods), weekdays (Monday to Friday) and neutral months of the year. November 2018 was chosen as a representative because the Golden Way construction was completed in October 2018.

Observed journey times were used to calculate the variance of the journey times on each section as shown in Figure 5.3.

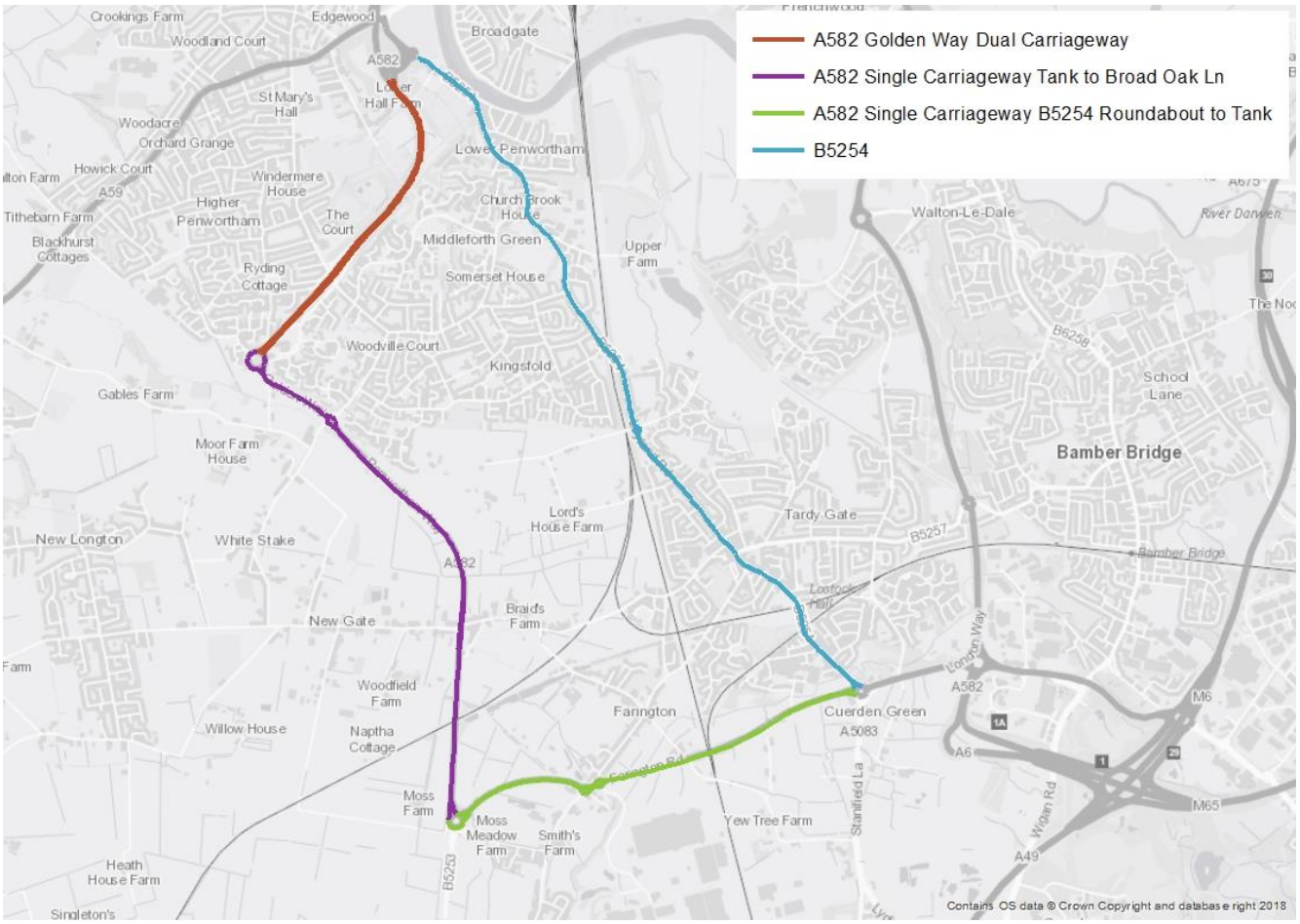


Figure 5.3: Journey Time Reliability Sections

The traffic that use any single carriageway sections of A582 in Do Minimum, is assumed that will experience a more reliable journey in Do Something scenario. The trips that also switch from B5254 to use A582 will also benefit from a more reliable journey.

It is understood that journey time reliability deteriorates when the traffic increases and the traffic on A582 is forecast to increase. This approach for assessing the journey time reliability of the scheme is conservative with the assumption that the journey time reliability of the single carriageway section remains the same over the years of appraisal period.

To assess the journey time reliability benefits, the standard deviation of the observed journey times has been calculated and compared between Do Minimum and Do Something scenarios. The difference has been monetised using the values of time and the reliability ratio of 0.4 in line with WebTAG unit A1.3. The reliability ratio is defined as the ratio of the value of a one-minute change in journey time variability to the value of a one-minute change in journey times.

The flows from the CLHTM forecast models have been used to monetise the reliability benefits for all flows in each modelling year. The benefits have been annualised using the annualisation factors as described in section 5.2.1, discounted to 2010 and summed over the 60-year assessment period.

The results of the journey time reliability benefits are provided in Chapter 6.

5.8 Wider Economic Benefits

The previous sections of this report described the assessment of user benefits, including economic, environmental and social impacts. The results of this analysis are reported in the Economic Case and inform the value for money assessment of the scheme.

Under a well-defined set of circumstances, these user benefits will capture the entire welfare impact of a transport investment. However, as described the scheme's Economic Narrative (Appendix H), several market failures have been identified which will lead to additional impacts that should be captured.

The following additional impacts are expected to occur:

- Productivity improvements due to agglomeration impacts ('static clustering')
- Labour supply impacts
- Increased business output ('output change in imperfectly competitive markets')
- Facilitating Investment ('dependent development')

The first three of these impacts listed above are known as "wider impacts" and will be discussed in this chapter. The impact from facilitating investment ('dependent development') is described in section 5.9.

5.8.1 Productivity and Labour Supply Impacts – Assessment using WITA

The proposed scheme is expected to provide productivity benefits through an increase in agglomeration, as a reduction in travel costs effectively brings businesses and employees closer together. There is also expected to be an impact on the size of the labour market, as reductions in commuting costs due to the scheme results in some people moving into work who had previously considered the cost of travel too high.

Both impacts were assessed using the DfT's WITA software (Version 1.2 Be). Details of the methodology used are provided below. Results are provided in Chapter 6.

Model Area and Zoning System

A new zoning system was used within the WITA analysis, in order to reconcile the traffic model data (based on the model's zoning system) and economic data (at Local Authority District (LAD) level). The new WITA zone boundaries followed either the traffic model zone or LAD boundaries, whichever was larger. For the A582 assessment, in the core model area the WITA zones followed LAD boundaries as they were larger than the traffic model zone and outside the core model area the WITA zones followed the traffic model zone boundaries as they are larger than the LAD zones.

The Wider Impacts study area should be limited to the area in which the traffic model provides a good estimate of the generalised costs of travel. Agglomeration calculations are based on the idea of 'effective density', which is a measure of how well an area is connected to everywhere else. An incorrect estimation of the base generalised costs would lead to an incorrect base case level of effective density, and hence an incorrect estimation of the impact resulting from any changes in agglomeration caused by the transport intervention.

For this reason, it was necessary to extract WITA benefits for only a core area of the model, for which the number of trips and generalised cost of travel are modelled in sufficient detail. Although benefits were extracted for this core area only, WITA's calculations were based on inputs which cover the full traffic model area. This is to allow full estimates of effective density based on all trips to or from the core area to be made.

The chosen 'core area', included Local Authorities from Lancaster in the north to Bolton and Wigan in the south, and as far east as East Lancashire.

Use of Existing TUBA assessment

As discussed above, information on the cost and demand of travel input into WITA is based on the existing TUBA assessment. Demand, time and distance skims from the traffic model were prepared as part of the main TUBA assessment of the scheme, for each relevant user class and time period. The model skims were entered directly into WITA using the existing TUBA scheme parameter file. However, the following amendments were required:

- As per TAG Unit A2.1, freight movements were excluded from central estimates of Wider Impacts. Any reference to HGV/LGV demand or costs of travel were therefore removed from the TUBA scheme file. Similarly, any car "other" trips (i.e. not business or commuting trips) were excluded;
- The main TUBA assessment does not include data on public transport trips, or walking / cycling. Because Wider Impact assessments should consider all modes, the treatment of non-car modes is discussed below; and
- As the WITA software has not been updated for several years, it requires the use of a TUBA standard economics file from TUBA v1.7. The values within this file were updated to match those from the current version of TUBA (v1.9.12).

Non-Car Modes

The existing TUBA assessment does not include data on public transport trips, or walking / cycling. However, the guidance states that the assessments should consider all modes.

The required public transport (PT) and walking demand and cost skims were created as follows:

- Demand skims for both PT and walking were created based on factoring the car demand skims, whereby the Census 'Journey to Work' data was used to inform the level of PT & walking demand relative to car usage. These demand conversion factors were calculated at a zone-to-zone level (i.e. not a blanket factor across the entire demand). Any walking demand for trips over 5km in length was removed;
- PT time skims were assumed to be twice the corresponding travel time for cars;
- Walking time skims were calculated by assuming a fixed walking speed of 5kph; and
- Distance skims for both PT and walking were assumed to be the same as for cars.

24hr Commuting Matrix

As part of the calculation of labour market impacts, WITA requires a 24hr commuting Production/Attraction (PA) demand matrix. This was derived at Local Authority level based on 2001 Census 'Journey to Work Matrix' information. As recommended in WITA guidance, this matrix was factored up to be consistent with the employment data input elsewhere in WITA.

Employment and Economic Parameters

Most of the employment and economic data parameters were taken from the DfT's Wider Impacts Dataset, released in draft in May 2019.

For Local Authorities outside the 'core area', employment and economic parameters were taken from the previous Wider Impacts Dataset (Version 2.5 – July 2013). However, as no results are extracted from outside this core area, the use of this older dataset is not expected to have a significant impact on the results.

5.8.2 Output Change in Imperfectly Competitive Markets

As described in the Economic Narrative, market failures have been identified which indicate that the assumption of 'perfect competition' in terms of business output is untrue. This includes the fact that the scheme delivers significant benefits to freight, where a small number of large companies dominate the sector.

Because of these market failures, the additional output produced by firms as a result of decreased travel costs is not fully captured in the standard business user benefits calculation. An additional welfare impact is therefore calculated. The impact is estimated by applying a 10% uplift factor to the business and freight user benefits calculated in TUBA. The results of the uplift are shown in Chapter 6.

5.9 Dependent Development Benefits

One of the key objectives – and likely sources of benefits – of the scheme, is the fact it helps to unlock wider growth planned by in Lancashire.

Two particular developments were identified as being dependent on the scheme:

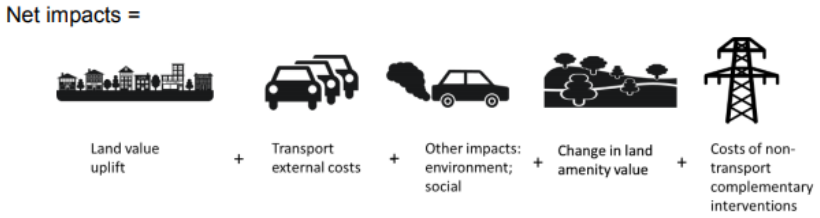
- "Pickerings Farm" – a residential development of 1,350 homes
- "Cuerden Strategic Site" – a large-scale employment development over 65 hectares

Both sites are identified in the City Deal as essential to unlocking the city region's economic growth potential, and both are reliant on future improvement of the transport network which will be provided by the City Deal schemes (one of which is A582 SRWD).

As these schemes are considered to be unable to proceed without the scheme in place, their impacts have been excluded from the core economic assessment described above. The user benefits described elsewhere in this economic case are based on the assumption that these developments do not come forward.

However, this means that a potentially significant benefit of the scheme is missing from its core economic assessment. To capture this benefit, a 'land value uplift' assessment was undertaken. This measures the increase in the value of the housing and employment land compared to its existing use, and uses this as a proxy for the economic benefits to society provided by the new development.

Full details of the land value uplift calculation are provided in Appendix K of this report. A summary of the methodology is shown in the figure below. The uplift in land value compared to its existing use was calculated. This figure was then reduced to account for the additional traffic impact of the developments on existing road users (transport external costs), negative impacts on the environment and loss of land amenity value. Adjustments were also made to ensure that benefits were calculated at the national level, i.e. ensuring the economic benefits of the development did not just displace economic activity from elsewhere in the country.



The results of the dependent development assessment are provided in Chapter 6.

6. Economic Assessment Results

6.1 Introduction

The different types of benefits and costs, as well as the methodology for deriving them, have been discussed in Chapters 4 and 5.

This chapter presents the results of these assessments and how they have been used to derive the Benefit to Cost Ratio (BCR) and Value for Money of the scheme.

All results in this Chapter relate to the Core Scenario. The Core scenario has been produced in line with WebTAG guidance and does not include trips associated with Dependent Development. More details on the Core forecasting scenario can be found in the TFR (July 2019).

All costs and benefits presented in this chapter have been assessed over a 60-year project lifetime. As discussed in Chapter 2, all costs and benefits are shown in 2010 prices, discounted to 2010.

The final outputs of the appraisal are the Transport Economic Efficiency (TEE) table, the Analysis of Monetised Cost and Benefit (AMCB) table and the Public Account (PA) table, which are enclosed in Appendix C.

6.2 TEE – Travel Time Savings and Vehicle Operating Costs

It will take a shorter time to travel certain routes through the study area when the scheme is implemented, resulting in significant decreases in overall journey times.

The results of the travel time assessment show that, as expected, there are significant monetised benefits resulting from travel time savings, amounting to £102.3m.

The scheme also produces a net disbenefit of £6.0m from an increase in VOC. An overall VOC disbenefit, small in comparison to travel time benefits, is logical as the total travel distance across the network is slightly higher with the scheme than without the scheme. In addition, the impact of Variable Demand Modelling on the travel pattern also contributed to longer journey distances, as described in TFR (July 2019).

The TUBA results are included within the TEE table, as well as the AMCB table and the BCR. The following paragraphs look at the travel time results in more detail. Analysis of the travel time benefits by trip purpose, shown in Table 6.1 below, indicates that 38% of the benefits come from Business trips, 28% are associated with Commuting trips and 34% with Other trips.

Table 6.1: Travel Time Benefits by Journey Purpose (2010 prices, discounted to 2010)

Purpose	Time Benefits
Business	£37.9m
Commuting	£27.9m
Other	£34.6m
Total	**£100.3m**

Analysis of the travel time benefits by time period, as shown in Table 6.2 indicates that 32% of the benefits are associated with AM trips, 28% with PM trips and 40% with IP trips. The significant proportion of IP benefits is logical. Although journey time savings are higher during peak hours the annualisation factor for IP benefits is higher than factors for AM and PM benefits.

Table 6.2: Travel Time Benefits by Time Period (2010 prices, discounted to 2010)

Purpose	Time Benefits
Weekday AM	£31.6m
Weekday Interpeak	£40.1m
Weekday PM	£28.6m
Total	**£100.3m**

The travel time benefits have been also disaggregated into the three bands of time saved per vehicle, as shown in Table 6.3 below.

Table 6.3: Monetised Time Benefits by Size of Time Saving (2010 prices, discounted to 2010)

Net Journey Time Changes	0 to 2 minutes	2 to 5 minutes	More than 5 minutes
Business	£26.7m	£10.8m	£0.3m
Commuting	£22.6m	£5.3m	£0.01m
Other	£27.2m	£7.3m	£0.1m
Total	**£76.5m**	**£23.4m**	**£0.4m**

The portion of travel time savings show that the scheme favours the shorter travel time savings which is expected for online improvements to an existing road. The shorter travel time savings are mainly due to congestion being relieved for the trips that will use the A582 route in both Do Minimum and Do Something scenarios and longer journey time savings are associated with journeys not using other routes in Do Something scenario in favour of the A582 SRWD.

