



# A582 Dualling

## Environmental Statement

Volume 2 Main Statement

Chapter 12: Transport and Transport

**Project Title:** A582 Dualling Environmental Statement

**Chapter Title:** Chapter 12 – Traffic and Transport

**Version No:** Final

	<b>Created By</b>	<b>Checked By</b>	<b>Date Comments provided</b>
<b>Version 1</b> <i>Insert date</i>	Andy Robbin / Eve Rogers	Huw Nicholas	Robert Taylor Victoria Walmsley Richard Askew 07/01/2019
<b>Version 2</b> <b>23/10/2019</b>	Andy Robbin / Eve Rogers	Huw Nicholas	Robert Taylor Akwas Koduah Niamh O'Sullivan 07/01/2020
<b>Version 3</b> <b>17/01/2020</b>	Eve Rogers	Gary Jones	
<b>Document Status</b>	Final		

## 12 Traffic and Transport

ES Chapter Number	Environmental Topic	Relevant Appendices
12	Traffic and Transport	Appendix 12.1 – Atkins Scoping Note Appendix 12.2 – Changes to CLTM Model Appendix 12.3 – 2022 Junction Turn Counts Appendix 12.4 – Journey Times Appendix 12.5 – Junction Modelling Results Appendix 12.6 – Flow Difference Plots from SATURN Appendix 1-3.3 – Section/ Legs Appendix 1-3.4 Junctions

### 12.1 Introduction

12.1.1 This chapter contains the outcome of the traffic impact assessment as result of implementing the scheme. Effects on non-motorised users is assessed in Chapter 13 ‘Effects on all Travellers’ in Volume 2 of this ES. This assessment has been produced as a Transport Assessment (TA) which has been prepared in support of the planning application for the dualling of the A582 and the B5253 (the scheme). The TA has been prepared in accordance with the guidance set out in Department for Transport (DfT) “*Guidance on Transport Assessments*” (2007) and in consultation with Lancashire County Council's Highway Development Service (LCC-HDS).

12.1.2 The scheme would comprise the dualling of the current single carriageway northern section of the A582 starting from Golden Way at the Broad Oak Roundabout travelling south to the A582/Flensburg Way Roundabout, where the scheme then continues in both a southerly and easterly direction. The southern leg of the scheme stops at the Longmeanygate junction and to the east with the A5083 Stanifield Lane junction. The scheme would also include improvements to the following junctions:

- Longmeanygate / Flensburg Way;
- Croston Road / Farington Road; and,
- Sherdley Road / Farington Road.

12.1.3 The aims of the scheme are to:

- Improve journey time and consistency by reducing congestion on (and on roads linking to) the A582, B5253 and Penwortham New Bridge linking to Ringway and Preston City Centre;
- Provide easier access to Cuerden from the west;
- Provide significantly better access to new housing developments at Pickering's Farm between Penwortham and Lostock Hall, and development sites to the North West of Leyland at Croston Road and Moss Side;
- Provide improved cycle and pedestrian facilities along the length of the scheme with the 3m wide combined cycletrack and crossing points incorporated into the signal-controlled junctions; and,
- Allow opportunities for bus priority measures, public realm enhancements, and improvements to prioritise and promote walking and cycling along on the B5254 Leyland Road and at Tardy Gate.

12.1.4 In total, it is anticipated that the road widening would extend to approximately 6.8km in length.



## 12.2 Relevant Legislative, Plans, Policies and Background

### National Policy

#### National Planning Policy Framework

12.2.1 The National Planning Policy Framework February 2019 (the NPPF) sets out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which locally prepared development plans can be produced. Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise and the NPPF is a material consideration in planning decisions.

12.2.2 Section 9 of the NPPF relates to transport matters and states that transport issues should be considered from the earliest stages of development proposals. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. (NPPF Paragraph 103). This can help to reduce congestion and emissions and improve air quality and public health. However, it is also noted that opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be considered in decision-making.

12.2.3 When considering development proposals Paragraph 108 of NPPF states that consideration should be given to whether:

a) *“Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*

b) *Safe and suitable access to the site can be achieved for all users; and*

- c) *Any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.*

12.2.4 Paragraph 109 of NPPF goes on to say:

*“Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impact on the road network would be severe.”*

12.2.5 Therefore, in this context Paragraph 110 of NPPF states that applications for development should:

- a) *“Give priority first to pedestrians and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
- b) *Address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- c) *Create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- d) *Allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- e) *Be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations”.*

12.2.6 A582 dualling will provide a high capacity route for traffic from the south and east to Preston City Centre and areas to the west of the city centre. This would create an attractive alternative for this traffic from the B5254 Leyland

Road through Lostock Hall and Lower Penwortham. Providing the opportunity to introduce public transport improvements along the B5254 Leyland Road corridor to the benefit of the communities along the corridor.

12.2.7 The increased capacity along the A582 corridor will also provide access to new housing developments between Tardy Gate and the A582 corridor as well as those planned and under development to the north-west of Leyland

12.2.8 The route will provide improved walking and cycling facilities along its length promoting sustainable forms of transport.

### **Local Land Use Planning Policy**

#### Central Lancashire Core Strategy (2012)

12.2.9 The Central Lancashire Core Strategy sets out the joint Central Lancashire authorities' spatial planning proposals to 2026 for the combined area, which includes the South Ribble Borough where the scheme is situated.

12.2.10 The purpose of the Core Strategy is to set the overall strategic direction for planning in the area over the period from 2010 to 2026, in line with national policies. A key part of that direction is establishing where major development and other forms of investment should be located to be sustainable, meet local needs and take full advantage of opportunities. The policies contained in the Core Strategy will be taken together in determining planning applications and priorities for Central Lancashire.

12.2.11 Policy 1 sets out the basis for locating growth within the strategy area and identifies three proposed strategic locations where growth and investment will be concentrated – one of which is in South Ribble. The south of Penwortham and north of Farington Strategic Location comprises the greenfield land, south of Kingsfold to the household waste recycling centre at Farington and is bounded to the west by the A582 and to east by the West

Coast Main Line railway (WCML) and beyond which is Tardy Gate District Centre.

12.2.12 The location is of strategic importance by virtue of its ability to significantly contribute to infrastructure and housing requirements in the South Ribble Borough. Policy 1 notes that existing transport infrastructure can be capitalised upon, but that more significant investment will be required to help to deliver.