The travel time benefit profile over a scheme's life is used to determine whether the benefits of the scheme occur earlier or later in the scheme's life. The benefit profile over the 60-year assessment periods is shown in Figure 6.1. The benefit profile indicates that, as expected, the benefits increase between the Opening Year and Design Year and steadily decline afterwards. The two main reasons for the shape of this profile are:

- Increasing congestion in future years without the scheme, resulting in increased benefits once the scheme is in place
- The impact of discounting over time

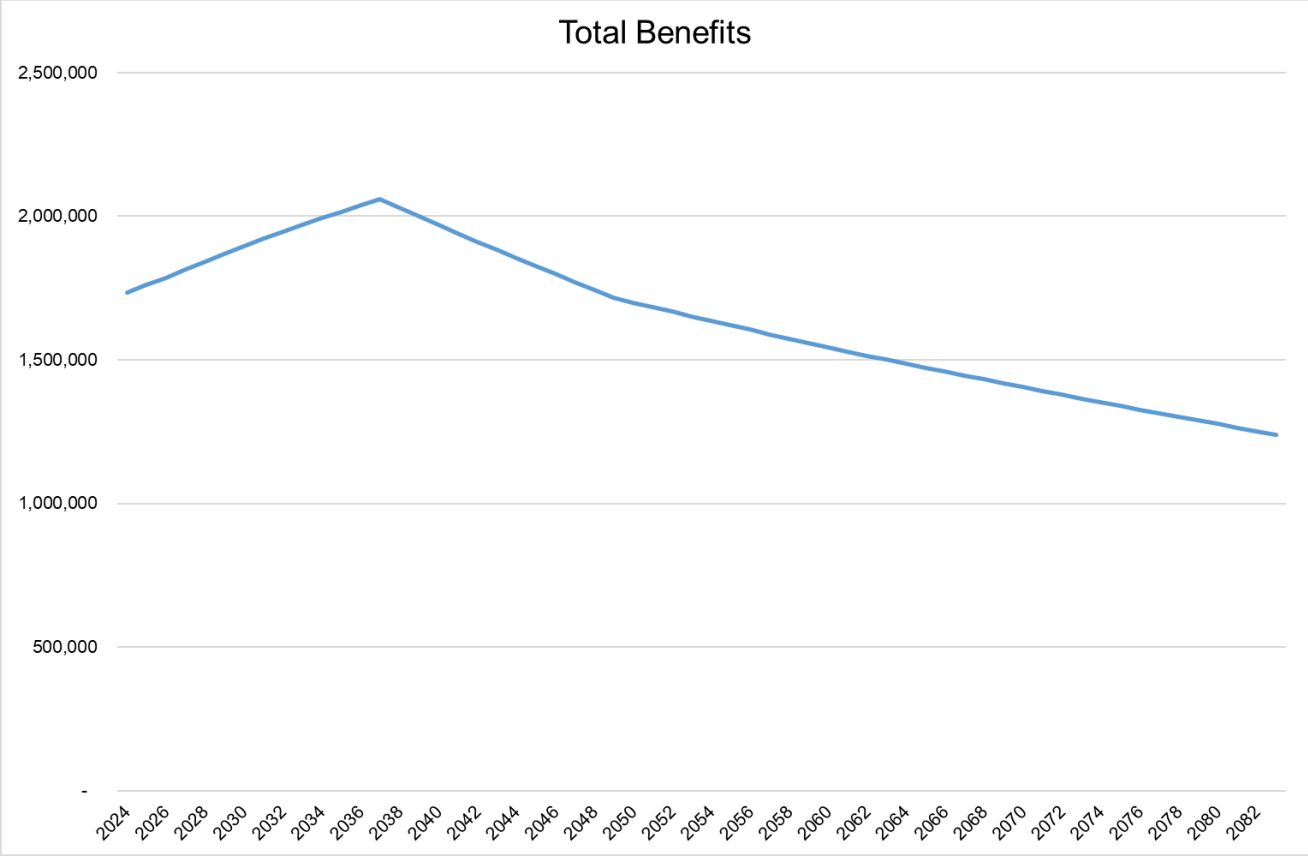


Figure 6.1: Travel Time Benefits (£) - 60-year profile (2010 prices, discounted to 2010)

The trips which account for the largest proportions of travel time benefits are listed below:

- Trips between Preston and areas in the South Ribble and mainly southwest of South Ribble. These trips will benefit from the scheme due to a reduction in congestion on A582.
- Trips within Preston and roads accessing Preston because of the reduction in congestion on the local roads and trips accessing Preston from south such as A6.
- Trips within South Ribble and southwest of South Ribble accessing all areas, chiefly east Lancashire and southeast Lancashire. These trips will benefit from the reduced congestion on A582 and being able to access the motorway links faster

The sector-to-sector analysis also shows that there could be disbenefits for some movements mainly those affected by a slight increase in journey time on the local roads in South Ribble. The highest disbenefits are expected to come from trips between Preston and east Lancashire and GB south and Preston because of more traffic at the motorway junction to get to A582. Movements from Warton and Blackpool to Preston and Southport will also incur disbenefits because of the shift of traffic within Preston to use A582 with scheme in place.

The geographical distribution of the travel time and VOC benefits is shown in the sector-to-sector analysis contained in Appendix I.

6.3 TEE – Construction and Maintenance Delay Results

6.3.1 Construction Delay Results

The SRWD scheme is partly being constructed on-line (when tying in junctions) and partly off-line (in parallel the existing road network). Delays to existing traffic will be kept to a minimum through the use of effective traffic management, as described in Chapter 5, but it is inevitable that there will be some delays to traffic due to the use of speed and lane restrictions during the construction period.

The construction delay disbenefits are estimated to be £4.4m (2010 prices, discounted to 2010). The disbenefit was split between different journey purposes using the same proportions as the TUBA results as presented in Table 6.1. The construction delay disbenefits to Business, Commuting and Other users are -£1.5m, -£1.1m, and -£1.5m respectively.

6.3.2 Maintenance Delays Results

As discussed in Chapter 5, delays will be experienced by road users during periods of maintenance in the future situations both with and without the scheme.

With SRWD in place, maintenance of the A582 will cause less delays to the road users due to availability of more road capacity during maintenance. However due to higher amount of flows on A582 with scheme in place, the total delays incurred by road users result in a disbenefit. For this reason, the overall impact of the maintenance delays because of the scheme is expected to be negative with a net disbenefit of -£0.3m.

Similarly, to the construction delay disbenefits the maintenance delay benefits were split between different journey purposes using the same proportions as the TUBA results. The resulting maintenance delay disbenefits to Business, Commuting and Other users are therefore -£0.10m, -£0.07m and -£0.09m respectively.

Results of construction and maintenance delay analysis are summarised in Table 6.4. The results are also included in the TEE and AMCB tables and are used in calculating the scheme BCR.

Table 6.4: QUADRO analysis results (2010 prices, discounted to 2010)

QUADRO Assessment	Do Minimum	Do Something	Overall Benefits
Construction Delay	NA	-£4.0m	-£4.0m
Maintenance Delay	-£4.7m	-£4.9m	-£0.3m
Total	**-£4.7m**	**-£8.9m**	**-£4.3m**

6.4 Changes in Indirect Tax Revenues

As discussed in Chapter 5, changes in indirect tax revenues are included as part of the Present value of Benefits (PVB) of the scheme.

Change in indirect tax revenue equates to a net benefit of £4.0m, which is the result of higher distances-travelled with the scheme in place. This is added to the benefits, as shown in Appendix C.

6.5 Accident Results

COBA-LT was used to estimate numbers of accidents, and their associated costs, for the situations both with and without the scheme. The results of the analysis show that there would be an overall decrease in accidents within the COBA-LT study area.

The majority of safety benefits are expected along the A582 scheme because of the safety standards of a new dual carriageway compared to the single carriageway. Benefits are also driven by reduction of traffic on other local roads such as Lostock Hall and A6. The junctions mainly result in disbenefits because of the increase in traffic. Benefits and disbenefits across the whole COBA-LT network are presented in Appendix J, colour-coded by the size of benefit.

Table 6.5 below shows the decrease in the predicted number of accidents and casualties over the 60-year assessment period for the area of interest. There are predicted to be 4 and 19 fewer fatal and serios casualties respectively, over this period with the scheme in place. The scheme is also expected to result in an increase in number of slight casualties, because of the increase in flows at junctions on A582. The monetary value of the overall change in accidents would be a benefit of £3.9m (2010 prices, discounted to 2010).

Table 6.5: Predicted Accident Reductions over the 60 year Appraisal Period

Accident and Casualties	Change (+ve: Increase / –ve: Decrease)
Change in number of accidents	**25**
Change in number of casualties	**241**
Fatal	-4
Serious	-19
Slight	256

The accident results are included within the AMCB Table and the calculation of BCR.

6.6 Greenhouse Gas Emissions, Noise and Air Quality Results

As described in Chapter 5 Greenhouse Gas Emissions, Air Quality and Noise benefits have been derived using standard environmental spreadsheets recommended by WebTAG.

The results output from the Greenhouse Gas emissions spreadsheet for the study area predict an increase in carbon dioxide emissions of 162,314 tonnes over the 60-year appraisal period. These changes are due to an increase in distance travelled once the scheme is in place despite there being a decrease in overall travel times. There is no change in traded carbon dioxide emissions as a result of the scheme. The monetary value of the increase in carbon dioxide emissions over the 60-year appraisal period is a disbenefit of -£7.3m.

An increase in regional NOx emissions over the 60-year appraisal period is predicted, with an associated monetary disbenefit of -£0.1m. However, South Ribble Borough Council AQMA No. 3 (Lostock Hall) has a reduction in traffic flows. This reduction in traffic flows is likely to result in an improvement in air quality in this AQMA.

The results output from the Noise spreadsheet show that there is predicted to be a benefit from changes in noise levels, equating to £1.8m over the 60-year appraisal period. There will be 101 fewer households above Significant Observed Adverse Effect Level (SOAEL) because of noise after the scheme is built.

The results of environmental impacts of the scheme are summarised in Table 6.6 below.

Table 6.6: Environmental Benefits (2010 prices, discounted to 2010)

Environmental Assessment	Benefits
Greenhouse Gas	-£7.3m
Air Quality (NOx emissions)	-£0.1m
Noise	£1.8m

6.7 Journey Time Reliability Results

The monetised impacts of the scheme on the journey time reliability have been estimated for journeys that use A582 SRWD, as detailed in Chapter 5.

As a result of the reduction in congestion and accidents on A582, the scheme is estimated to improve the journey time reliability, which is estimated to be a total benefit of £6.7m (2010 prices, discounted to 2010). Table 6.7 shows the results of the journey time reliability analysis by trip purpose.

Table 6.7: Journey Time Reliability Benefits (2010 prices, discounted to 2010)

Trip Purpose	Benefits
Business Users	£1.2m
Non-Business: Commuting	£3.0m
Non-Business: Other	£2.4m
Total	**£6.7m**

In line with WebTAG guidance, this element of appraisal is not considered within the AMCB and therefore has not been included in the calculation of the BCR.

6.8 Wider Economic Results

The appraisal of the wider economic benefits of the SRWD is described in Chapter 5. This assessment results are provided below.

In line with TAG, there is less certainty around the assessment of wider impacts than for the traditional transport user benefits presented elsewhere in this report. Therefore, the wider impacts results are not reported in the AMCB table or 'initial BCR'. They are however reported in the scheme's Appraisal Summary Table and are included within the scheme's 'adjusted BCR'.

6.8.1 Agglomeration Results

The agglomeration results output from WITA are reported below, for each separate industrial sector. In common with the results of the TUBA assessment, the results are for a 60-year appraisal period and are provided in 2010 prices discounted to 2010.

Table 6.8: Agglomeration Results Summary

Sector	Results (£m, 2010 prices discounted to 2010)
Agglomeration – Manufacturing	£1.7m
Agglomeration – Construction	£5.8m
Agglomeration – Consumer Services	£12.0m
Agglomeration – Producer Services	£18.7m
Agglomeration - Total	**£38.2m**

As discussed in Chapter 5, these results have been extracted for a 'core area' around the scheme. It can be seen that almost half of the agglomeration benefits are expected to accrue to the 'Producer Services' sector.

Figure 6.2 shows how overall agglomeration benefits will be distributed across Local Authorities. The scheme is expected to provide the vast majority of its agglomeration benefits to South Ribble (£17m) and Preston (£16m).

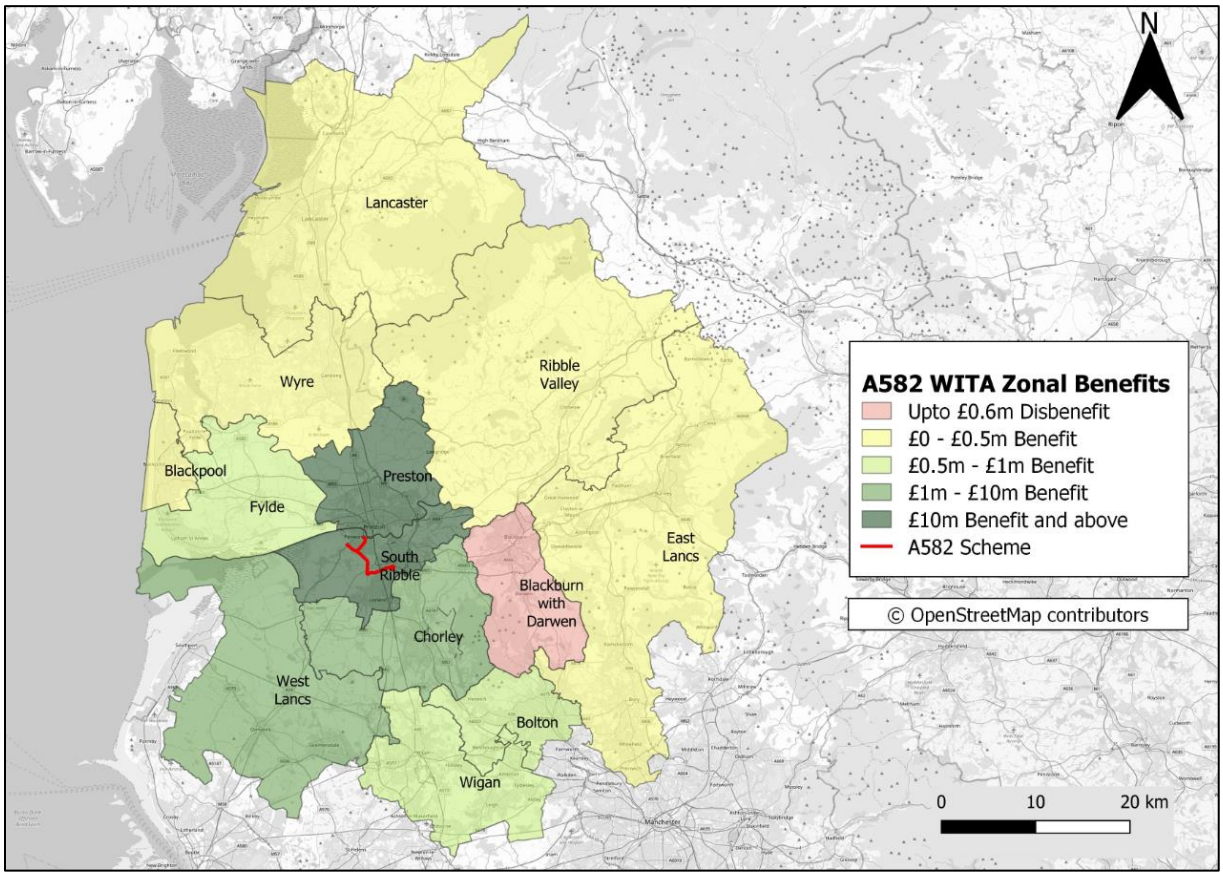


Figure 6.2: WITA Zonal Benefits for A582 Scheme

6.8.2 Labour Supply Results

As discussed above, labour supply impacts are considered likely to occur, as reductions in commuting costs due to the scheme results in some people moving into work who had previously considered the cost of travel too high.

The labour supply results, over a 60-year appraisal period in 2010 prices discounted to 2010, are shown in Table 6.9. Note that, as with the productivity impacts, these benefits were extracted for a 'core study area' around the scheme.

Table 6.9: Labour Supply Benefits

	Results (£m, 2010 prices discounted to 2010)
Labour Supply Impacts	£0.8m

Compared to the productivity results, these results are very small. This matches evidence from previous appraisals where the vast majority of WITA benefits are due to productivity increases rather than labour supply impacts. It also confirms the evidence described in the Economic Narrative, where poor productivity is a known significant problem, whereas the evidence of commuting costs causing a significant barrier to labour market entry is less strong.

6.8.3 Output Change Results

Market failures have been identified which indicate that the assumption of 'perfect competition' in terms of business output is untrue. This includes the fact that the scheme delivers significant benefits to freight, where a small number of large companies dominate the sector.

Because of these market failures, the additional output produced by firms as a result of decreased travel costs is not fully captured in the standard business user benefits calculation. The additional benefit is calculated as a 10% uplift to the scheme's standard Business User Benefits. The results of this uplift are shown in Table 6.10 below.

Table 6.10: Output Change in Imperfectly Competitive Market Calculation

	£m, 2010 prices discounted to 2010
Standard Business User Benefits (incl. freight) due to time savings and VOC changes	£35.5m
10% Uplift to account for Output Change in Imperfectly Competitive Markets	**£3.5m**

6.8.4 Wider Impact Results Summary

A summary of the Wider Impacts results is provided in Table 6.11.

Table 6.11: Wider Impacts Results Summary

Sector	Results (£m, 2010 prices discounted to 2010)
Agglomeration	£38.2m
Labour Supply Impacts	£0.8m
Output Change in Imperfectly Competitive Markets	£3.5m
Agglomeration - Total	**£42.5m**

6.9 Dependent Development Benefits

The economic benefits from the housing and employment development sites unlocked by the A582 SRWD have been estimated, as summarised in Chapter 5 and discussed in detail in Appendix K.

The total dependent development benefits are £33.7m (2010 prices discounted to 2010). Further details are provided in Appendix K.

Although these benefits are monetised, they are not included in the BCR. However, they are considered within the overall value for money assessment.

6.10 Summary of Economic Impacts of the Scheme

A summary of the economic assessment results and the scheme BCR is provided in Table 6.12.

Table 6.12: Summary of Economic Assessment Results (2010 prices, discounted to 2010)

Impact			Monetary Value
Costs	Investment Costs		£59.9m
	Operating Costs (Capital Costs of Maintenance)		£1.1m
	Total PVC		**£60.3m**
Benefits within Initial BCR	TEE Benefits	Commuting Travel Time Benefits	£27.9m
		Other User Travel Time Benefits	£34.6m
		Business User Travel Time Benefits	£37.9m
		VOC Benefits	-£5.6m
		Construction Delay Benefits	-£4.0m
		Maintenance Delay Benefits	-£0.3m
	Indirect Tax Revenues		£4.0m
	Accident Benefits		£3.9m
	Greenhouse Gas Emissions		-£7.3m
	Air Quality		-£0.1m
	Noise		£1.8m
	Total PVB		**£92.8m**
Net Present Value (NPV)			**£32.5m**
Initial Benefit to Cost Ratio (BCR)			**1.5**
Wider Economic Impacts for Inclusion in Adjusted BCR	Labour supply impacts		£0.8m
	Productivity: Static Clustering		£38.2m
	Output change in imperfectly competitive markets		£3.5m
	TOTAL		**£42.5m**
Total PVB (including Wider Economic Impacts)			**£135.3m**
Adjusted BCR			**2.2**
	Journey Time Reliability Benefits		£6.7m

Impact		Monetary Value
Benefits not included in BCR	Dependent Development benefits (land value uplift)	£33.7m

Based on the monetised costs and benefits of the scheme, Initial and Adjusted Benefit Cost Ratio (BCR) metrics can be used to identify the likely Value for Money category of a scheme. The categories are:

- Poor VfM: if BCR is below 1.0
- Low VfM: if the BCR is between 1.0 and 1.5
- Medium VfM: if the BCR is between 1.5 and 2.0
- High VfM: if the BCR is between 2.0 and 4.0
- Very High VfM: if the BCR is greater than 4.0

Based on the 'established' monetised impacts presented in the AMCB table, the total monetised benefits (PVB) of the scheme, £92.8m, will exceed the scheme cost (PVC) of £60.3m, by £32.5m (NPV) (2010 prices, discounted to 2010). The Initial BCR of the scheme is therefore 1.5.