12.2.13 Development within the South Ribble strategic development area will bring increased pressure to improve the A582 and provide increased capacity on the links between the A59 and the M65 and M6 motorways, thus justifying the inclusion of this scheme in Policy 3 which confirms the overarching core strategy commitment to the development.

#### South Ribble Borough Council – Local Plan (2015)

12.2.14 The Local Plan (2012 – 2026) forms part of the statutory Development Plan for South Ribble. It identifies and allocates land required over a 15 year period in order to achieve the vision for growth as outlined in the Central Lancashire Core Strategy. The Central Lancashire Core Strategy Policy 1 concentrates development in the Preston and South Ribble urban area and includes a Strategic Location – South of Penwortham and North of Farington.

12.2.15 SRBC assessed the concept of the Strategic Location from the Core Strategy, measured against housing and employment land requirements and the need to protect existing Green Infrastructure. This Strategic Location is identified for a residential development it is known as Pickering's Farm it will be approximately 79 ha with up to 1,350 houses. The remaining area within the South of Penwortham and North of Farington Strategic Location will be safeguarded for development needs after the Plan period.

12.2.16 Pickering's Farm development is a large site that would be delivered by a number of developers. Policy C1 sets out the basis upon which development would be permitted. Central to Policy C1 is the production of an agreed masterplan which covers the comprehensive development of the site, setting out how land uses will be distributed, how the infrastructure (including Green Infrastructure) and community facilities will be delivered and the programme for the implementation of the masterplan.

12.2.17 There are currently a number of issues in the area related to traffic congestion, accessibility, public realm and local facilities. 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. In addition, to address these issues is the section of the Cross Borough Link Road (development link road) as required in Policy A1, which will link the A582 Penwortham Way with the B5254 Leyland Road. The development link road could include a new bridge crossing the West Coast Main Line or improvements to the existing bridge.

12.2.18 To help provide the necessary infrastructure to support development SRBC along with Preston and Chorley Councils have established a Community Infrastructure Levy (CIL) that applies charges on development. The CIL contributions would, be used to provide further transport infrastructure, covering all modes of transport, as set out in the Central Lancashire Highways and Transport Masterplan (CLHTM). This includes proposals to upgrade links and junctions on the A582 which runs adjacent to the site, or for widening parts of this route to a dual carriageway.

### **Local Transport Planning Policy**

#### Lancashire County Council Local Transport Plan (2011 – 2021)

12.2.19 The Local Transport Plan (2011-2021) sets out the County Council's vision for transport across the whole of Lancashire and includes the following Transport Goals:

- To help to secure a strong economic future by making transport and travel into and between our major economic centres more effective and efficient and by improving links to neighbouring major economic areas and beyond.
- To provide all sections of the community with safe and convenient access to the services, jobs, health, leisure and educational opportunities that they need.
- To improve the accessibility, availability and affordability of transport as a contribution to the development of strong and cohesive communities.
- To create more attractive neighbourhoods by reducing the impact of transport on our quality of life and by improving our public realm.
- To reduce the carbon impact of Lancashire's transport requirements, whilst delivering sustainable value for money transport options to those who need them.
- To make walking and cycling more safe, convenient and attractive, particularly in the more disadvantaged areas of Lancashire, bringing improvements in the health of Lancashire's residents.
- In all that we do, to provide value for money by prioritising the maintenance and improvement of Lancashire's existing transport infrastructure where it can help to deliver our transport goals.

### Central Lancashire Highways and Transport Masterplan

12.2.20 The Central Lancashire Highways and Transport Masterplan (CLHTM) March 2013, has been prepared by Lancashire County Council to support the economic and social growth of the central Lancashire area this include Preston City Council, South Ribble Borough Council and Chorley Council. The CLHTM sets out the new highway capacity that is required to ease current and predicted future highway congestion assist in delivery of 22,200 new homes and 23,000 new jobs by 2026 and the A582 Dualling, also

known as the South Ribble Western Distributor, is one of the key projects that has been identified by Lancashire County Council.

**Figure 12.1 Extract of CLHTM illustrating the A582 Dualling (South Ribble Western Distributor)**



**A582 South Ribble Western Distributor**

Capacity improvements along the existing A582 between Cuerden/Moss Side and Preston city centre to support delivery of the South of Penwortham/North of Farington strategic housing location and major housing sites at Croston Road and Moss Side.

Upgrading the A582 to a dual carriageway along its full length between Cuerden and Preston city centre and the B5253 south to Longmearygate will significantly increase road capacity. Improvements will include alterations to, and closures at, existing junctions along the route. It will also support the completion of the Penwortham Bypass and, looking further ahead, the linking of the two Western Distributor Roads in Preston and South Ribble with the construction of a new crossing of the River Ribble.

Increasing road capacity will:

- Improve journey times and reduce congestion on (and on roads linking to) the A582, B5253 and Penwortham New Bridge linking to Ringway and Preston city centre.
- Provide easier access to Cuerden from the west.
- Provide significantly better access to new housing developments at Pickerings Farm between Penwortham and Lostock Hall, and development sites to the North West of Leyland at Croston Road and Moss Side.
- Allow opportunities for bus priority measures, public realm enhancements, and improvements to prioritise and promote walking and cycling along on the B5254 Leyland Road and at Tardy Gate.

The indicative access arrangements onto the A582 from the planned housing developments at Pickerings Farm and Croston Road are shown on Figures 14 and 15.