The scheme also delivers wider economic benefits from labour supply, productivity and output change in imperfectly competitive markets, which equate to £42.5m (2010 prices, discounted to 2010). This results in Adjusted BCR of 2.2.

Any BCR between 2 and 4 indicates the scheme is likely to offer High Value for Money based on DfT guidance criteria.

6.11 Switching Values

If the scheme costs are unchanged, for the scheme to fall into Medium Value for Money category (indicated by a BCR of below 2) the PVB would need to decrease by £14.8m or around 11%.

Given the indicative benefits of £40.4m which are excluded from the BCR (from journey time reliability and unlocked developments), and the fact that most of the non-monetised impacts are beneficial or slightly adverse, the risk of the scheme falling into the medium value for money category is considered low.

A sensitivity test has also been undertaken around the scheme costs. For scheme to fall into Medium Value for Money category, the PVC should increase by £7.4m or around 12% to £67.6m. This is while an optimism bias of 44% is included in the calculation of the scheme PVC. Even if this was the case, it is still likely that the scheme would be considered to offer high value for money, given the £40.4m of indicative monetised benefits which are not included in that BCR.

7. Summary and Conclusion

7.1 Summary

The economic assessment of the A582 SRWD scheme includes consideration of the following impacts, in line with WebTAG guidance:

- Transport Economic Efficiency (TEE) benefits, consisting of two elements:
  - Travel time and Vehicle Operating Cost (VOC) benefits and disbenefits
  - Travel time and VOC benefits and disbenefits because of construction and maintenance activities
- Changes in taxes
- The impacts of the scheme on Accidents
- The Environmental Impacts (air quality, noise, greenhouse gases) calculated as part of Environmental Impact Appraisal
- The impacts of the scheme on Journey Time Reliability
- Wider Economic Impacts as a result of the proposed scheme:
  - Labour supply impacts
  - Productivity - Static Clustering
  - Output change in imperfectly competitive markets
  - Dependent Development benefits (land value uplift)
- The Costs of the scheme, consisting of two elements:
  - Construction, land and compensation, preparation and supervision costs
  - Changes in maintenance costs

A summary of the economic assessment results for Option Package 4 is provided in Table 7.1.

Table 7.1: Summary of Economic Assessment Results (2010 prices, discounted to 2010)

Impact			Monetary Value
Costs	Investment Costs		£59.9m
	Operating Costs (Capital Costs of Maintenance)		£1.2m
	Total PVC		**£61.1m**
Benefits within Initial BCR	TEE Benefits	Commuting Travel Time Benefits	£27.9m
		Other User Travel Time Benefits	£34.6m
		Business User Travel Time Benefits	£37.9m
		VOC Benefits	-£5.6m
		Construction Delay Benefits	-£4.0m
		Maintenance Delay Benefits	-£0.3m
	Indirect Tax Revenues		£4.0m
	Accident Benefits		£3.9m
	Greenhouse Gas Emissions		-£7.3m

Impact		Monetary Value
	Air Quality	-£0.1m
	Noise	£1.8m
	Total PVB	**£92.8m**
Net Present Value (NPV)		**£31.7m**
Initial Benefit to Cost Ratio (BCR)		**1.52**
Wider Economic Impacts for Inclusion in Adjusted BCR	Labour supply impacts	£0.8m
	Productivity: Static Clustering	£38.2m
	Output change in imperfectly competitive markets	£3.5m
	TOTAL	**£42.5m**
Total PVB (including Wider Economic Impacts)		**£135.3m**
Adjusted BCR		**2.2**
Benefits not included in BCR	Journey Time Reliability Benefits	£6.7m
	Dependent Development benefits (land value uplift)	£33.7m

7.2 Conclusion

Economic assessment of the A582 South Ribble Western Distributor demonstrated that the scheme delivers significant travel time benefits, together with a reduction in accidents in the local and urban roads surrounding the scheme. The total benefits of the scheme reported in the AMCB table are £92.8m (PVB). The total costs of the scheme are £61.1m (PVC). The initial Benefit to Cost Ratio (BCR) is therefore 1.5.

The scheme also delivers wider economic benefits from labour supply, productivity (static clustering) and output change in imperfectly competitive markets, which equate to £42.5m (2010 prices, discounted to 2010) and results in adjusted BCR of 2.2. With a BCR of above 2, the scheme is likely to offer High Value for Money.

Other impacts which have been monetised but not included in the BCR calculations are journey time reliability (£6.7m) and land value uplift as a result of unlocking dependent development (£33.7m).

Appendix A. Scheme Base Costs Provided by Lancashire County Council

Appendix B. Scheme Costs, Spend profile and TAG Worksheet Cost Proforma

Cost Element	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Construction	0.0%	0.0%	14.0%	44.3%	36.4%	5.3%	0.0%	0.0%	0.0%	100%
Land / Part 1 Claims / Property	0.0%	0.0%	31.0%	0.0%	0.0%	0.0%	0.0%	34.5%	34.5%	100%
Preparation	9.5%	63.9%	26.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Supervision	0.0%	0.0%	13.8%	36.9%	38.9%	3.2%	2.3%	2.4%	2.5%	100%

Appendix C. TEE, AMCB and PA Tables

Table C.1: Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	**ALL MODES**		**ROAD**		**BUS and COACH**	**RAIL**		**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**		**Passengers**	**Passengers**		
Travel time	£27,854		£27,854					
Vehicle operating costs	-£2,378		-£2,378					
User charges	£0		£0					
During Construction & Maintenance	-£1,188		-£1,188					
NET NON-BUSINESS BENEFITS: COMMUTING	£24,288	*(1a)*	£24,288					
Non-business: Other	**ALL MODES**		**ROAD**		**BUS and COACH**	**RAIL**		**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**		**Passengers**	**Passengers**		
Travel time	£34,579		£34,579					
Vehicle operating costs	-£2,436		-£2,436					
User charges	£0		£0					
During Construction & Maintenance	-£1,474		-£1,474					
NET NON-BUSINESS BENEFITS: OTHER	£30,669	*(1b)*	£30,669					
Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	£37,857		£24,931	£12,926				
Vehicle operating costs	-£780		-£764	-£16				
User charges	£0		£0	£0				
During Construction & Maintenance	-£1,614		-£1,063	-£551				
Subtotal	£35,463	*(2)*	£23,104	£12,359				
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	-							
Operating costs	£0							
Investment costs	£0							
Grant/subsidy	£0							
Subtotal	£0	*(3)*						
Other business impacts								
Developer contributions	£0	*(4)*						
NET BUSINESS IMPACT	£35,463	*(5) = (2) + (3) + (4)*						
TOTAL								
Present Value of Transport Economic Efficiency Benefits (TEE)	£90,420	*(6) = (1a) + (1b) + (5)*						

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Table C.2: Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	£0		£0			
Operating Costs	£0		£0			
Investment Costs	£0		£0			
Developer and Other Contributions	£0		£0			
Grant/Subsidy Payments	£0		£0			
NET IMPACT	£0	*(7)*	£0			
Central Government Funding: Transport						
Revenue	£0		£0			
Operating costs	£1,128		£1,128			
Investment Costs	£59,125		£59,125			
Developer and Other Contributions	£0		£0			
Grant/Subsidy Payments	£0		£0			
NET IMPACT	£60,253	*(8)*	£60,253			
Central Government Funding: Non-Transport						
Indirect Tax Revenues	-£3,972	*(9)*	-£3,972			
TOTALS						
Broad Transport Budget	£60,253	*(10) = (7) + (8)*				
Wider Public Finances	-£3,972	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

All entries are discounted present values in 2010 prices and values.

Table C.3: Analysis of Monetised Costs and Benefits

Noise	£1,829	*(12)*
Local Air Quality	-£80	*(13)*
Greenhouse Gases	-£7,271	*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents	£3,894	*(17)*
Economic Efficiency: Consumer Users (Commuting)	£24,288	*(1a)*
Economic Efficiency: Consumer Users (Other)	£30,669	*(1b)*
Economic Efficiency: Business Users and Providers	£35,463	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	£3,972	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£92,764	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£60,253	*(10)*
Present Value of Costs (see notes) (PVC)	£60,253	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£32,511	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.54	BCR=PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix D. Maintenance Cost Profile

Table a - Total Do Something Maintenance Costs (with Optimism Bias)

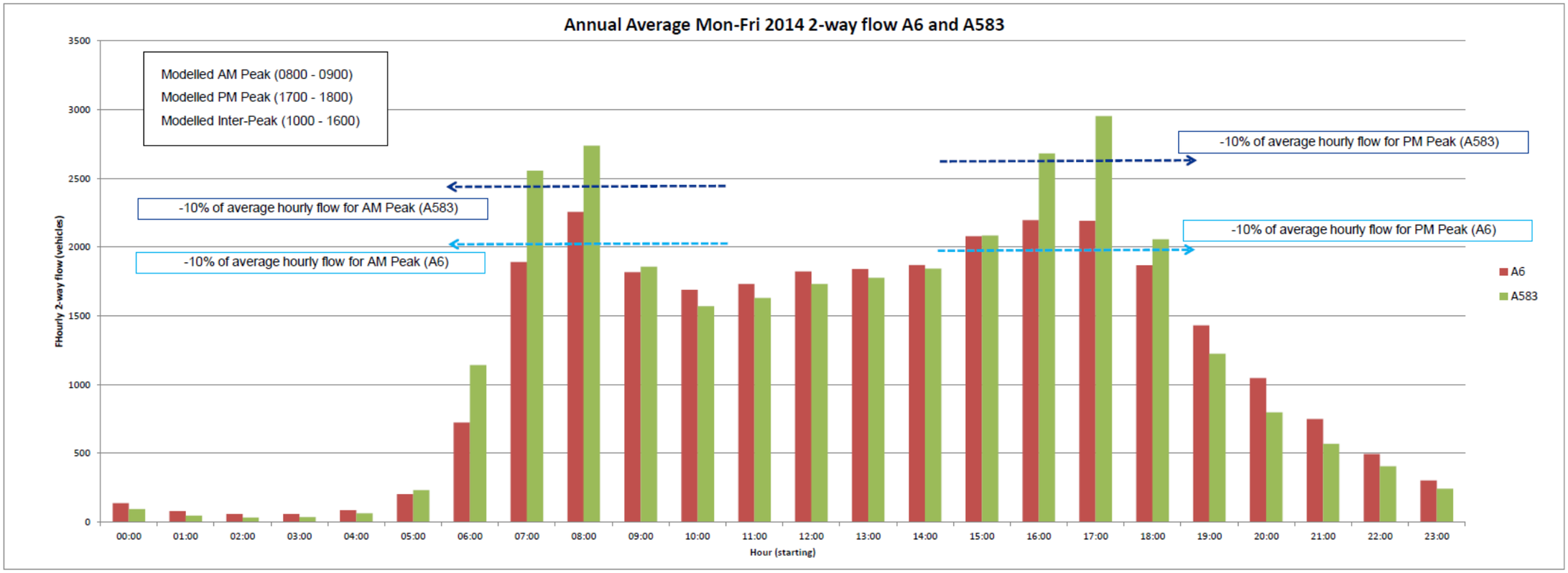
Year	Year after Opening	Total Cost '000s in 2010 Prices	Spend Profile
2024	2	£0	0.0%
2025	3	£0	0.0%
2026	4	£0	0.0%
2027	5	£0	0.0%
2028	6	£0	0.0%
2029	7	£0	0.0%
2030	8	£0	0.0%
2031	9	£0	0.0%
2032	10	£0	0.0%
2033	11	£0	0.0%
2034	12	£0	0.0%
2035	13	£1,626	10.0%
2036	14	£0	0.0%
2037	15	£0	0.0%
2038	16	£0	0.0%
2039	17	£0	0.0%
2040	18	£0	0.0%
2041	19	£0	0.0%
2042	20	£0	0.0%
2043	21	£0	0.0%
2044	22	£0	0.0%
2045	23	£571	3.5%
2046	24	£2,610	16.1%
2047	25	£0	0.0%
2048	26	£0	0.0%
2049	27	£0	0.0%
2050	28	£0	0.0%
2051	29	£0	0.0%
2052	30	£0	0.0%
2053	31	£0	0.0%
2054	32	£0	0.0%
2055	33	£387	2.4%
2056	34	£4,247	26.2%
2057	35	£0	0.0%
2058	36	£0	0.0%
2059	37	£0	0.0%
2060	38	£0	0.0%
2061	39	£0	0.0%
2062	40	£0	0.0%
2063	41	£0	0.0%
2064	42	£571	3.5%
2065	43	£0	0.0%
2066	44	£2,610	16.1%
2067	45	£0	0.0%
2068	46	£0	0.0%
2069	47	£0	0.0%
2070	48	£0	0.0%
2071	49	£0	0.0%
2072	50	£0	0.0%
2073	51	£387	2.4%
2074	52	£0	0.0%
2075	53	£0	0.0%
2076	54	£2,610	16.1%
2077	55	£0	0.0%
2078	56	£0	0.0%
2079	57	£0	0.0%
2080	58	£0	0.0%
2081	59	£0	0.0%
2082	60	£571	3.5%
2083	61	£0	0.0%
TOTAL (Undiscounted)		**£16,189.3**	**100.0%**

Table b - Total Do Minimum Maintenance Costs (with Optimism Bias)

Year	Year after Opening	Total Cost '000s in 2010 Prices	Spend Profile
2024	2	£2,061	26.8%
2025	3	£0	0.0%
2026	4	£0	0.0%
2027	5	£0	0.0%
2028	6	£0	0.0%
2029	7	£0	0.0%
2030	8	£0	0.0%
2031	9	£0	0.0%
2032	10	£0	0.0%
2033	11	£0	0.0%
2034	12	£0	0.0%
2035	13	£540	7.0%
2036	14	£0	0.0%
2037	15	£0	0.0%
2038	16	£0	0.0%
2039	17	£0	0.0%
2040	18	£0	0.0%
2041	19	£0	0.0%
2042	20	£0	0.0%
2043	21	£0	0.0%
2044	22	£0	0.0%
2045	23	£0	0.0%
2046	24	£1,963	25.5%
2047	25	£0	0.0%
2048	26	£0	0.0%
2049	27	£0	0.0%
2050	28	£0	0.0%
2051	29	£0	0.0%
2052	30	£0	0.0%
2053	31	£0	0.0%
2054	32	£0	0.0%
2055	33	£0	0.0%
2056	34	£540	7.0%
2057	35	£0	0.0%
2058	36	£0	0.0%
2059	37	£0	0.0%
2060	38	£0	0.0%
2061	39	£0	0.0%
2062	40	£0	0.0%
2063	41	£0	0.0%
2064	42	£0	0.0%
2065	43	£0	0.0%
2066	44	£2,061	26.8%
2067	45	£0	0.0%
2068	46	£0	0.0%
2069	47	£0	0.0%
2070	48	£0	0.0%
2071	49	£0	0.0%
2072	50	£0	0.0%
2073	51	£0	0.0%
2074	52	£0	0.0%
2075	53	£0	0.0%
2076	54	£540	7.0%
2077	55	£0	0.0%
2078	56	£0	0.0%
2079	57	£0	0.0%
2080	58	£0	0.0%
2081	59	£0	0.0%
2082	60	£0	0.0%
2083	61	£0	0.0%
TOTAL (Undiscounted)		**£7,704.8**	**100.0%**

Appendix E. Flow Analysis for TUBA Annualisation Factors

A6 & A583 - Derivation of Annualisation Factors



Expansion Factors	
Expansion factor for Mon-Fri AM Peak period is 1*2=	2
Expansion factor for Mon-Fri PM Peak period is 1*2=	2

Weekdays	A6	A583
Average AM Peak	2255	2739
Average PM Peak	2190	2953
Average IP Peak	1838	1773
Average flow (7pm-7am)	447	406
-10% Average AM	2030	2465
-10% Average PM	1971	2658

Results:	Annualisation factors derived from expansion factors using flows above 90% of the average modelled peak period for Mon-Fri	
1	The annualisation factor for the AM period is 2*253 working days=	506
2	The annualisation factor for the IP period is 6*253 working days=	1518
3	The annualisation factor for the PM period is 2*253 working days=	506
4	The annualisation factor for the AM shoulder is 1*253 working days=	253
5	The annualisation factor for the PM shoulder is 1*253 working days=	253

Appendix F. TUBA Input File

SCHEME SPECIFIC PARAMETERS
PARAMETERS
TUBA_version 1.9.12
run_name A582
do_min_name Do Minimum
do_som_name Do Something
first_yr 2024
horizon_yr 2083
modelled_yrs 2024 2037
detail Yes
current_yr 2019
print_warn All
P&R_car_speed 65.0
zones_as_sectors No
TIME_SLICES

*no.	duration(min)	annualisation	period	description
1	60	506	1	Ave AM Peak
2	60	506	2	Ave PM Peak
3	60	1518	3	Ave INTER Peak
4	60	253	1	Ave AM Peak Shoulder
5	60	253	2	Ave PM Peak Shoulder

SCHEMES_DM

*Mode	1st Construction year	Opening_yr	Stage
1	2019	2024	OP
2	2019	2024	OP

DO_MIN_COSTS

*Type	Mode	Funding	Cost	Price	RPI
M	1	cen	7704.8	F	100.00

DO_MIN_PROFILE

*Year	Mode	%Const	%Land	%Prep	%Super	%Maint	%Op	%Grant	%Dev
2024	1	0.0	0.0	0.0	0.0	26.7	0.0	0.0	0.0
2025	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2026	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2027	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2028	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2029	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2030	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2031	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2032	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2033	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2034	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2035	1	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0
2036	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2037	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2038	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2039	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2040	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2041	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2042	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2043	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2044	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2045	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2046	1	0.0	0.0	0.0	0.0	25.5	0.0	0.0	0.0
2047	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2048	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2049	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2050	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2051	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2052	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2053	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2054	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2055	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2056	1	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0
2057	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2058	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2059	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2060	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2061	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2062	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2063	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2064	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2065	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2066	1	0.0	0.0	0.0	0.0	26.8	0.0	0.0	0.0
2067	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2068	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2069	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2070	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2071	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2072	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2073	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2074	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2075	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2076	1	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0

DO_MIN_DELAY_COSTS

*Year	Mode	Business	Commuting	Other	Freight

SCHEMES_DS

*Mode	1st Construction year	Opening_yr	Stage
1	2019	2024	OP

DO_SOM_COSTS

*Type	Mode	Funding	Cost	Price	GDP
C	1	cen	71118.6	F	116.76
L	1	cen	4304.2	F	116.76
P	1	cen	8615.4	F	116.76
S	1	cen	4301.0	F	116.76
M	1	cen	16189.3	F	100.00

DO_SOM_PROFILE

*Year	Mode	%Const	%Land	%Prep	%Super	%Maint	%Op	%Grant	%Dev
2019	1	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0
2020	1	0.0	0.0	63.9	0.0	0.0	0.0	0.0	0.0
2021	1	14.0	31.0	26.5	13.8	0.0	0.0	0.0	0.0
2022	1	44.3	0.0	0.0	36.9	0.0	0.0	0.0	0.0
2023	1	36.4	0.0	0.0	38.9	0.0	0.0	0.0	0.0
2024	1	5.3	0.0	0.0	3.2	0.0	0.0	0.0	0.0
2025	1	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0
2026	1	0.0	34.5	0.0	2.4	0.0	0.0	0.0	0.0
2027	1	0.0	34.5	0.0	2.5	0.0	0.0	0.0	0.0
2028	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2029	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2030	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2031	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2032	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2033	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2034	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2035	1	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
2036	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2037	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2038	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2039	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2040	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2041	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2042	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2043	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2044	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2045	1	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0
2046	1	0.0	0.0	0.0	0.0	16.1	0.0	0.0	0.0
2047	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2048	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2049	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2050	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2051	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2052	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2053	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2054	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2055	1	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0
2056	1	0.0	0.0	0.0	0.0	26.2	0.0	0.0	0.0
2057	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2058	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2059	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2060	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2061	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2062	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2063	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2064	1	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0
2065	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2066	1	0.0	0.0	0.0	0.0	16.1	0.0	0.0	0.0
2067	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2068	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2069	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2070	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2071	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2072	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2073	1	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0
2074	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2075	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2076	1	0.0	0.0	0.0	0.0	16.1	0.0	0.0	0.0
2077	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2078	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2079	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2081	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2082	1	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0
2083	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DO_SOM_DELAY_COSTS

*Year	Mode	Business	Commuting	Other	Freight

BENEFIT_CHANGE

*% change p.a.

*Start_yr	End_yr	Submode	ChangePer1	ChangePer2	ChangePer3	ChangePer4	ChangePer5

USER_CLASSES

*no.	Veh/submode	purpose	person_type
1	1	2	0
2	1	1	0
3	1	3	0
4	2	0	0
5	3	0	0
6	4	0	0
7	5	0	0

INPUT_MATRICES

* no.	userclasses		timeslice		type	format	scenario year	factor	filename
1	1	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC1.TXT
2	2	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC2.TXT
3	3	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC3.TXT
4	4	V	2	0	2024	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC4.TXT
5	5	V	2	0	2024	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC4.TXT
6	6	V	2	0	2024	0.24			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC5.TXT
7	7	V	2	0	2024	0.27			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DM_UC5.TXT
8	1	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC1.TXT
9	2	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC2.TXT
10	3	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC3.TXT
11	4	V	2	0	2024	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC4.TXT
12	5	V	2	0	2024	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC4.TXT
13	6	V	2	0	2024	0.24			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC5.TXT
14	7	V	2	0	2024	0.27			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DM_UC5.TXT
15	1	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC1.TXT
16	2	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC2.TXT
17	3	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC3.TXT
18	4	V	2	0	2024	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC4.TXT
19	5	V	2	0	2024	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC4.TXT
20	6	V	2	0	2024	0.24			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC5.TXT
21	7	V	2	0	2024	0.27			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC5.TXT
22	1	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC1.TXT
23	2	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC2.TXT
24	3	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC3.TXT
25	4	V	2	0	2024	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC4.TXT
26	5	V	2	0	2024	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC4.TXT
27	6	V	2	0	2024	0.24			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC5.TXT
28	7	V	2	0	2024	0.27			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC5.TXT
29	1	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC1.TXT
30	2	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC2.TXT
31	3	V	2	0	2024	1			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC3.TXT
32	4	V	2	0	2024	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC4.TXT
33	5	V	2	0	2024	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC4.TXT
34	6	V	2	0	2024	0.24			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC5.TXT
35	7	V	2	0	2024	0.27			C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DM_UC5.TXT
36	1	V	2	0	2037	1			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC1.TXT
37	2	V	2	0	2037	1			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC2.TXT
38	3	V	2	0	2037	1			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC3.TXT
39	4	V	2	0	2037	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC4.TXT
40	5	V	2	0	2037	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC4.TXT
41	6	V	2	0	2037	0.24			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC5.TXT
42	7	V	2	0	2037	0.27			C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DM_UC5.TXT
43	1	V	2	0	2037	1			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC1.TXT
44	2	V	2	0	2037	1			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC2.TXT
45	3	V	2	0	2037	1			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC3.TXT
46	4	V	2	0	2037	0.12			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC4.TXT
47	5	V	2	0	2037	0.88			C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC4.TXT

48	6	2	V	2	0	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC5.TXT
49	7	2	V	2	0	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DM_UC5.TXT
50	1	3	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC1.TXT
51	2	3	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC2.TXT
52	3	3	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC3.TXT
53	4	3	V	2	0	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC4.TXT
54	5	3	V	2	0	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC4.TXT
55	6	3	V	2	0	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC5.TXT
56	7	3	V	2	0	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC5.TXT
57	1	4	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC1.TXT
58	2	4	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC2.TXT
59	3	4	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC3.TXT
60	4	4	V	2	0	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC4.TXT
61	5	4	V	2	0	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC4.TXT
62	6	4	V	2	0	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC5.TXT
63	7	4	V	2	0	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC5.TXT
64	1	5	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC1.TXT
65	2	5	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC2.TXT
66	3	5	V	2	0	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC3.TXT
67	4	5	V	2	0	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC4.TXT
68	5	5	V	2	0	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC4.TXT
69	6	5	V	2	0	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC5.TXT
70	7	5	V	2	0	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DM_UC5.TXT
71	1	1	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC1.TXT
72	2	1	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC2.TXT
73	3	1	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC3.TXT
74	4	1	V	2	1	2024	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC4.TXT
75	5	1	V	2	1	2024	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC4.TXT
76	6	1	V	2	1	2024	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC5.TXT
77	7	1	V	2	1	2024	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2022_DS_UC5.TXT
78	1	2	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC1.TXT
79	2	2	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC2.TXT
80	3	2	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC3.TXT
81	4	2	V	2	1	2024	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC4.TXT
82	5	2	V	2	1	2024	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC4.TXT
83	6	2	V	2	1	2024	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC5.TXT
84	7	2	V	2	1	2024	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2022_DS_UC5.TXT
85	1	3	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC1.TXT
86	2	3	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC2.TXT
87	3	3	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC3.TXT
88	4	3	V	2	1	2024	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC4.TXT
89	5	3	V	2	1	2024	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC4.TXT
90	6	3	V	2	1	2024	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC5.TXT
91	7	3	V	2	1	2024	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC5.TXT
92	1	4	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC1.TXT
93	2	4	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC2.TXT
94	3	4	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC3.TXT
95	4	4	V	2	1	2024	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC4.TXT
96	5	4	V	2	1	2024	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC4.TXT
97	6	4	V	2	1	2024	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC5.TXT
98	7	4	V	2	1	2024	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC5.TXT
99	1	5	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC1.TXT
100	2	5	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC2.TXT
101	3	5	V	2	1	2024	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC3.TXT
102	4	5	V	2	1	2024	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC4.TXT
103	5	5	V	2	1	2024	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC4.TXT
104	6	5	V	2	1	2024	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC5.TXT
105	7	5	V	2	1	2024	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2022_DS_UC5.TXT
106	1	1	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC1.TXT
107	2	1	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC2.TXT
108	3	1	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC3.TXT
109	4	1	V	2	1	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC4.TXT
110	5	1	V	2	1	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC4.TXT
111	6	1	V	2	1	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC5.TXT
112	7	1	V	2	1	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\AM_2037_DS_UC5.TXT
113	1	2	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC1.TXT
114	2	2	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC2.TXT
115	3	2	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC3.TXT
116	4	2	V	2	1	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC4.TXT
117	5	2	V	2	1	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC4.TXT
118	6	2	V	2	1	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC5.TXT
119	7	2	V	2	1	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\PM_2037_DS_UC5.TXT
120	1	3	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC1.TXT
121	2	3	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC2.TXT
122	3	3	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC3.TXT
123	4	3	V	2	1	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC4.TXT
124	5	3	V	2	1	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC4.TXT
125	6	3	V	2	1	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC5.TXT
126	7	3	V	2	1	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC5.TXT

127	1	4	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC1.TXT
128	2	4	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC2.TXT
129	3	4	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC3.TXT
130	4	4	V	2	1	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC4.TXT
131	5	4	V	2	1	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC4.TXT
132	6	4	V	2	1	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC5.TXT
133	7	4	V	2	1	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC5.TXT
134	1	5	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC1.TXT
135	2	5	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC2.TXT
136	3	5	V	2	1	2037	1	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC3.TXT
137	4	5	V	2	1	2037	0.12	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC4.TXT
138	5	5	V	2	1	2037	0.88	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC4.TXT
139	6	5	V	2	1	2037	0.24	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC5.TXT
140	7	5	V	2	1	2037	0.27	C:\A582\TUBA\D - Core - VDMv2\Skims\IP_2037_DS_UC5.TXT
141	1	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME1.TXT
142	2	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME2.TXT
143	3	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME3.TXT
144	4	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME4.TXT
145	5	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME4.TXT
146	6	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME5.TXT
147	7	1	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_TIME5.TXT
148	1	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME1.TXT
149	2	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME2.TXT
150	3	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME3.TXT
151	4	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME4.TXT
152	5	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME4.TXT
153	6	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME5.TXT
154	7	2	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_TIME5.TXT
155	1	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME1.TXT
156	2	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME2.TXT
157	3	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME3.TXT
158	4	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME4.TXT
159	5	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME4.TXT
160	6	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME5.TXT
161	7	3	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME5.TXT
162	1	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME1.TXT
163	2	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME2.TXT
164	3	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME3.TXT
165	4	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME4.TXT
166	5	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME4.TXT
167	6	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME5.TXT
168	7	4	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME5.TXT
169	1	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME1.TXT
170	2	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME2.TXT
171	3	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME3.TXT
172	4	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME4.TXT
173	5	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME4.TXT
174	6	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME5.TXT
175	7	5	T	2	0	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_TIME5.TXT
176	1	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME1.TXT
177	2	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME2.TXT
178	3	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME3.TXT
179	4	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME4.TXT
180	5	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME4.TXT
181	6	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME5.TXT
182	7	1	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_AM_TIME5.TXT
183	1	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME1.TXT
184	2	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME2.TXT
185	3	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME3.TXT
186	4	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME4.TXT
187	5	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME4.TXT
188	6	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME5.TXT
189	7	2	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_PM_TIME5.TXT
190	1	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME1.TXT
191	2	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME2.TXT
192	3	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME3.TXT
193	4	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME4.TXT
194	5	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME4.TXT
195	6	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME5.TXT
196	7	3	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME5.TXT
197	1	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME1.TXT
198	2	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME2.TXT
199	3	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME3.TXT
200	4	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME4.TXT
201	5	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME4.TXT
202	6	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME5.TXT
203	7	4	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME5.TXT
204	1	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME1.TXT
205	2	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME2.TXT

206	3	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME3.TXT
207	4	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME4.TXT
208	5	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME4.TXT
209	6	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME5.TXT
210	7	5	T	2	0	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2037_IP_TIME5.TXT
211	1	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME1.TXT
212	2	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME2.TXT
213	3	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME3.TXT
214	4	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME4.TXT
215	5	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME4.TXT
216	6	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME5.TXT
217	7	1	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_AM_TIME5.TXT
218	1	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME1.TXT
219	2	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME2.TXT
220	3	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME3.TXT
221	4	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME4.TXT
222	5	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME4.TXT
223	6	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME5.TXT
224	7	2	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_PM_TIME5.TXT
225	1	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME1.TXT
226	2	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME2.TXT
227	3	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME3.TXT
228	4	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME4.TXT
229	5	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME4.TXT
230	6	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME5.TXT
231	7	3	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME5.TXT
232	1	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME1.TXT
233	2	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME2.TXT
234	3	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME3.TXT
235	4	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME4.TXT
236	5	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME4.TXT
237	6	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME5.TXT
238	7	4	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME5.TXT
239	1	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME1.TXT
240	2	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME2.TXT
241	3	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME3.TXT
242	4	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME4.TXT
243	5	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME4.TXT
244	6	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME5.TXT
245	7	5	T	2	1	2024	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2022_IP_TIME5.TXT
246	1	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME1.TXT
247	2	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME2.TXT
248	3	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME3.TXT
249	4	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME4.TXT
250	5	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME4.TXT
251	6	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME5.TXT
252	7	1	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_AM_TIME5.TXT
253	1	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME1.TXT
254	2	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME2.TXT
255	3	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME3.TXT
256	4	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME4.TXT
257	5	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME4.TXT
258	6	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME5.TXT
259	7	2	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_PM_TIME5.TXT
260	1	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME1.TXT
261	2	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME2.TXT
262	3	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME3.TXT
263	4	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME4.TXT
264	5	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME4.TXT
265	6	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME5.TXT
266	7	3	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME5.TXT
267	1	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME1.TXT
268	2	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME2.TXT
269	3	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME3.TXT
270	4	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME4.TXT
271	5	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME4.TXT
272	6	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME5.TXT
273	7	4	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME5.TXT
274	1	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME1.TXT
275	2	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME2.TXT
276	3	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME3.TXT
277	4	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME4.TXT
278	5	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME4.TXT
279	6	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME5.TXT
280	7	5	T	2	1	2037	0.00028	C:\A582\TUBA\D - Core - VDMv2\Skims\DS_2037_IP_TIME5.TXT
281	1	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST1.TXT
282	2	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST2.TXT
283	3	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST3.TXT
284	4	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST4.TXT

285	5	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST4.TXT
286	6	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST5.TXT
287	7	1	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_AM_DIST5.TXT
288	1	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST1.TXT
289	2	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST2.TXT
290	3	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST3.TXT
291	4	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST4.TXT
292	5	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST4.TXT
293	6	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST5.TXT
294	7	2	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_PM_DIST5.TXT
295	1	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST1.TXT
296	2	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST2.TXT
297	3	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST3.TXT
298	4	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST4.TXT
299	5	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST4.TXT
300	6	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST5.TXT
301	7	3	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST5.TXT
302	1	4	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST1.TXT
303	2	4	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST2.TXT
304	3	4	D	2	0	2024	0.001	C:\A582\TUBA\D - Core - VDMv2\Skims\DM_2022_IP_DIST3.TXT
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Appendix G. Personal Injury Accidents