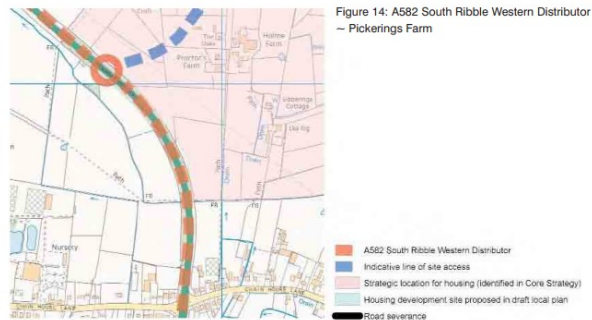


Figure 14: A582 South Ribble Western Distributor – Pickerings Farm



Figure 15: A582 South Ribble Western Distributor – Croston Road

The Lancashire Strategic Transport Prospectus

12.2.21 Central Lancashire, with Lancashire’s principal city Preston at its heart, is a transport hub of national significance, providing most of the county’s connections to the West Coast Main Line, the M6 and, in the future, to HS2. The Preston, South Ribble and Lancashire City Deal builds on the strong economic performance of the area over the last ten years and will see Central Lancashire transformed, creating 20,000 net new private sector jobs and delivering over 17,000 new homes, underpinned by significant investment in new and improved transport infrastructure. Whilst Lancashire’s growth sectors will account for many of these jobs, in particular, at the Enterprise Zone sites at Samlesbury and Warton, Preston’s business and financial sector will also expand, with the University of Central Lancashire



reconfiguring to place itself at the heart of the city. It will be vital to existing and new business, whether based in Central Lancashire or further afield, that accessing Lancashire is straightforward and not compromised by problems on the rail and strategic road networks elsewhere across the North.

12.2.22 The Preston, South Ribble and Lancashire City Deal has set out ambitious plans for new commercial and residential development. One of the legacies of City Deal investment is long term land supply to support the economic ambition set out in the Strategic Economic Plan. Many of the key long term opportunities are close to the M6 and there is a risk that constraints at key junctions or capacity will constrain new development.

## 12.3 Existing Site Conditions

### Highway Configuration

12.3.1 The scheme is located to the south of Preston, between Penwortham and Cuerden. It includes a section of the A582 extending from Lower Penwortham at the eastern side of the Broad Oak Roundabout before continuing south along Penwortham Way for approximately 3km. The route continues south of the A582 down B5253 Flensburg Way to Longmeanygate Roundabout near the Moss Side Industrial Estate. It then follows an eastern direction along Flensburg Way and Farington Road until it meets Stanifield Lane Roundabout. In total, it is anticipated that the scheme would extend to approximately 6.8km in length.

12.3.2 The scheme area is currently a single carriageway, with several junctions along its length, the key junctions being:

- Broad Oak priority roundabout;
- Pope Lane signalised junction;
- Chain House Lane signalised junction;



- A582/Flensburg Way signalised roundabout (Tank Roundabout);
- Longmeanygate priority roundabout;
- A582/ Household Waste Recycling Centre (HWRC) priority junction;
- Croston Road West priority roundabout;
- Croston Road East priority roundabout;
- A582/Sherdley Road priority junction; and
- Stanifield Lane signalised roundabout.

12.3.3 The existing speed limit is 60mph across the length of the study area, with exception to the section of the A582 between Broad Oak Roundabout and 250m south of Chain House Lane junction, which is a 50mph speed limit. Also, the section of the A582 over the Croston Road east and west roundabouts, which has a 30mph speed limit.

### **Public Transport**

There are no bus services operating and stopping along the A582 between Broad Oak Roundabout and the A6/M65 roundabout or along the B5253 between the A582/Flensburg Way Roundabout and the Longmeanygate Roundabout. However, there are several services that operate in the surrounding areas, with bus stops within 200m and 400m of the scheme. The routes of these services are illustrated in Figure 12.2 and the location of bus stops, with walk distances, are shown in Figure 12.3.

12.3.5 The frequency of each service is set out in Table 12.1.

**Table 12.1 Frequency of Existing Bus Services**

Service	Route	Frequency (Minutes)		
		Weekdays	Saturday	Sunday
3	Preston loop (via Penwortham)	12*, 10**	10 mins	15 mins
12	Longton <-> Preston	30	30	No Service
109	Preston <-> Chorley	30	30	60
111	Moss Side <-> Preston	12	12	30
112	Preston <-> Leyland	60	60	No Service
113	Preston <-> Wigan	60	60	No Service
125 (outside survey area)	Preston <-> Bolton	10	12	30
89 (outside survey area)	Preston loop (via Larches and Park and Ride)	10	10	20