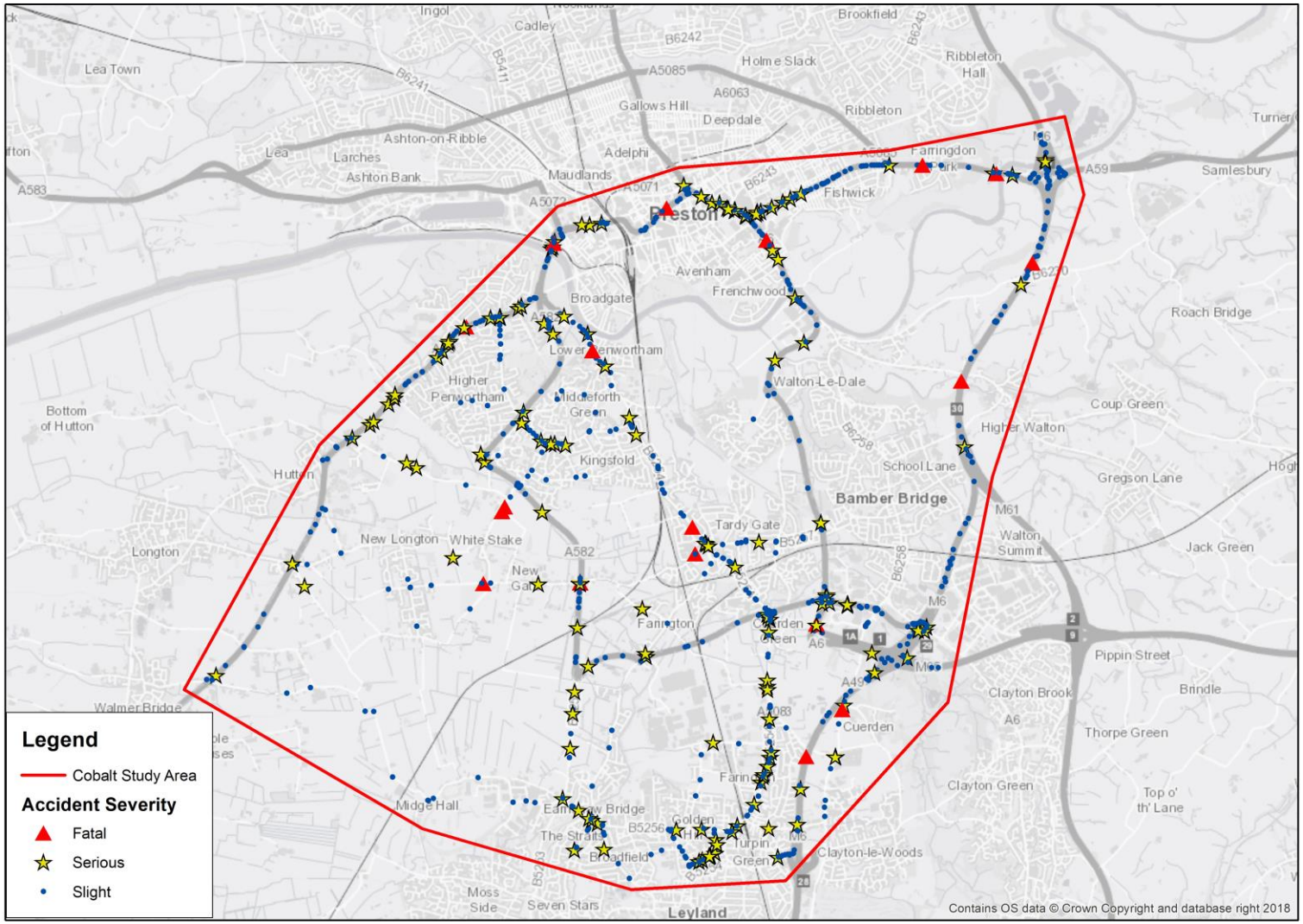

Figure G.1: Accident Plots

Appendix H. A582 South Ribble Western Distributor Economic Narrative

H.1 Context of Scheme

H.1.1 Introduction

Improvements to the road network can affect economic growth in a number of ways such as raising productivity, enabling new developments, facilitating trade and supporting employment. The mechanisms by which a given scheme will impact the economy will therefore differ depending on the scheme itself and its local context. As a consequence, the methods by which schemes' impacts on the economy should be appraised need to be determined on a case-by-case basis.

This Economic Narrative for the A582 South Ribble Western Distributor scheme explores the context of the local economy and justifies why the scheme is needed to achieve the economic objectives set out in the Strategic Case. It identifies what impacts the scheme is expected to have, lists which impacts are being assessed and defines the methodologies used to do so.

H.1.2 Context of the Local Economy

H.1.2.1 Introduction

Lancashire has one of the largest local economies in the North of England. In its Strategic Economic Plan produced in 2014, Lancashire's economy was valued at over £23 billion, and was described as being home to over 40,000 businesses employing in excess of 600,000 people, with a total population of 1.4m.

Although Lancashire has experienced sustained growth in the last decade, with readily identifiable economic 'hotspots' such as the cities of Preston and Lancaster, the area's average performance still consistently lags behind that of the UK and neighbouring city regions. The Strategic Economic Plan reports that, between 2007 and 2011, Lancashire's economy grew by 4.4% compared to 6.5% nationally and 4.9% regionally.

A summary of previously identified issues in terms of productivity and housing growth is provided in the sections below.

H.1.2.2 Productivity and Employment Growth

The Strategic Economic Plan reported that the economic performance of Lancashire is more than 20% below the national average, in terms of GVA per resident. Without strategic interventions Lancashire's GVA gap with the rest of the country is predicted to increase. This will exacerbate the existing long-term trend and further deepen Lancashire's productivity and income gaps.

Over the recent decades, Lancashire has failed to deliver the critical transport infrastructure needed to support business success. The Strategic Economic Plan estimated that this accounts for one-quarter of the current economic performance gap with the rest of the UK.

Preston city region, which includes employment sites in South Ribble, is a major employment hub. It therefore acts as a large net importer of labour from across Lancashire as well as driving significant internal movements. According to 2011 Census Journey to Work data, there is a net total inflow of 16,580 commuting trips to Preston and South Ribble combined, while there are 70,236 commuting trips within and between the two districts. However, the limited capacity of the road network results in congestion. This is especially severe at peak commuting times.

Figure H.1 below shows some of the traffic demand drivers in Preston and South Ribble. The main cluster of economic activity in South Ribble is centred around the A582 corridor, with the Walton Summit Centre and South Rings Business Park to the East around the M6/M65/M61 triangle and the Lancashire and Leyland Business Parks between Lostock Hall and Leyland as the main economic centres. The proposed Cuerden Strategic Site sits between these two clusters adjacent to the M65 terminus roundabout. The main areas of high-density working age residents are in the settlements of Lostock Hall, Bamber Bridge and the south of Penwortham to the North of the A582, and Leyland to the South of the district.

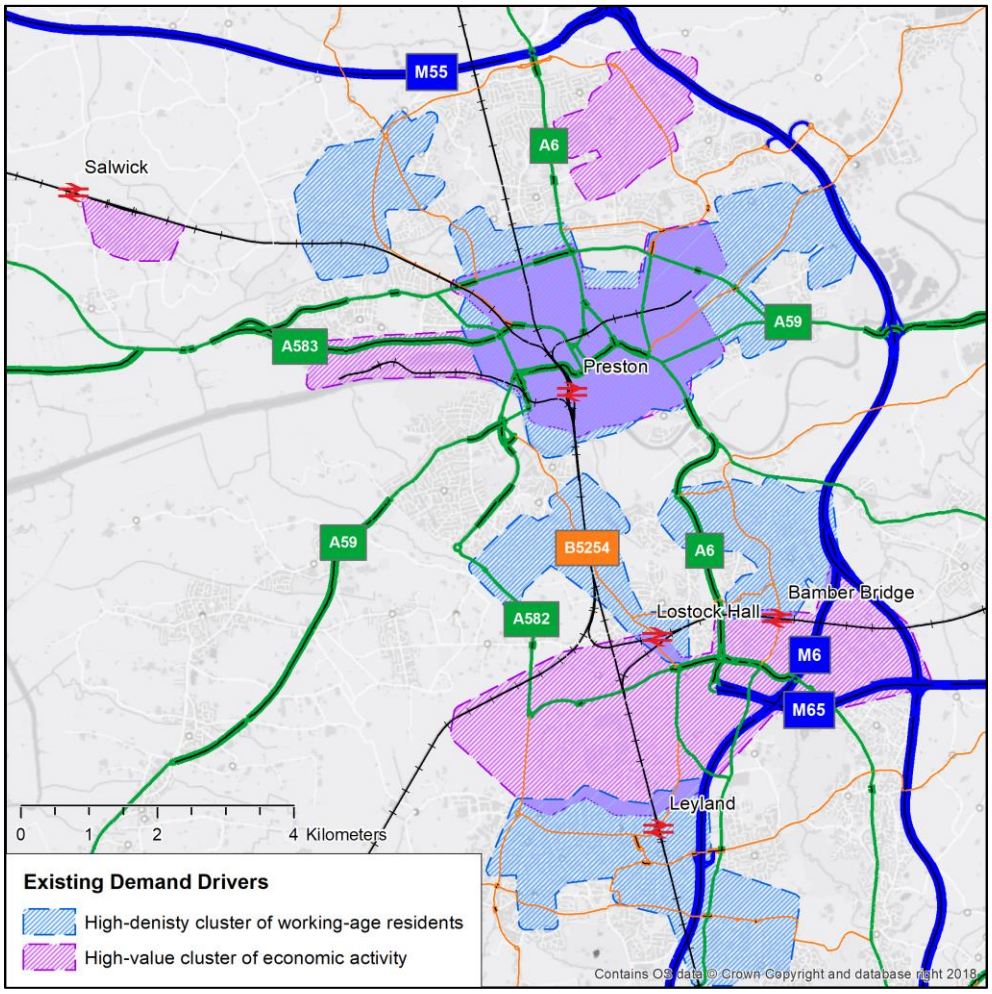

Figure H.1: Internal drivers of traffic movements within the Preston City Region

New strategic employment sites are required to provide the expansion of light industrial and logistics-based businesses in TfN's advanced manufacturing prime capability. Lancashire has ambitious plans to create thousands of jobs, including significant clusters of employment growth in South Ribble. These include intensification at existing sites, as well as expansion of existing business parks onto surrounding sites. One of the scheme's key objectives is to support the development of Cuerden Strategic Employment Site.

Much of this significant employment growth is therefore centered around the A582 corridor, and will be reliant on it to provide connectivity to central Preston, the SRN and other employment sites. The employment sites are spatially separated from residential areas and housing growth sites, with the A582 being the primary corridor that links the houses and jobs together.

These sites will drive significantly increased demand on the transport network in South Ribble, particularly on the A582. Employment sites may face difficulty in attracting skilled labour due to the problems of commuting on a congested network.

H.1.2.3 Housing Growth

Another primary objective of the scheme is to support local economic growth by supporting the delivery of housing sites accommodating over 2,700 new dwellings south of Preston. This is a significant contribution to meeting the area's future housing needs and is central to economic growth objectives.

One of the housing locations identified is the Pickering's Farm strategic housing location. This is an extension to Penwortham with 1,350 new dwellings allocated in the South Ribble Local Plan to meet the demand for local housing. To best achieve this scale of development and further future development, the SRWD is needed to provide sufficient highway capacity in the immediate vicinity of the site. The SRWD will also reduce congestion on alternate routes through the area, enabling the delivery of sustainable transport schemes which will further support the delivery of Pickering's Farm and other developments

H.2 Identification and Justification of Expected Economic Impacts

Transport investments can have many varied economic impacts. This Economic Narrative aims to identify and justify all significant impacts which are expected to occur as a result of the scheme under consideration. The expected impacts should be justified on the basis of economic theory and evidence specific to the area affected by the transport scheme.

In addition to the quality of the analytical methods, the robustness and relevance of the economic theory and context specific evidence, used to identify and justify the expected economic impacts, will inform the weight placed on the analysis within the value for money assessment.

TAG Units A2.2 – A2.4 provide guidance on the type of information which could be presented in an Economic Narrative for the identification and justification of economic impacts.

The remainder of this chapter identifies the significant impacts expected as a result of the SRWD scheme.

H.2.1 Productivity Impacts

Increasing productivity is a national priority. Productivity is the key long-term determinant of the rate of economic growth, and the UK continues to face a significant productivity gap compared with other industrial nations. As well as this, as identified in Section H.1.2 of this report Lancashire faces an additional productivity gap compared with the rest of the UK.

Transport is key for improving the productivity of businesses. The link between investing in transport infrastructure and enabling economic growth through increasing productivity is supported by academic and applied research. Lancashire's Strategic Economic Plan identified the lack of transport investment and increasing congestion as a major reason for the local productivity problems.

One way in which transport investment can improve productivity is by providing businesses with better links to other businesses and sources of labour. The effect of this increase in 'economic density' is known as agglomeration.

The SRWD scheme is expected to reduce travel costs, and therefore increase economic density. As a result, there are likely to be increases in productivity due to agglomeration impacts. Where agglomeration is assessed based on reducing travel costs only, and without considering explicit changes in the location of economic activity, it is labelled in TAG Unit A2 as 'static clustering'.

Agglomeration impacts are likely to be greater from transport improvements near already densely clustered urban centres. TAG Unit A2 identifies a number of 'Functional Urban Regions' and schemes that fall within or nearby these areas are more likely to receive agglomeration benefits. The A582 scheme lies within the Preston Functional Urban Region as shown in Appendix A of TAG Unit A2.4.

Agglomeration impacts will therefore be assessed.

H.2.2 Labour Supply Impacts

TAG Unit A2.3 identifies labour supply impacts as being likely to occur when transport is a barrier to employment. This can occur when an area has poor connections to employment centres and / or high transport costs relative to incomes.

As commuting costs fall following the introduction of the SRWD scheme, some people who had been priced out of the labour market by high commuting costs would now be able to seek employment. The additional employment generated would add value to the scheme.

Labour supply impacts will therefore be assessed.

H.2.3 Induced Investment – Output Change in Imperfectly Competitive Markets

Output change in imperfectly competitive markets refers to changes in the level of economic activity as a result of transport investment. A reduction in generalised travel costs will induce investment and hence output. However, in an imperfectly competitive market, the value of the output is greater than the costs of production. The value of the resulting increased output is therefore not fully captured by the magnitude of the change in travel costs. Business user benefits therefore fail to capture the total value of the output change.

TAG Unit A2.2 provides examples of 'market failures', the presence of which would indicate an imperfectly competitive market. These include

- Imperfect Competition (Product markets): e.g. when markets are dominated by a small number of business.
- Tax Distortions: e.g. when companies adjust efficiency to adjust taxes payable.
- Imperfect Competition (Land markets) e.g. when land is owned by a small number of land owners.
- Co-ordination Failure: e.g. when multiple developers each under-invest in local transport improvements.
- Land Rationing: e.g. when policies (public or private) artificially limit the area of land available for development.

In the context of the A582 scheme, a significant proportion of the business user benefits accrue to freight. Within this market, a small number of large companies appear to have a significant proportion of the market. It is therefore likely that the scheme will result in output change that should be captured above the standard business user benefits.

Output change in imperfectly competitive markets will therefore be assessed.

H.2.4 Induced Investment: Dependent Development

Investment in housing and businesses may be facilitated by reducing transport costs and long-term commitments to transport investment allow for private investment to respond.

There are two developments in the study area which are considered to be specifically dependent on the scheme.

- "Pickerings Farm" – a residential development of 1,350 dwellings

- "Cuerden Strategic Site" – an employment development with a site area of up to 65 hectares

Both sites are identified in the City Deal as essential to unlocking the city region's economic growth potential, and both are reliant on future improvement of the transport network which will be provided by the City Deal schemes (one of which is A582 SRWD). Full details on these developments, and why they are considered to depend on the SRWD scheme, are provided in the A582 SRWD Economic Assessment Report (July 2019). Valuation of the Welfare Effects of Economic Impacts

H.2.5 Identification of Welfare Impacts

The appraisal process used to assess the A582 SRWD is based on the principles of the HMT Green Book guidance, which advocates the use of cost-benefit (welfare) analysis to determine the value for money of investment spend. Welfare analysis captures a broad range of impacts, such as economic, environmental and social. The results of welfare analysis are reported in the Economic Case and inform the value for money assessment.

Within welfare analysis, economic impacts are primarily captured by the estimation of user benefits. Under a well-defined set of circumstances user benefits will capture the entire welfare impact of a transport investment. However, as described in this Economic Narrative, several market failures have been identified which will lead to additional welfare impacts that should be captured.

As described above, the following wider economic impacts are expected to occur:

- Productivity improvements due to agglomeration impacts ('static clustering');
- Labour supply impacts;
- Increased business output ('output change in imperfectly competitive markets'); and
- Facilitating Investment ('dependent development').

The first three of these impacts are consistent with the 'Level 2 – Implicit Land Use Change' level of analysis defined in Table 2 of TAG Unit A2.1 (shown in Table H.1 below).

Benefits from 'dependent development' – as listed in the 'Level 3' level of analysis – will also be captured. However, the other impacts identified within Level 3 will not be assessed.

Table 2 - Relationships between Wider Economic Impacts, Levels of Analysis and Land Use assumptions			
	Level 1 (Initial BCR)	Level 2 (Adjusted BCR)	Level 3 (Indicative Monetised Impacts or Non-Monetised Impacts)
Fixed Land Use	User benefits →		→
		Static Clustering →	→
Implicit Land Use Change		Output Change in Imperfectly Competitive Markets →	→
		Labour Supply Impacts →	→
Explicit Land Use Change			Dependent Development
			Move to More/Less Productive Jobs
			Dynamic Clustering
			Supplementary Economic Modelling

***Note that the arrows signify the previous levels of analysis are required**

Table H.1: Levels of Analysis

H.2.6 Methodologies to quantify and value the impacts

This section of the report identifies the effect that the expected economic impacts described above will have on welfare. It also describes methodologies to assess them. Table H.2 provides a summary of assessment methodology.

Impact	Assessment Methodology
Productivity improvements due to agglomeration impacts ('static clustering')	Captured using DfT's standard WITA software, based on methodology defined in TAG Unit A2.4
Labour supply impacts	Captured using DfT's standard WITA software. Based on methodology defined in TAG Unit A2.3
Output change in imperfectly competitive markets	Calculated as 10% of Business and Freight User Benefits, as per TAG Unit A2.2 para 4.3.1
Dependent development	Calculated using 'Land Value Uplift' methodology defined in TAG Unit A2.2

Table H.2: Welfare Valuation Methodology

Details of the assessment methodology and results for each impact are provided in the Economic Assessment Report.