Figure 12.2 Bus Routes Within the A582 Scheme Study Area

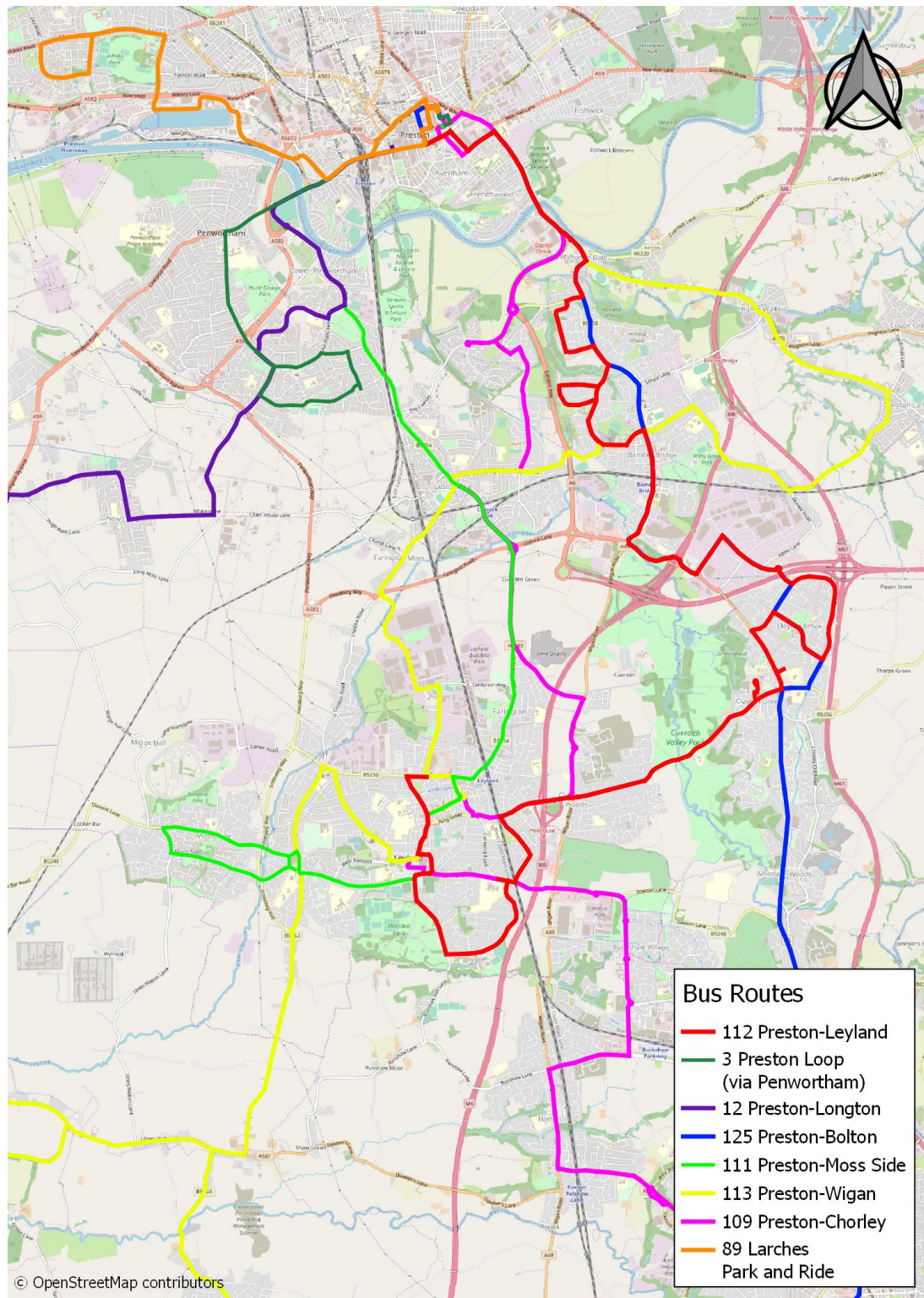
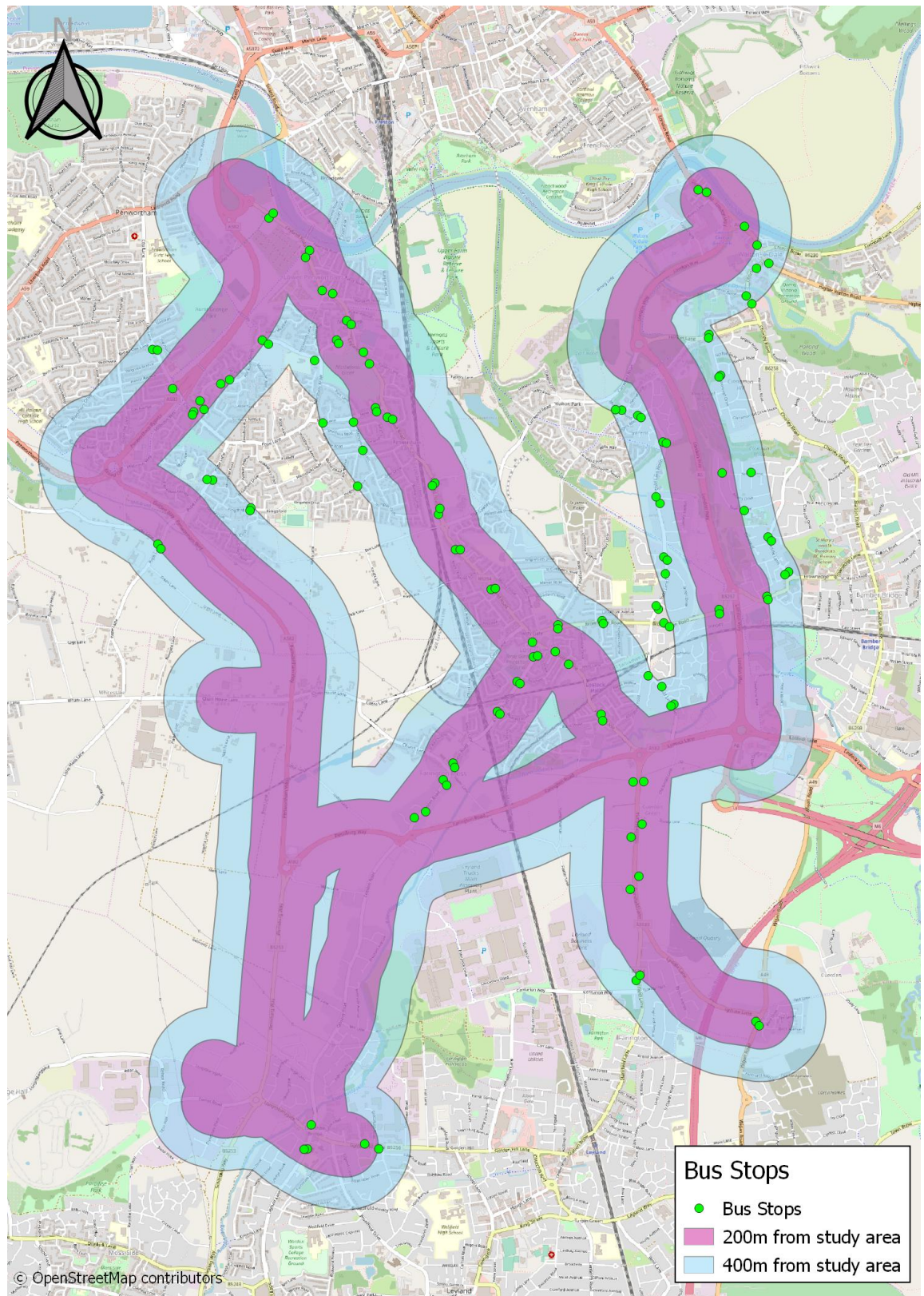




Figure 12.3 Bus Stops and Walk Distance with A582 Scheme Study Area



12.3.6 There are no bus services that run along or stop on the route of the proposed A582 scheme. There are services that do pass through a junction, or multiple junctions, included within the scheme. The implementation of the scheme, and any changes to these junctions, could have a material impact in the operation of the services at this point.

### Collision Data

12.3.7 Collision data shows that there have been 116 collisions in the past 5-year period from 2014 to 2018, inclusive. These have been broken down by severity in Table 12.2 and show that there were no fatalities within the scheme area, that 81% of collisions resulted in slight injury and the remaining 19% of collisions resulted in serious injury.