Appendix I. Sector to Sector Analysis of TUBA Benefits

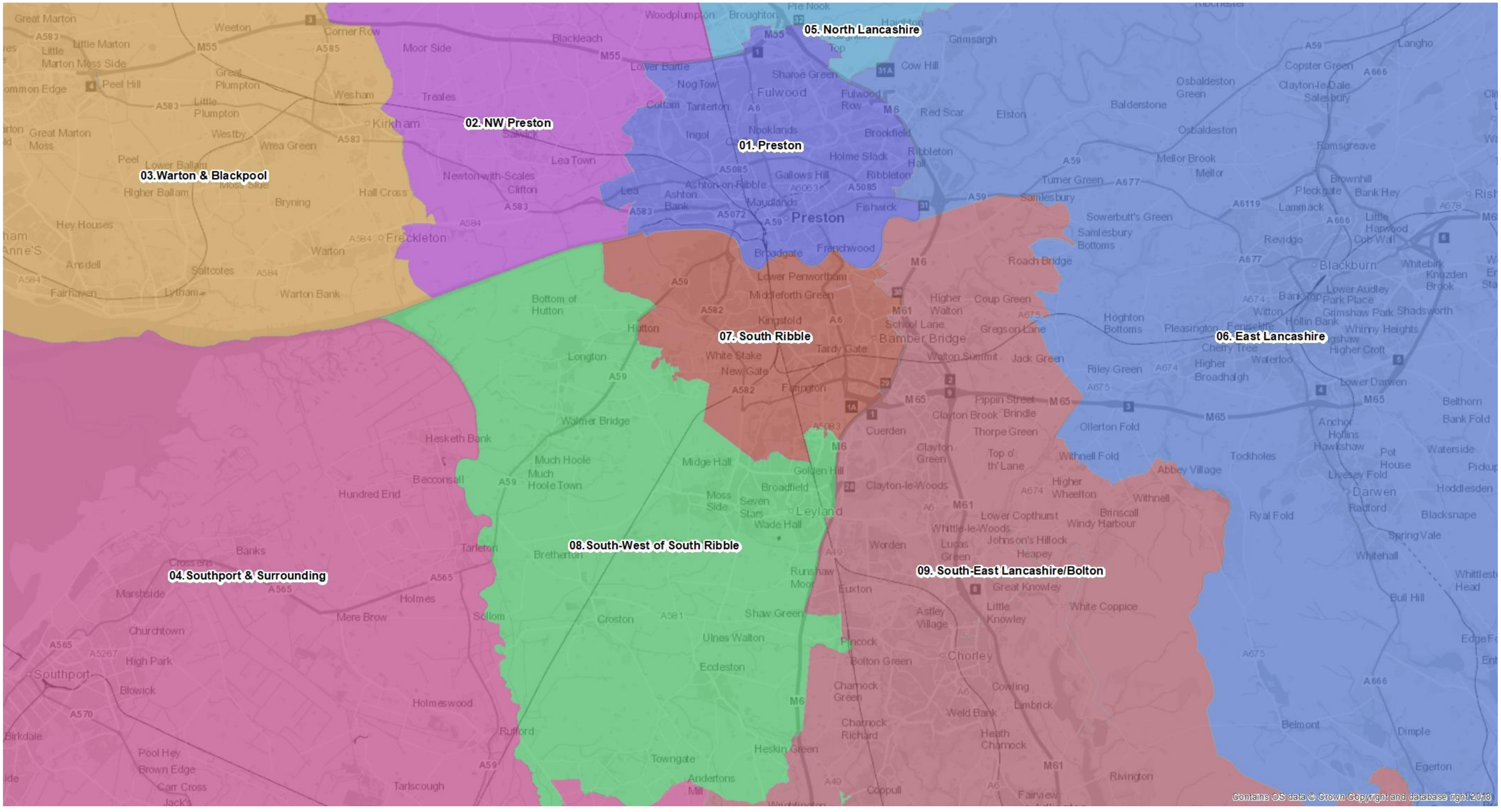

Figure I.1: Sector Map

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Table I.1: Sector-to-Sector Benefits: Total Benefits

	01. Preston	02. NW Preston	03.Warton & Blackpool	04.Southport & Surrounding	05. North Lancashire	06. East Lancashire	07. South Ribble	08.South-West of South Ribble	09. South-East Lancashire/Bolton	10. GB north	11. GB south	Grand Total
01. Preston	3,095,703	224,236	1,902,757	647,172	324,065	3,248,116	3,232,441	8,830,884	2,604,464	574,654	1,910,974	26,595,466
02. NW Preston	27,813	3,334	47,509	23,811	17,236	37,045	177,226	277,071	36,622	19,008	52,894	719,569
03.Warton & Blackpool	-600,366	-142,109	-305,389	-288,908	22,324	191,946	1,027,504	1,440,554	173,200	93,133	427,206	2,039,095
04.Southport & Surrounding	562,739	29,909	450,593	14,715	31,566	645,404	70,495	101,385	309,550	335,520	18,318	2,570,194
05. North Lancashire	33,655	7,716	95,433	80,487	1,800	31,380	42,751	522,394	11,843	5,226	31,639	864,324
06. East Lancashire	160,270	35,368	276,674	687,696	43,029	-77,434	710,879	3,990,886	-373,872	-11,787	-298,200	5,143,509
07. South Ribble	3,648,889	94,101	366,428	349,952	76,313	3,065,885	2,786,143	3,874,812	3,045,289	1,150,682	2,116,906	20,575,400
08.South-West of South Ribble	4,990,954	193,503	1,305,113	194,411	296,013	3,464,533	2,675,068	751,573	5,448,877	2,211,262	3,407,684	24,938,991
09. South-East Lancashire/Bolton	1,664,173	47,272	185,283	133,332	46,872	-354,217	1,633,122	5,755,517	-282,702	-139,291	-197,863	8,491,498
10. GB north	194,406	12,661	61,151	439,793	10,959	-97,161	330,778	1,959,956	-205,080	568	-153,241	2,554,790
11. GB south	893,135	56,489	494,992	-3,083	112,094	-371,543	767,802	2,132,592	25,560	21,265	44,507	4,173,810
Grand Total	**14,671,371**	**562,480**	**4,880,544**	**2,279,378**	**982,271**	**9,783,954**	**13,454,209**	**29,637,624**	**10,793,751**	**4,260,240**	**7,360,824**	**98,666,646**

	Min	Max
Benefits between	#########	#######
Benefits between	-1,000,000	-10,000
Benefits between	-10,000	10,000
Benefits between	10,000	######
Benefits between	1,000,000	######

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Table I.2: Sector-to-Sector Benefits: AM Benefits

	01. Preston	02. NW Preston	03.Warton & Blackpool	04.Southport & Surrounding	05. North Lancashire	06. East Lancashire	07. South Ribble	08.South-West of South Ribble	09. South-East Lancashire/ Bolton	10. GB north	11. GB south	Grand Total
01. Preston	421,822	46,093	391,942	134,045	40,158	445,543	463,604	2,026,300	360,719	43,131	337,633	4,710,990
02. NW Preston	48,472	2,197	12,813	16,603	5,019	6,876	48,547	113,710	3,587	3,290	10,722	271,836
03.Warton & Blackpool	96,975	8,218	-107,554	140,972	2,076	-13,451	443,261	602,745	-6,383	816	38,261	1,205,936
04.Southport & Surrounding	164,392	1,924	35,179	7,479	5,032	240,210	85,839	43,072	178,070	69,067	6,182	836,446
05. North Lancashire	20,567	2,038	30,225	17,745	805	1,360	30,857	183,395	-2,275	1,797	3,669	290,183
06. East Lancashire	670,004	10,891	92,094	169,929	15,021	-17,959	286,625	1,547,880	-216,475	27,858	-198,372	2,387,496
07. South Ribble	1,043,314	11,184	-38,749	35,001	-21,436	970,698	677,152	1,571,804	401,931	237,350	314,735	5,202,984
08.South-West of South Ribble	1,257,676	48,279	153,943	68,273	59,759	1,130,744	935,062	235,133	1,633,457	719,417	918,181	7,159,924
09. South-East Lancashire/Bolton	1,554,998	30,636	144,654	56,895	24,907	-112,564	1,238,597	2,668,253	-98,929	92,437	-32,082	5,567,802
10. GB north	110,348	3,409	41,238	115,746	3,258	-27,204	188,602	674,073	-56,449	-585	33,805	1,086,241
11. GB south	1,175,822	17,102	285,907	3,369	38,853	-136,319	280,729	703,318	99,389	70,363	1,051	2,539,584
Grand Total	**6,564,390**	**181,971**	**1,041,692**	**766,057**	**173,452**	**2,487,934**	**4,678,875**	**10,369,683**	**2,296,642**	**1,264,941**	**1,433,785**	**31,259,422**

	Min	Max
Benefits between	-2,700,000	#######
Benefits between	-270,000	-2,700
Benefits between	-2,700	2,700
Benefits between	2,700	#######
Benefits between	270,000	#######

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Table I.3: Sector-to-Sector Benefits: IP Benefits

	01. Preston	02. NW Preston	03.Warton & Blackpool	04.Southport & Surrounding	05. North Lancashire	06. East Lancashire	07. South Ribble	08.South-West of South Ribble	09. South-East Lancashire/Bolton	10. GB north	11. GB south	Grand Total
01. Preston	710,802	97,807	547,742	295,536	252,045	1,460,642	1,161,144	4,102,172	999,397	367,637	762,430	10,757,354
02. NW Preston	-24,493	737	4,201	7,997	2,504	8,556	76,339	119,390	3,955	3,497	11,361	214,044
03.Warton & Blackpool	-183,963	-3,638	2,555	95,355	3,944	42,699	388,486	768,048	23,545	38,507	85,151	1,260,689
04.Southport & Surrounding	254,597	16,645	278,583	3,760	15,373	313,233	-32,113	40,359	63,975	145,762	7,208	1,107,382
05. North Lancashire	7,218	968	7,647	50,903	603	10,952	-3,341	223,686	503	2,045	9,275	310,459
06. East Lancashire	-915,279	6,465	-18,798	382,647	3,360	-3,051	203,647	1,664,867	-74,769	-113,282	49,079	1,184,886
07. South Ribble	1,675,513	57,215	285,306	208,837	65,006	1,390,628	1,146,832	1,451,616	1,289,515	675,160	1,078,930	9,324,558
08.South-West of South Ribble	2,716,143	91,071	738,545	69,737	172,304	1,614,827	1,209,860	400,659	2,587,724	1,115,832	1,751,088	12,467,790
09. South-East Lancashire/Bolton	-337,640	-2,292	-84,288	37,374	-11,630	-100,736	50,687	2,100,180	42,090	-343,913	-15,807	1,334,025
10. GB north	-22,532	1,052	-13,770	261,005	3,979	-841	65,553	883,822	-11,007	2,429	-16,807	1,152,883
11. GB south	-646,490	-9,360	-244,587	-1,038	-39,609	-188,698	172,958	1,104,687	-28,117	-286,910	14,858	-152,306
Grand Total	3,233,876	256,670	1,503,136	1,412,113	467,879	4,548,211	4,440,052	12,859,486	4,896,811	1,606,764	3,736,766	38,961,764

	Min	Max
Benefits between	-4,200,000	#######
Benefits between	-420,000	-4,200
Benefits between	-4,200	4,200
Benefits between	4,200	#######
Benefits between	420,000	#######

Table I.4: Sector-to-Sector Benefits: PM Benefits

	01. Preston	02. NW Preston	03.Warton & Blackpool	04.Southport & Surrounding	05. North Lancashire	06. East Lancashire	07. South Ribble	08.South-West of South Ribble	09. South-East Lancashire/ Bolton	10. GB north	11. GB south	Grand Total
01. Preston	1,963,079	80,336	963,073	217,591	31,862	1,341,931	1,607,693	2,702,412	1,244,348	163,886	810,911	11,127,122
02. NW Preston	3,834	400	30,495	-789	9,713	21,613	52,340	43,971	29,080	12,221	30,811	233,689
03.Warton & Blackpool	-513,378	-146,689	-200,390	-525,235	16,304	162,698	195,757	69,761	156,038	53,810	303,794	-427,530
04.Southport & Surrounding	143,750	11,340	136,831	3,476	11,161	91,961	16,769	17,954	67,505	120,691	4,928	626,366
05. North Lancashire	5,870	4,710	57,561	11,839	392	19,068	15,235	115,313	13,615	1,384	18,695	263,682
06. East Lancashire	405,545	18,012	203,378	135,120	24,648	-56,424	220,607	778,139	-82,628	73,637	-148,907	1,571,127
07. South Ribble	930,062	25,702	119,871	106,114	32,743	704,559	962,159	851,392	1,353,843	238,172	723,241	6,047,858
08.South-West of South Ribble	1,017,135	54,153	412,625	56,401	63,950	718,962	530,146	115,781	1,227,696	376,013	738,415	5,311,277
09. South-East Lancashire/Bolton	446,815	18,928	124,917	39,063	33,595	-140,917	343,838	987,084	-225,863	112,185	-149,974	1,589,671
10. GB north	106,590	8,200	33,683	63,042	3,722	-69,116	76,623	402,061	-137,624	-1,276	-170,239	315,666
11. GB south	363,803	48,747	453,672	-5,414	112,850	-46,526	314,115	324,587	-45,712	237,812	28,598	1,786,532
Grand Total	**4,873,105**	**123,839**	**2,335,716**	**101,208**	**340,940**	**2,747,809**	**4,335,282**	**6,408,455**	**3,600,298**	**1,388,535**	**2,190,273**	**28,445,460**

	Min	Max
Benefits between	-2,702,412	#######
Benefits between	-270,241	-2,702
Benefits between	-2,702	2,702
Benefits between	2,702	#######
Benefits between	270,241	#######

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Table I.5: Sector-to-Sector Benefits: Time Benefits

	01. Preston	02. NW Preston	03.Warton & Blackpool	04.Southport & Surrounding	05. North Lancashire	06. East Lancashire	07. South Ribble	08.South-West of South Ribble	09. South-East Lancashire/Bolton	10. GB north	11. GB south	Grand Total
01. Preston	2,999,733	219,745	1,843,767	610,184	271,635	3,452,118	3,148,533	7,434,195	2,809,713	657,142	2,082,789	25,529,554
02. NW Preston	26,552	3,174	87,193	21,792	18,052	36,977	136,606	169,737	35,030	19,504	56,588	611,205
03.Warton & Blackpool	-623,374	-143,494	-297,241	-334,655	23,151	198,229	887,377	1,036,595	156,265	111,080	484,597	1,498,530
04.Southport & Surrounding	398,810	28,446	467,668	7,099	28,929	478,138	1,573	97,850	216,851	297,093	9,880	2,032,337
05. North Lancashire	-19,427	8,165	97,401	140,726	1,009	30,559	33,635	540,181	12,834	3,655	33,042	881,780
06. East Lancashire	279,116	30,138	271,695	630,366	46,038	-77,270	758,337	4,123,842	-412,364	-16,064	-352,147	5,281,687
07. South Ribble	3,565,261	96,963	211,159	320,335	76,508	3,199,790	2,850,290	3,794,919	3,021,121	1,190,680	2,330,552	20,657,578
08.South-West of South Ribble	4,909,154	138,983	1,247,220	166,411	285,858	3,691,958	2,987,766	833,149	5,840,349	2,597,978	4,084,076	26,782,902
09. South-East Lancashire/Bolton	1,894,834	42,730	68,787	55,056	48,099	-437,084	1,616,448	5,985,353	-319,230	-106,411	-203,637	8,644,945
10. GB north	296,875	14,237	11,361	400,077	10,441	-110,524	373,055	2,308,090	-213,412	0	-166,369	2,923,831
11. GB south	1,770,011	65,222	530,176	-2,650	119,940	-521,893	876,619	2,569,137	-3,103	41,586	0	5,445,045
Grand Total	**15,497,545**	**504,309**	**4,539,186**	**2,014,741**	**929,660**	**9,940,998**	**13,670,239**	**28,893,048**	**11,144,054**	**4,796,243**	**8,359,371**	**100,289,394**

	Min	Max
Benefits between	#########	#######
Benefits between	-1,000,000	-10,000
Benefits between	-10,000	10,000
Benefits between	10,000	#######
Benefits between	1,000,000	#######

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Table I.6: Sector-to-Sector Benefits: Sum of VOC Benefits

	01. Preston	02. NW Preston	03.Warton & Blackpool	04.Southport & Surrounding	05. North Lancashire	06. East Lancashire	07. South Ribble	08.South-West of South Ribble	09. South-East Lancashire/ Bolton	10. GB north	11. GB south	Grand Total
01. Preston	339,246	21,395	128,366	28,513	86,347	-388,947	115,890	1,503,778	-363,036	-84,745	-455,766	931,041
02. NW Preston	9,595	1,089	-49,444	-672	-508	-1,654	47,940	131,936	493	341	-10,524	128,592
03.Warton & Blackpool	102,943	13,214	32,544	76,146	-2,375	-29,455	64,704	413,345	5,449	-5,359	-187,780	483,376
04.Southport & Surrounding	178,416	804	-60,487	33,562	2,394	202,726	104,095	18,536	124,668	16,860	97,464	719,038
05. North Lancashire	77,716	-237	-2,940	-84,964	3,866	3,016	7,671	-68,572	1,261	10,512	10,527	-42,144
06. East Lancashire	-331,658	3,375	-28,449	36,959	-8,399	73,750	-87,775	-476,688	165,526	69,933	289,511	-293,915
07. South Ribble	152,940	1,526	285,436	43,223	5,579	-331,011	-77,906	64,027	-19,197	-103,455	-450,454	-429,292
08.South-West of South Ribble	-10,827	68,638	35,460	66,716	-3,410	-534,720	-448,103	58,514	-712,990	-853,498	-1,372,329	-3,706,549
09. South-East Lancashire/Bolton	-503,599	4,050	155,140	113,452	-3,619	220,094	-20,990	-470,424	149,879	91,141	159,390	-105,486
10. GB north	-226,014	-4,582	118,265	-13,765	6,803	82,437	-110,644	-940,880	96,366	31,141	176,512	-784,361
11. GB south	-1,867,818	-31,513	-141,562	6,344	-31,064	431,808	-293,856	-1,048,546	110,231	48,987	322,431	-2,494,558
Grand Total	**-2,079,060**	**77,759**	**472,329**	**305,514**	**55,614**	**-271,956**	**-698,974**	**-814,974**	**-441,350**	**-778,142**	**-1,421,018**	**-5,594,258**

	Min	Max
Benefits between	#########	#######
Benefits between	-1,000,000	#######
Benefits between	-10,000	10,000
Benefits between	10,000	#######
Benefits between	1,000,000	#######