**Table 12.2 Collision Data for 2014 to 2018 by Severity**

Year	Collision Severity		
	Slight	Serious	Fatal
2014	11	7	0
2015	30	4	0
2016	18	4	0
2017	19	2	0
2018	16	5	0
Total	94	22	0

12.3.8 Over the 5 year period 73% of the collisions that occurred were at, or on the approach to a junction; however, there were 9 collisions (8%) on the section between the Chain House Lane junction and the Longmeanygate junction. There were collisions on other links, but these links appear to have a more significant concentration than others.

12.3.9 Figure 12.4 illustrates the distribution of the collisions, by severity, across the scheme.



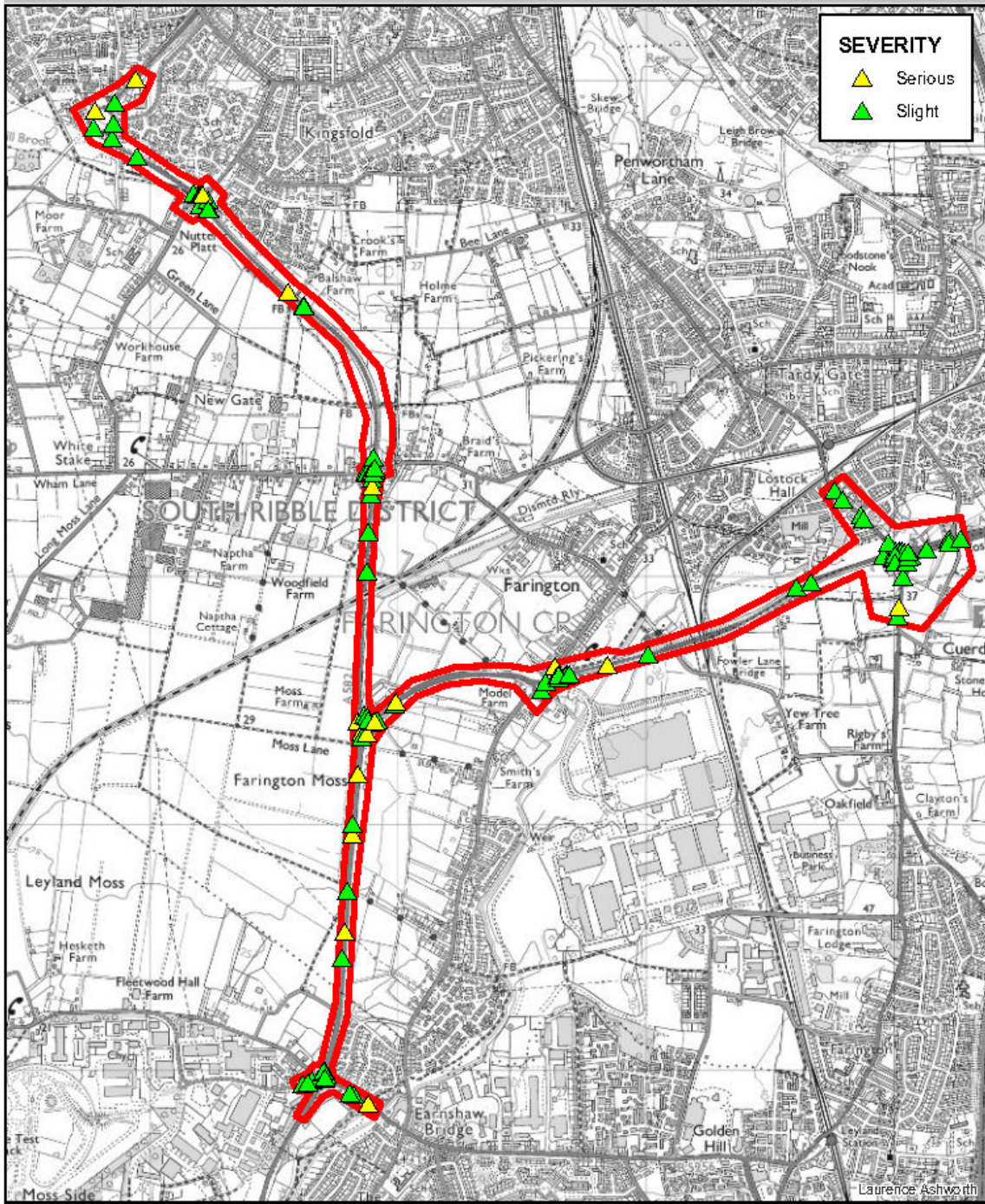
Figure 12.4 Location of Collisions by Severity: 2013 to 2017

A582 Scheme Boundary



Map created : 20/03/2019

Map scale : 1:20,098



## 12.4 Scheme

### Overview

12.4.1 A brief overview of the scheme is included within Section 12.1 with a more detailed description of the scheme provided in Chapter 3, Section 3.2 of this ES. Appendices 1-3.3 and 1-3.4 in Volume 3 of this ES illustrate the Sections/Legs drawings and Junctions drawings respectively.

### Detailed Scheme Description

12.4.2 The following provides a detailed description of the proposed widening scheme for each key section and the changes to junctions and accesses.

#### Broad Oak Roundabout to Pope Lane (Golden Way)

12.4.3 The A582 (Golden Way) is to be converted to a dual carriageway between the recently upgraded Broad Oak Roundabout (November 2018) and the junction with Pope Lane, upgraded (November 2017) to a signal controlled crossroad. There are no local accesses or side roads along this section of the A582 that would be directly impacted.

#### Pope Lane to Chain House Lane (Penwortham Way)

12.4.4 The A582 Penwortham Way would be upgraded to a dual carriageway between the junction with Pope Lane and the junction with Chain House Lane (November 2014), a signal controlled crossroad. There are no local accesses or side roads along this section of the A582 that would be directly impacted, although there are some field access points on either side which will be retained.

12.4.5 The scheme would provide a signal-controlled junction at a point where the A582 turns to the south as part of the Pickering's Farm residential development, but this link road does not form part of the scheme.

#### Chain House Lane to A582/Flensburg Way Roundabout

12.4.6 The A582 Penwortham Way would be upgraded to a dual carriageway between the junction with Chain House Lane and the junction with A582/Flensburg Way Roundabout (Tank Roundabout). There is a side road, Brook Lane (west side), along this section of the A582 that would be directly impacted by the scheme by being converted to left-in left-out priority junction. The scheme also includes the replacement of the Woodfield railway bridge to accommodate the dualling.

#### A582/Flensburg Way Roundabout to Longmeanygate Roundabout

12.4.7 The B5253 (Flensburg Way) would be upgraded to a dual carriageway between the junction with A582/Flensburg Way Roundabout and the junction with Longmeanygate (B5256). The scheme includes replacing the existing roundabout with a five arm signalised junction, with controlled pedestrian and cycle crossing facilities across all arms of the junction.

12.4.8 There are two side roads, Hugh Lane (west side) and Bannister Lane (east side) along this section of the A582 that would be directly impacted by the scheme by being converted to left-in left-out priority junctions.

#### A582/Flensburg Way Roundabout to Croston Road/Centurion Way

12.4.9 The A582 (Flensburg Way) would be converted to a dual carriageway between A582/Flensburg Roundabout and the double compact roundabouts at the junction with Croston Road and Centurion Way. The double compact round junction will be converted into a linked signalised staggered junction. The first junction will cater for Croston Road south and will accommodate movements to and from Fidler Lane, the second junction will cater for Croston Road north and the third junction will cater for Centurion Way.

12.4.10 There is one side road, Lodge Lane (north side) along this section of the A582 that would be directly impacted by the scheme by being converted to left-in left-out priority junction.



12.4.11 The main entrance to the Household Waste Recycling Centre (HWRC) located on the north east corner of A582/Flensburg Roundabout will also be converted to a left-in left-out priority junction. This would mean all vehicles approaching from the east would need to U-turn at A582/Flensburg Roundabout. Exiting to the east is facilitated by the existing egress on Penwortham Way.

#### Croston Road to Stanifield Lane Roundabout

12.4.12 The A582 Farington Road would be converted to a dual carriageway between the junction with Croston Road/Centurion Way and the junction with Stanifield Lane Roundabout. Over this section new structures will be provided over Fowler Lane and the WCML railway to accommodate eastbound carriageway, with the existing bridges over Fowler Lane and WCML railway accommodating the westbound carriageway.

12.4.13 There are two side roads, Fowler Avenue (south side) and Sherdley Road along this section of the A582 that would be directly impacted by the scheme. Fowler Avenue would be converted to left-in left-out priority junction, whilst Sherdley Road will be converted from a priority junction with right turn holding lane and a ghost island to a signal-controlled junction.

## **12.5 Transport Assessment Methodology**

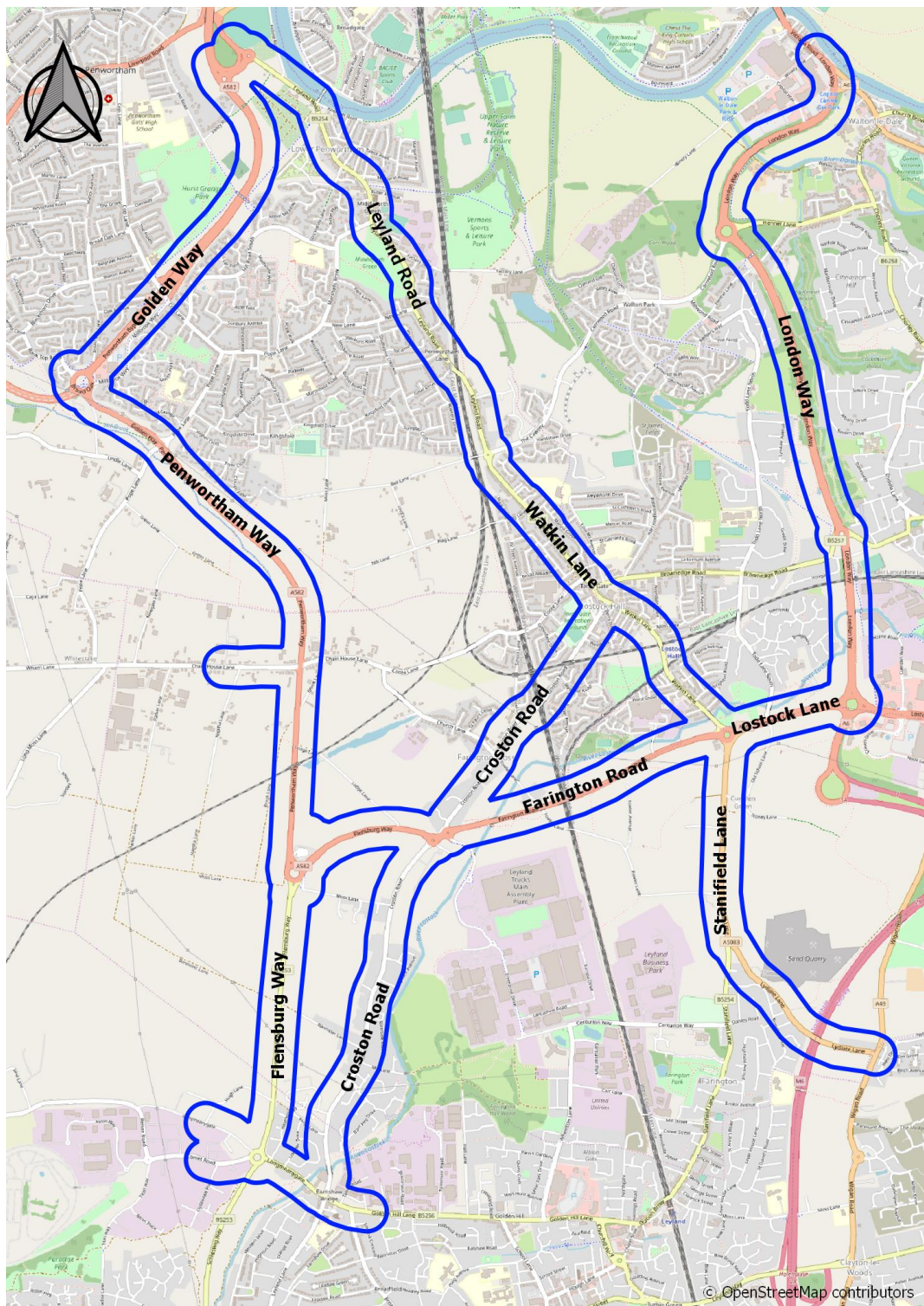
### **Scoping**

12.5.1 A scoping exercise has been undertaken with Lancashire County Council's Highway Development Service (LCC-HDS) prior to the production of this Transport Assessment. A Scoping Note was produced and submitted to and reviewed and subsequently agreed by LCC-HDS. The Scoping Note (5161943-ATK-TA-001 Rev1), is contained in Appendix 12.1 in Volume 3 of this ES.