Appendix J. Accident Benefits Plot

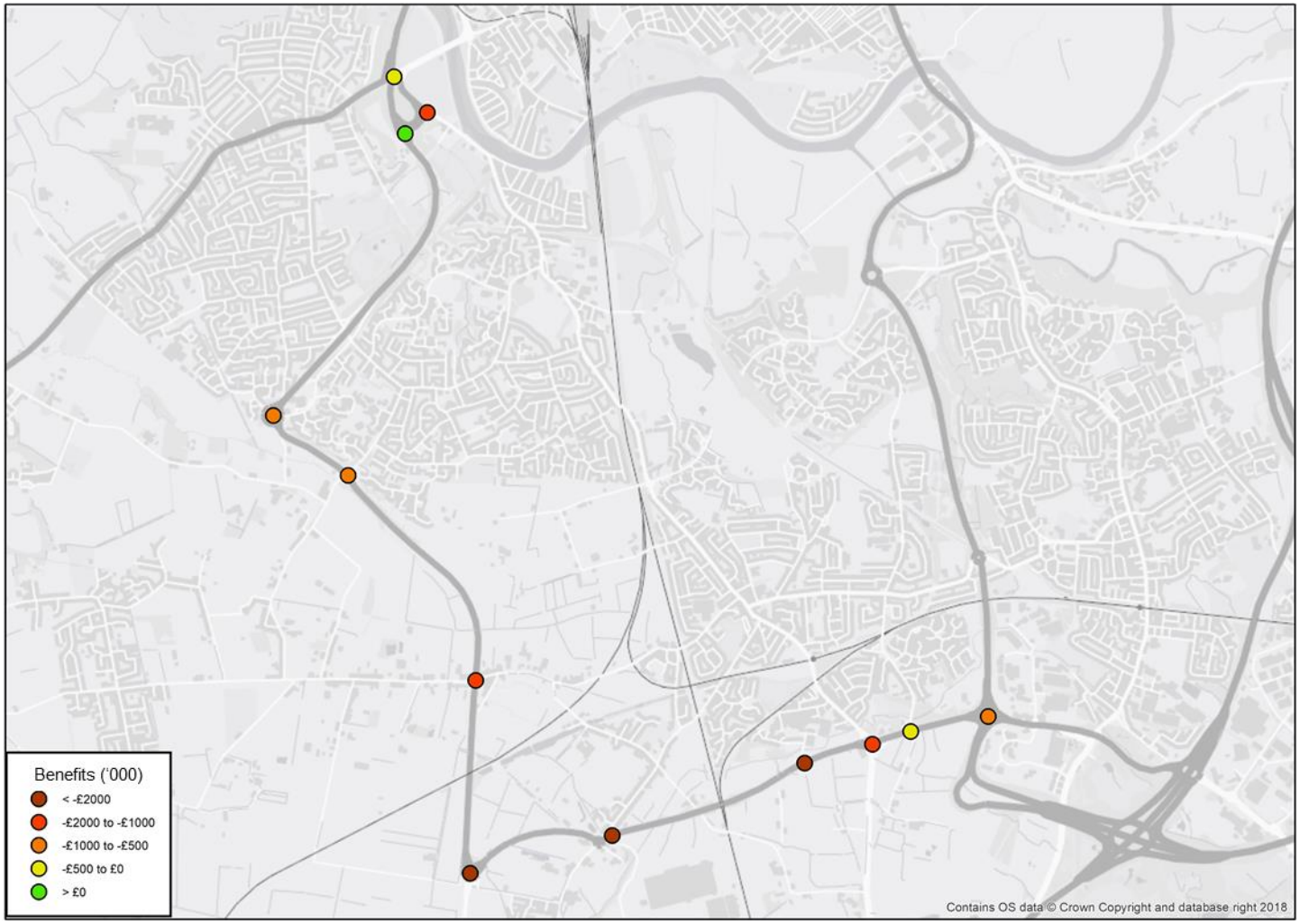


Figure J.1: Junction Benefits (000's)

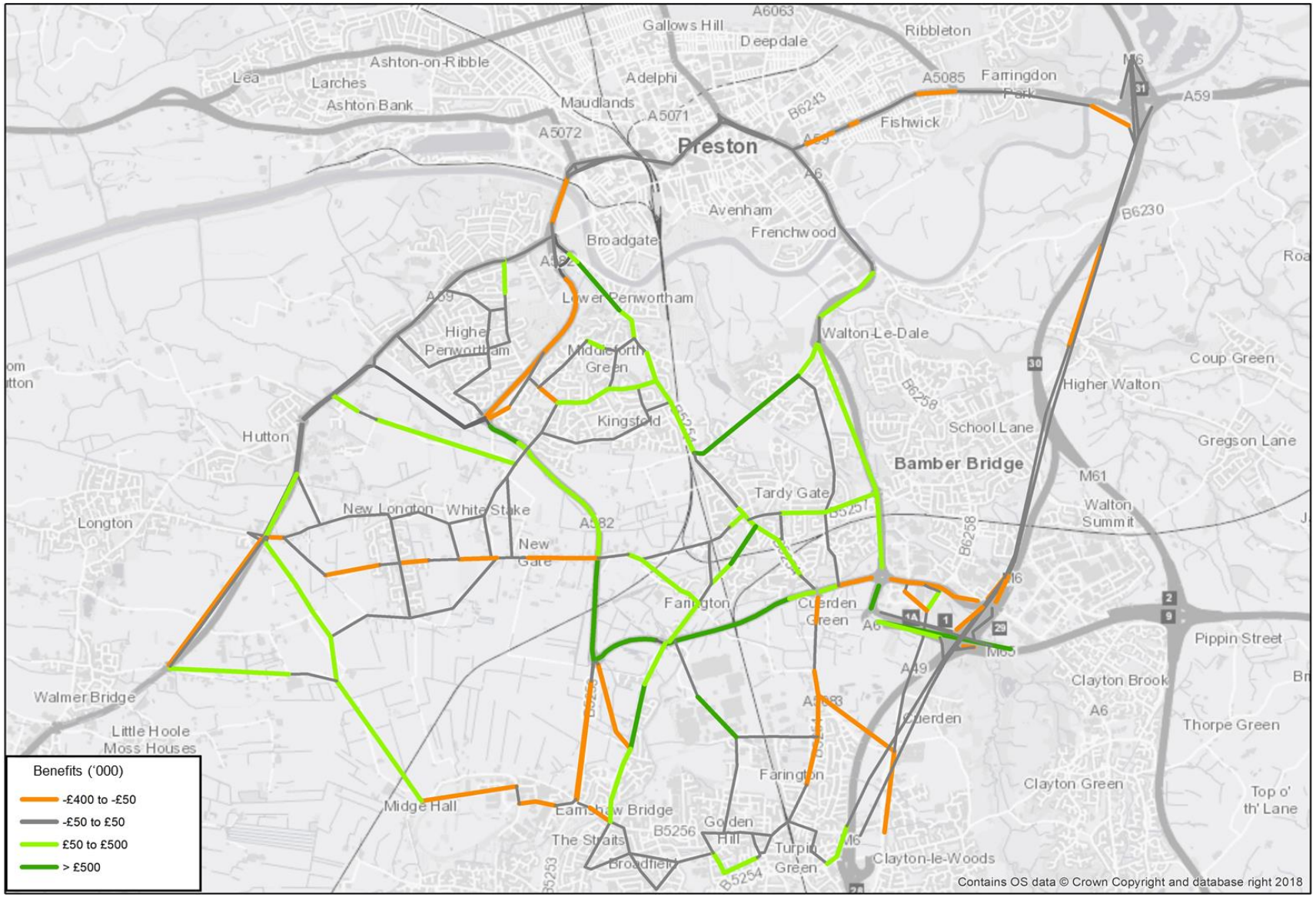


Figure J.2: Link Benefits (000's)

Appendix K. Unlocked Developments Technical Note

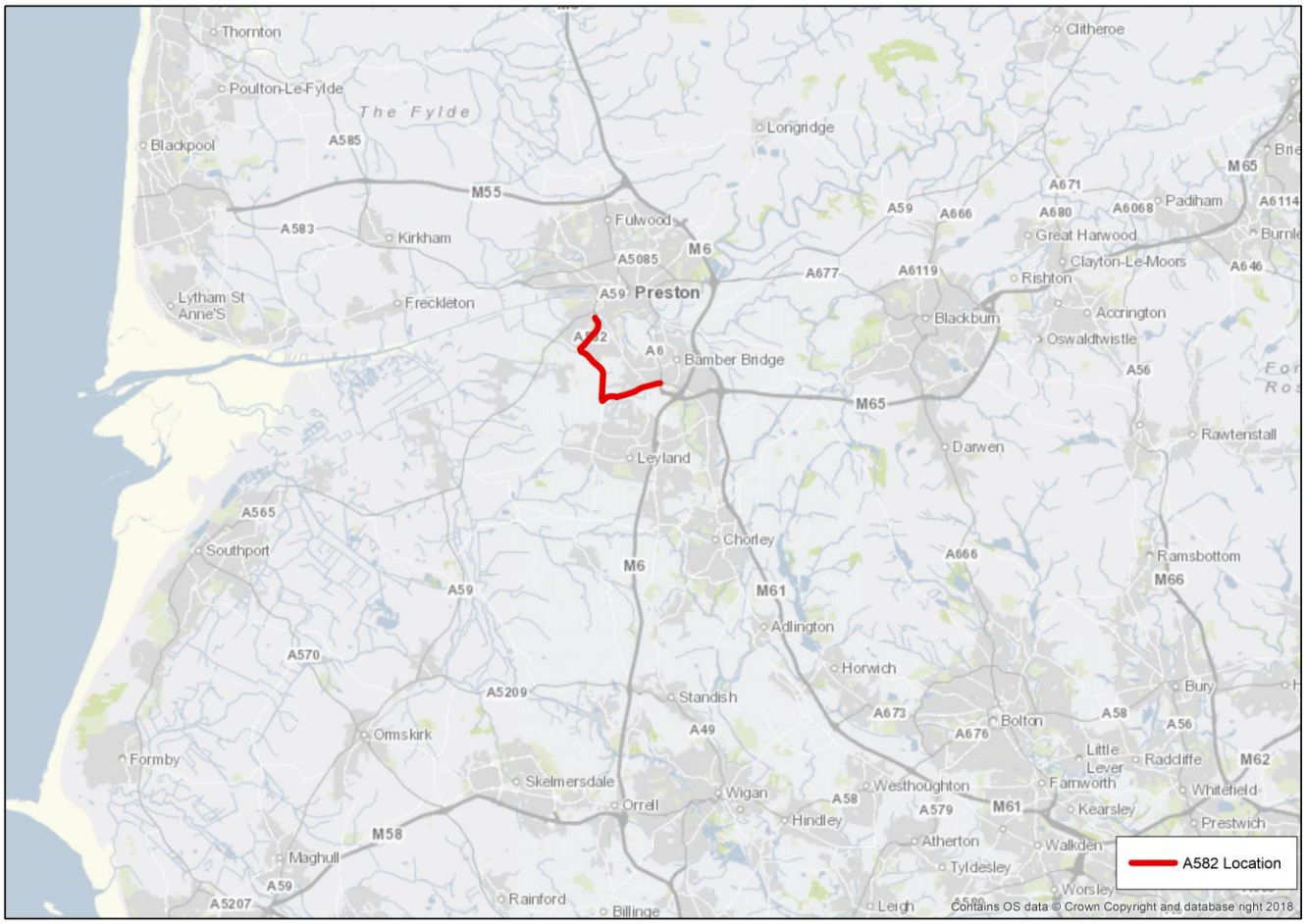
K.1 Background

The A582 South Ribble Western Distributor (SRWD) is located in Central Lancashire and is one of the radial routes connecting Preston with the M65 (Figure K.1). It is a modern standard, part single, part dual two-lane road with access generally restricted to major junctions that are either roundabouts or controlled by traffic signals, and a partial grade-separated junction providing a link with the local road network in the Cop Lane area of Penwortham.

The proposed scheme includes provision of a 5.2 km stretch of dual two-lane carriageway between its junction with the A5083 Stanifield Lane in Lostock Hall and the existing dual carriageway section from Broad Oak Roundabout (Penwortham) into Preston City Centre.

The scheme is expected to facilitate housing and employment growth in the area. The economic benefits of this are captured in the scheme's Economic Case. This technical note describes the assessment of these unlocked development benefits. The note acts as a supporting document to the Economic Assessment Report.

Figure K.1: A582 South Ribble Western Distributor Location



K.2 Unlocked Developments

To include the benefits from unlocking dependent developments within a transport scheme's business case, it must be proven that the development is truly dependent on the transport scheme. TAG Unit A2.2 (paragraph 3.1.5) defines dependent development as follows:

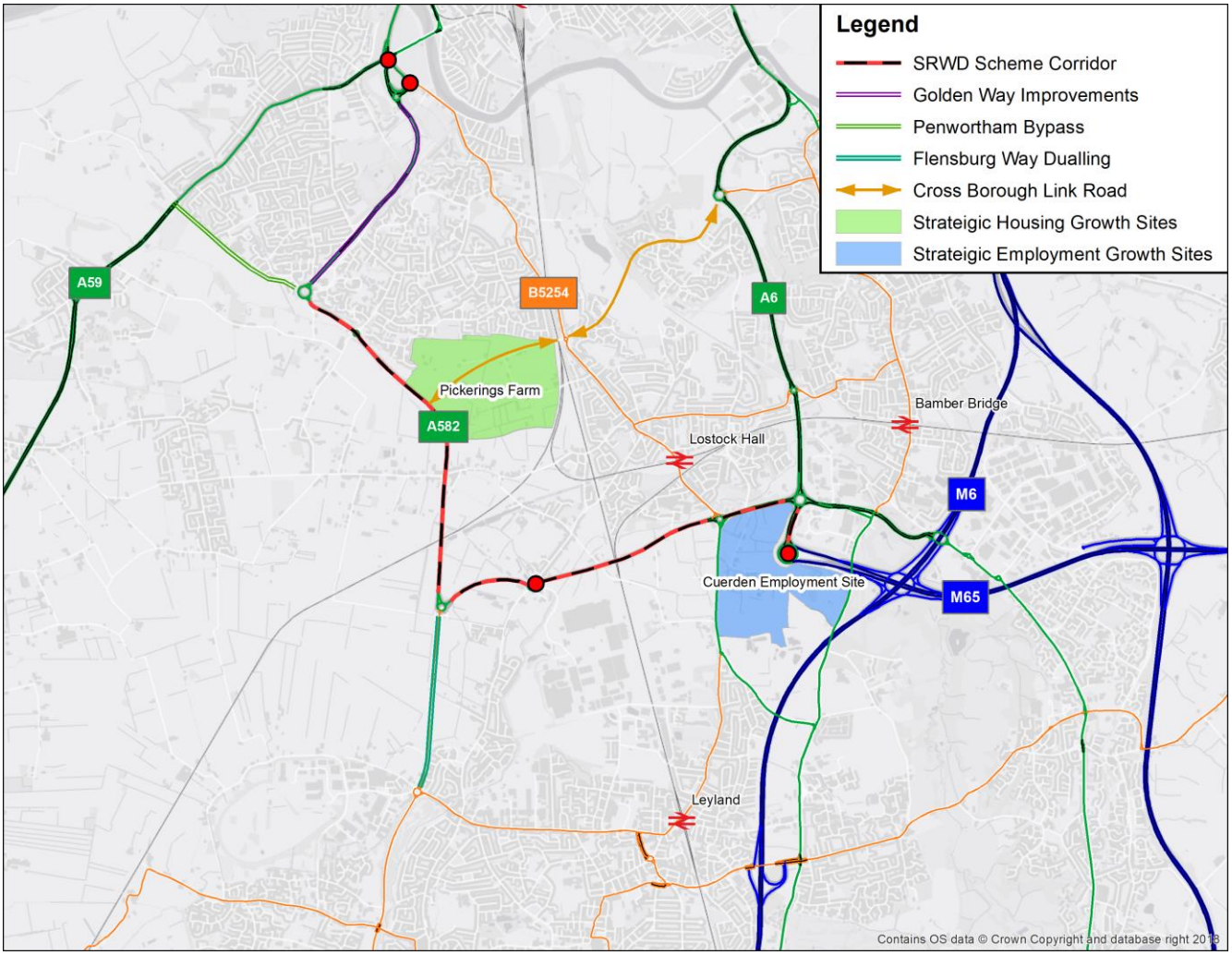
"Dependent development refers to a specific plot of land, which requires a complementary transport investment in order for a residential or non-residential development to proceed; in the absence of a transport scheme, the transport network would not provide a 'reasonable level' of service to new and/or existing users. The development may have planning permission conditional on a transport investment but this is not a prerequisite for it to be considered dependent."

There are two developments in the study area which are considered to be dependent on the scheme as shown in Figure K.2:

- "Pickerings Farm" – a residential development
- "Cuerden Strategic Site" – an employment development

Both sites are identified in the City Deal as essential to unlocking the city region's economic growth potential, and both are reliant on future improvement of the transport network which will be provided by the City Deal schemes (one of which is A582 SRWD). These developments are discussed in turn below.

Figure K.2: Unlocked Developments around A582



Pickerings Farm residential development

The Pickerings Farm residential development consists of **1,350 dwellings**. These dwellings are situated on the east of the Penwortham Way arm of the A582 scheme.

The Pickerings Farm development plans are being consulted on in June and July 2019.

Pickerings Farm is one of the commercial and housing schemes in the City Deal area which are supported by four major City Deal transport schemes, one of which is the A582 SRWD improvements. The South Ribble Local Plan (2012-2026) discusses the dependency of Pickerings Farm on the scheme:

"The upgrading of the A582 South Ribble Western Distributor to improve capacity on the existing A582 between Cuerden and Penwortham Triangle will support this development."

Pickering's Farm will be accessed through the A582 Penwortham Way North and B5254 Leyland. Traffic modelling shows that both these routes will be at or exceeding their capacity in 2037, even without the Pickerings Farm development. As such, the level of service on the network at these locations will be

unacceptable for a development of this size to be granted permission without transport intervention, and without the SRWD scheme the site may not be able to proceed.

Further investigation of this site, including dependency testing, will be undertaken during development of the Outline Business Case to determine the implications of this analysis for the site.

The assumed site area for the dependent development assessment is calculated using a density of 30 dwellings/hectare to give **a site area of 45 hectares**. Note that this is smaller than the circa 90 hectares stated in pre-2019 masterplan documents, at which point up to 2,000 dwellings were considered.

Cuerden Strategic Site

The Cuerden Strategic Site is a proposed major employment site located next to the M65 terminus roundabout, with the main access to the site being off this roundabout (part of the A582 SRWD improvement scheme).

With a site area of **65 hectares**, this is the largest site in the City Deal, and is key to both Central Lancashire Local Development Framework Core Strategy and the South Ribble Borough Council Site Allocations and Development Management Policies Development Plan (DPD).

The Cuerden Strategic Site has been granted planning permission but is currently unable to proceed due to the necessity of providing an upgrade to the M65 Terminus Roundabout to provide the primary access to the site. The necessary scale of the upgrade to ensure a safe and efficiently operating junction able to accommodate a high volume of goods traffic for the strategic employment site cannot be viably met from private sector contributions. A lack of public intervention will render the entire site unviable, significantly hampering growth ambitions in Central Lancashire and the Northern Powerhouse Economy.

The total site area for Cuerden Strategic Site is estimated at 65 hectares. The indicative proposals show that the non-residential scheme could include:

- Around 840,000 sq ft for general employment uses
- Around 600,000 sq ft for mixed commercial use such as food retail, hotel and car sales showroom
- Around 130,000 sq ft for business and industrial hybrid units[1]

After converting to square metres and splitting into distinct land uses for application of trip rates, the gross floor areas used to develop dependent development trip matrices are shown in Table K.1:

Table K.1: Dependent Development Gross Floor Areas

TRICS Land Use Type	Description	Gross Floor Area (sqm)
B1	Offices	6,040
B2	Light Industrial	45,060
B8	Warehousing / Logistics	94,760
A1	Retail (non-food)	24,150
Total		**170,012**

[1] http://www.thisiscuerden.co.uk/our-proposals/

K.3 Valuing Unlocked Development within the Business Case

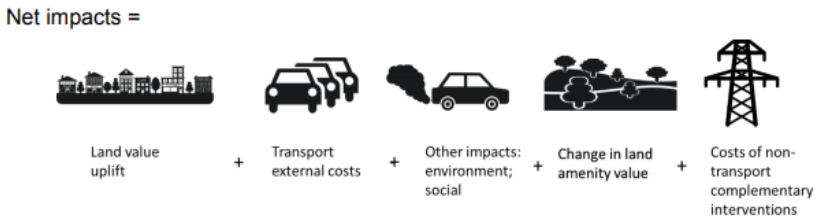
As discussed above, the fact that the A582 SRWD unlocks the new housing and employment developments is a key benefit of the scheme. It should therefore be considered within its business case.

Although the benefits of dependent housing unlocked by a transport scheme should not be included in the core economic assessment (i.e. it should not affect the BCR calculations), the benefits should still be captured and taken into consideration when deriving a Value for Money assessment of the scheme.

The benefits to society from the unlocked development will be captured through assessment of the land value uplift. Land value uplift measures the difference between the price of land in its new and former uses and represents the private gain to land owners. It provides a convenient way of estimating the economic value of a development which is dependent on a transport intervention.

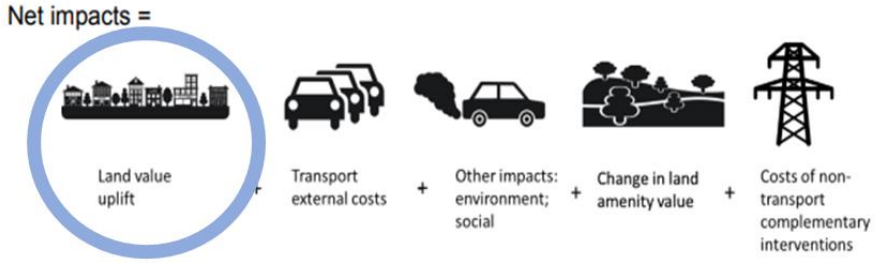
Land value uplift benefits for the unlocked developments will be calculated in line with TAG Unit A2.2 and the DfT's *'Capturing housing impacts in transport appraisal'* case study document (2018) and will consistent with the methodology set out in the Ministry of Housing, Communities and Local Government (MHCLG) appraisal guide.

The value of the unlocked development is calculated according to the following formula:



K.3.1 Land Value Uplift

LVU measures the difference between the price of land in its new and former uses and represent the private gain to land owners.



The methodology for assessing Land Value Uplift follows guidance in TAG Unit A2.2 and also guidance published by the Ministry of Housing, Communities and Local Government (MHCLG, formerly DCLG). The preferred method – the residual valuation methodology – requires a valuation surveyor to assess the residual land value. However, such an assessment has not been undertaken at the time of this assessment.

As such, TAG land value estimates for policy appraisal contained in the DfT's 'Valuing Dependent Development Workbook' (May 2019) were used. These land value estimates are intended for the purpose of policy appraisal and were provided to MHCLG by the Valuation Office Agency (VOA). Land values are estimated for residential land, agricultural land and industrial land.

The first step in calculation of the land value uplift was to identify existing land values for the proposed Pickerings Farm and Cuerden sites, and values for its future residential and commercial uses. These are summarised in Table K.2 below:

Table K.2: Land Value Estimates (2017 prices)

	Value (Per Hectare)	Source
Existing Land Use	£25,000	Agricultural Land: Lancashire
Residential Land Use	£1,715,000	Residential land: Preston
Commercial Land Use	£500,000	Industrial / Office Out of Town Land: Lancashire (Blackburn)

The prices in the table above were converted to 2010 market prices for use in appraisal. Land values were first inflated to nominal prices, using a land value appreciation of 7% pa as outlined in the MHCLG guidance. They were then deflated to 2010 using the WebTAG Databook GDP deflator, resulting in a real value of about 4.7% pa in the longer term. Sensitivity testing around the nominal land value appreciation rate has been undertaken.

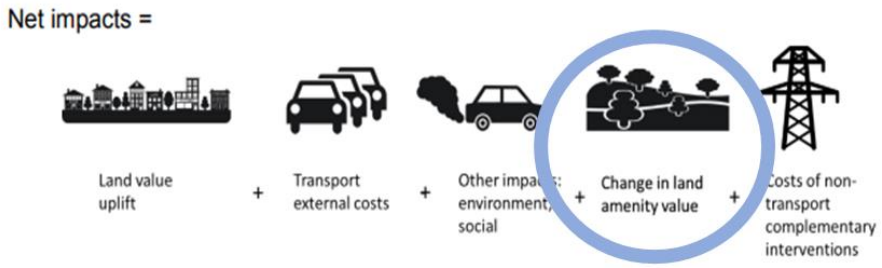
The resultant values of existing and future land uses were then used to calculate the change in land value for both the dependent development sites. Build-out rates were assumed to be at 10% per annum. Discounting to 2010 was applied based on each year of build-out. A summary of the change in land value is provided in Table K.3.

Table K.3: Land Value Uplift (2010 prices, discounted to 2010)

	Site Area (Hectares)	Land Value Uplift (2010 prices, discounted to 2010)
Residential Land	45	£60.6m
Commercial Land	65	£24.6m
Total	110	£85.2m

K.3.2 Land Amenity Values

The 'amenity value' of a plot of land refers to the level of pleasantness of the area. For example, where new developments are built on greenfield land, there may be a loss in the land amenity value if the area becomes less desirable for recreational activity.



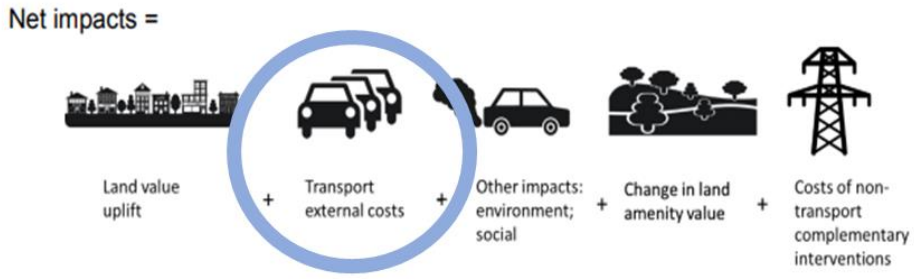
The land amenity values used were taken from the DfT's 'Valuing Dependent Development Workbook' (May 2019), which supplements TAG Unit A2.2. The 'infinite period' value for "Urban Fringe (greenbelt)" was used. A summary of the values used and final results is provided in Table K.4.

Table K.4: Amenity Land Value (2010 prices, discounted to 2010)

	Value
Amenity Value *(Present Value per hectare, 2010 prices, 'Infinite Period')*	£0.247m
Residential Area (Ha)	45
Commercial Area (Ha)	65
Loss of Land Amenity Value for Residential Area	£11.1m
Loss of Land Amenity Value for Commercial Area	£16.1m
Total loss of Land Amenity Value	£27.2m

K.3.3 Transport external costs

TECs refer to the costs imposed by new transport users from the dependent development site on all other existing users through increased levels of congestion.



TAG Unit A2.2 recommends that TECs are estimated by calculating the difference in user costs between a traffic model without the dependent trips included compared to one with dependent trips included. These costs are then multiplied by the total trips in the matrix without the dependent trips in order to determine the impact on those non-dependent users.

The A582 SRWD SATURN model developed for economic appraisal was taken as the reference case on which dependent development (DD) could be added. The network with DD includes signalization of the M65 terminus roundabout and the Cuerden Strategic site access roads on Stanifield Lane and Wigan Road. In addition, a new Pickerings Farm access road was added, connecting the A582 and Bee Lane (signalised at the A582 junction).

Dependent development trips were calculated using per dwelling trip rates for housing and TRICs trip rates for commercial gross floor area. For retail, the average Cuerden Transport Assessment[2] trip rate was used. The development trips were distributed based on distributions from similar nearby "parental zones", then added to the core forecast demand with an adjustment to background growth to ensure total trips were constrained to NTEM forecasts.

[2] Cuerden Strategic Site: Transport Assessment (January 2017), Mott Macdonald

TUBA was run with the without-DD scenario as the reference ('Do Minimum') case and with-DD time and distance skims, but without-DD demand matrices as the 'Do Something' case. The TUBA benefits per time period are shown in Table K.5. This ensured that only the disbenefits to the *existing* traffic is considered within the assessment.

Table K.5: TUBA Benefits by Period

Period	User Benefits (2010 prices, discounted to 2010)
AM Peak	-£4.4m
PM Peak	+£2.5m
Inter-peak	-£2.2m

A negative TUBA benefit is expected as the additional development traffic increases delay at junctions, and due to the introduction of traffic signals as part of the development infrastructure. The results in the AM peak and Interpeak periods reflect this. However, an overall *benefit* is recorded in the PM peak, which is unexpected. Further analysis shows that this is driven by the 2037 PM model, due to model noise located away from the development related network and flow changes.

The results from the PM peak were therefore discarded. As a proportionate measure at SOBC stage, the disbenefits in the PM peak were assumed instead to be equal to those from the AM peak. The total Transport External Costs are therefore equal to -£10.6m. This includes a monetised assessment of the impact on greenhouse gases.

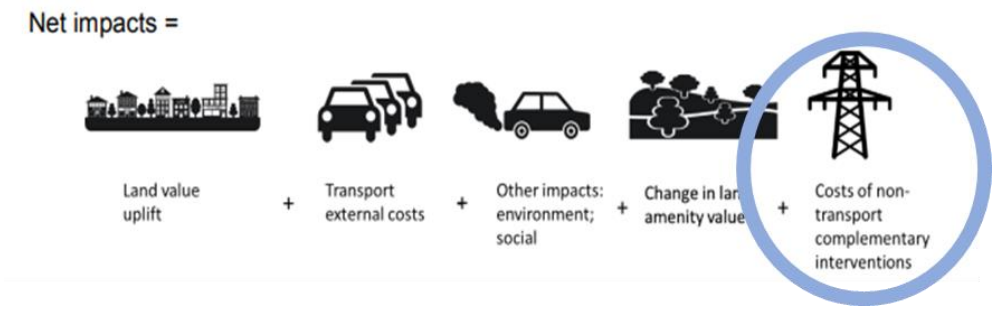
K.3.4 Environmental and social impacts

Social externalities that the proposed residential and commercial development would have on existing users (e.g. causing an increase in the number of accidents) are assumed to be small and have not been assessed.

In terms of Environmental externalities, the impact on Greenhouse Gases was included as part of the TUBA assessment of Transport External Costs. No other environmental impacts have been assessed.

K.3.5 Non-transport complementary interventions

A development may be also dependent on other non-transport complementary interventions (NTCIs), such as the provision of school facilities, health facilities or utilities. These other non-transport complementary interventions should be identified, such as through discussions with developers and local authorities and the costs of these should be appropriately represented in the appraisal.



At this stage, no additional cost allowance has been made for these interventions within the land value uplift calculation.

K.3.6 Additionality

The extent to which unlocking a development increases the size of the national economy (i.e. is 'additional') needs to be considered. This will depend on the extent to which leakage, deadweight, displacement and multiplier effects are expected to occur. These are defined as follows:

- **Leakage effects** – the extent to which economic growth takes place outside of target area of the Government intervention
- **Deadweight effects** – the extent to which the economic growth would have occurred anyway without the Government intervention.
- **Displacement effects** – the extent to which economic growth in one location results in lower growth elsewhere in the target area. A scheme may increase economic growth at the local but not national levels if growth is displaced from other areas.
- **Substitution** – the effect where a firm substitutes one activity for a similar one to take advantage of public sector assistance (can be thought of as 'within firm' displacement)
- **Multiplier effects** – the extent to which a rise in economic growth is 'multiplied' by increased business and consumer spending, known as 'indirect' and 'induced' multiplier effects respectively.

In order to assess a scheme's value for money it is necessary to assess its additionality at the national level. Without any adjustments, the benefits calculated using the method outlined above would assume 100% additionality. The adjustment values used to account for each of these effects are shown below.

Leakage: Leakage effects are not expected to be significant at the national level, as all impacts are expected within the United Kingdom.

Deadweight: Section 1.2 of this report outlined the reasons why Cuerden and the Pickerings Farm developments are considered to be dependent on A582. It also highlights that a significantly smaller development is unlikely to be progressed as an alternative. As it is assumed that the Cuerden and Pickerings Farm developments would not proceed without the A582 improvements in place, an assumption of zero deadweight is justified.

Displacement: As discussed in Section 1.2 of this report, the Pickerings farm site is one of the key and biggest areas of future housing across the districts as set out in the South Ribble Local Plan (2012-2026). If this site could not proceed, the equivalent housing growth could not simply move to another site, so there would likely be a genuine loss to the national housing stock in the short term. The residential land is therefore considered to require a low displacement adjustment factor. Based on Table 4.8 of *'HCA Additionality Guide Fourth Edition (2014)'*, a factor of 25% displacement has therefore been applied to residential land (i.e. 25% of potential benefits are lost due to displacement). For commercial land, a high displacement adjustment factor of 75% has been assumed.

Substitution: factors were used based on Table 4.9 of *'HCA Additionality Guide Fourth Edition (2014)'.*

Multiplier effects: No multiplier effect has been applied for both commercial and residential land as the Green Book recommends that multiplier effects are negligible at the national level.

A summary of the additionality adjustment factors, including the resultant overall adjustment factor, is provided in Table K.6.

Table K.6: Additionality Adjustment Factors

	Commercial Land	Residential Land
Deadweight (A)	0%	0%
Leakage factor (B)	0%	0%
Substitution factor (C)	2.2%	2.2%
Displacement factor (D)	75%	25%
Multiplier effect (E)	1.0	1.0
Total additionality adjustment: (1-A) x (1-B) x (1-C) x (1-D) x E	**0.24**	**0.73**

K.4 Calculation of net Land Value Uplift Benefits

A summary of the land value uplift benefits is provided in Table K.7. The gross land value uplift benefits are calculated, then adjusted by additionality factors to give net land value uplift benefits.

Table K.7: Land Uplift Value Benefits (2010 prices, discounted to 2010)

		Residential Land	Commercial Land	Total
Site Area (Ha)		45	65	110
Land Value Uplift	[1]	£60.6m	£24.6m	£85.2m
Land Amenity Value	[2]	£11.1m	£16.1m	£27.2m
Transport External Costs*	[3]	£4.3m	£6.3m	£10.6m
Cost of NTCI	[4]	£0m	£0m	£0m
Gross Land Value Uplift	[5] = [1]-[2]-[3]-[4]	£45.1m	£2.3m	£47.4m
Additionality Adjustment	[6]	0.73	0.24	-
Net Land Value Uplift	**[7] = [5] x [6]**	**£33.1m**	**£0.6m**	**£33.7m**

**Total TEC impacts split between Residential and Commercial developments based on size of site area*

K.5 Sensitivity Tests

Several sensitivity tests were undertaken to test the importance of different appraisal assumptions:

- **Test 1: Land Value Appreciation Value** – the land value appreciation value was reduced to 6%, instead of the recommended value of 7%. Benefits reduced from £33.7m to **£29.3m.**
- **Test 2: Additionality Factors** – the additional assumption for residential land was changed from 'Low' to 'Moderate'. Benefits reduced from £33.7m to **£22.6m**.
- **Test 3: Landscape Amenity Value** – the amenity value of the existing was based on 'agricultural: intensive' instead of 'greenbelt'). Benefits increased from £33.7m to **£44.3m**.