## Study Area

12.5.2 The study area covers the scheme and along with the key corridors that link into the scheme, as shown in Figure 12.5.

Figure 12.5 A582 TA Study Area



## Traffic Modelling

### Model Choice and Assessment Years

12.5.3 In agreement with LCC-HDS the latest version of the Central Lancashire Traffic Model (CLTM) – Do Something Models have been used as the starting point for deriving the traffic flows for this Transport Assessment.

### Scenarios

12.5.4 Strategic and operational traffic modelling has been undertaken for the following scenarios:

1. Do Minimum (DM) Opening Year (2022);
2. Do Something 1 (DS1) Opening Year (2022) – As described in 12.4 with Pickering's Farm Link Road;
3. DM Design Year (2037);
4. DS1 Design Year (2037) As described in 12.4 with Pickering's Farm Link Road; and,
5. DS2 Design Year (2037) As described in 12.4 without Pickering's Farm Link Road (i.e. no through connection to Bee Lane).

12.5.5 Scenario 2 and Scenario 4 correspond with the CLTM 'Do Something' models for 2022 and 2037 that have been prepared by Jacobs for LCC.

## Assessment of Impacts on the Network

12.5.6 The CLTM has been used to provide link flows for each of the model scenarios set out in section 12.5.4. The flows will be compared between the DM and DS scenarios to provide an overview of the average journey times, two way daily flows, annual average daily traffic and percentage of HGV's.

### Average Journey Times

12.5.7 Changes in average journey times have been compared on a link by link basis for the AM, PM and Inter Peak (IP) periods.

### Two-way Daily Flows

12.5.8 Changes in two-way daily flows have been compared on a link by link basis for the vehicle types listed below for the AM, PM and IP periods.

- Cars
- LGVs
- HGVs

### Annual Average Daily Traffic (AADT)

12.5.9 AADT (24 hours) flows and speeds have been compared on a link by link basis for the vehicle types listed below:

- Cars
- LGVs
- HGVs

### Percentage HGV

12.5.10 Changes in the percentage of HGVs have been compared on a link by link basis for the AM, PM and IP periods.

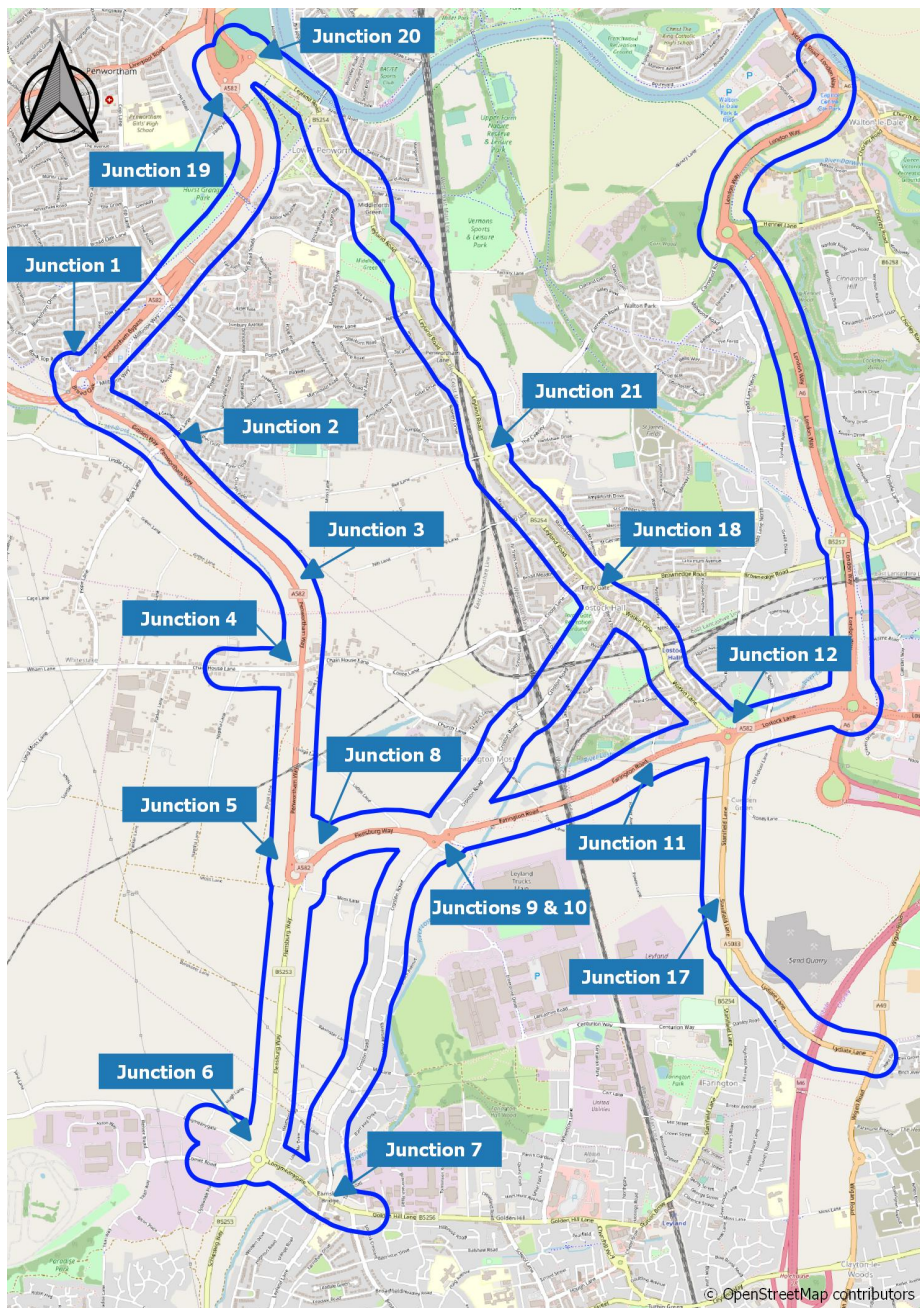
### **Junction Capacity Assessments**

12.5.11 Junction capacity assessment has been undertaken using Junctions 9 and LinSig where appropriate, for the junctions shown in Figure 12.6.



12.5.12 Junction modelling was undertaken for a typical weekday AM and PM peak period for the model scenarios set out in 12.5.4 above. Traffic turning flows and queue lengths have been initially taken from the CLTM for each scenario. Figure 12.6 shows the location of the junctions modelled, while Table 12.3 provides the junction number, name and the control type in each modelling scenario.

**Figure 12.6 Junction Locations**



**Table 12.3 Junction Number / Naming and Control Type by Model Scenario**

Junction Reference	Junction Name	Scenario				
		DM 2022	DS1 2022	DM 2037	DS1 2037	DS2 2037
		Junction Type				
J01	Broad Oak	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout
J02	Pope Lane	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad
J03	Pickering's Farm Link Road	No Junction	No Junction	Signalised T-Junction	Signalised T-Junction	Signalised T-Junction
J04	Chain House Lane	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad
J05	Penwortham Way / Flensburg Way	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout
J06	Flensburg Way / Longmeanygate	Roundabout	Signalised 5 Arm Junction	Roundabout	Signalised 5 Arm Junction	Signalised 5 Arm Junction
J07	Longmeanygate / Golden Hill	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad	Signalised Crossroad
J08	A582 / HWRC	Priority Junction	Left-In / Left-Out	Priority Junction	Left-In / Left-Out	Left-In / Left-Out
J09	Croston Rd West	Roundabout	Signalised T-Junction (linked with J10)	Roundabout	Signalised T-Junction (linked with J10)	Signalised T-Junction (linked with J10)
J10	Croston Rd East	Roundabout		Roundabout		
J11	A582 / Sherdley Rd	Priority Junction	Signalised	Priority Junction	Signalised	Signalised

Junction Reference	Junction Name	Scenario				
		DM 2022	DS1 2022	DM 2037	DS1 2037	DS2 2037
		Junction Type				
J12	Stanifield Lane	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout
J17	Fowler Lane	Priority Junction	Priority Junction	Priority Junction	Priority Junction	Priority Junction
J18	Watkin Lane Stagger	Signalised Staggered - Link	Signalised Staggered - Link	Signalised Staggered - Link	Signalised Staggered - Link	Signalised Staggered - Link
J19	Oaks Wood Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout	Signalised Roundabout
J20	Leyland Road / A59	Signalised Junction	Signalised Junction	Signalised Junction	Signalised Junction	Signalised Junction
J21	Leyland Rd / Bee Ln / The Cawsey	Roundabout (existing)	Signalised Junction	Roundabout (existing)	Signalised Junction	Roundabout (existing)

## Collision Data Analysis

12.5.13 An assessment of future possible collision rates has been undertaken adopting DfT COBA methodology. The assessment is based on a comparison of collisions by severity and associated costs across an identified network in the DM and DS scenarios, using:

- details of link and junction characteristics;
- relevant collision rates and costs; and,
- forecast traffic volumes by link and junction.

12.5.14 The existing collision data has been used as a baseline and analysed to form the basis of the input file for the software. The Opening Year and the Design Year traffic flows would also be part of the input to the software.

12.5.15 Given the size of the study network and the number of collisions recorded this approach provides an efficient, accurate and recognised method for understanding how the schemes will impact on collisions rates.

## 12.6 Strategic Traffic Modelling

### Overview

12.6.1 The CLTM 2022 and 2037 'Do Something' models which have been created by Jacobs for LCC have been used as the foundation for the production of the Transport Assessment.

### Model Network Changes

12.6.2 In order to accurately reflect the scheme and the junctions / network that form the study area, some modifications were undertaken to the CLTM model network for each scenario. These changes are described briefly in the sections below and a more detailed explanation in Appendix 12.2 in Volume 3 of this ES.



### Scenario 1 – DM 2022 (Opening Year)

- Junction 6 (Flensburg Way / Longmeanygate): convert the junction layout from a signal-controlled roundabout to the existing roundabout layout.
- Junctions 09 and 10 (Croston Road east and west): convert the linked signal-controlled junction back to the two existing compact roundabouts.
- Junction 11 (A582 / Sherdley Road): convert from a signal-controlled junction with separate right turn and left turn lanes to the existing priority junction layout.
- Junction 20 (Leyland Road / A59): modification of junction layout from roundabout to signal controlled junction, including removal of free-flow lane from A582 southbound to A59 northbound.
- Junction 21 (Bee Lane): convert the signal controlled cross-road to the existing compact roundabout.
- A582 Dualling: revert to single lane single carriageway those sections of the A582 proposed to be dualled as part of the scheme.

### Scenario 2 – DS1 2022 (Opening Year)

- Junction 6 (Flensburg Way / Longmeanygate): convert the junction layout from a signal-controlled roundabout to a 5-arm signalised junction layout.
- Junction 11 (A582 / Sherdley Road): change node to signal controlled junction with separate right turn and left turn lanes.
- Junction 20 (Leyland Road / A59): modification of junction layout from roundabout to signal controlled junction, including removal of free-flow lane from A582 southbound to A59 northbound.

- Junction 21 (Bee Lane): convert from compact roundabout to signal controlled cross-road.

#### Scenario 3 – DM 2037 (Design Year)

- Junction 6 (Flensburg Way / Longmeanygate): convert the junction layout from a signal-controlled roundabout to the existing roundabout layout.
- Junctions 09 and 10 (Croston Road east and west): convert the linked signal-controlled junction back to the two existing compact roundabouts.
- Junction 11 (A582 / Sherdley Road): convert from a signal-controlled junction with separate right turn and left turn lanes to the existing priority junction layout.
- Junction 20 (Leyland Road / A59): modification of junction layout from roundabout to signal controlled junction, including removal of free-flow lane from A582 southbound to A59 northbound.
- Junction 21 (Bee Lane): convert the signal-controlled crossroad to the existing compact roundabout.
- A582 Dualling: revert to single lane single carriageway those sections of the A582 that are proposed to be dualled as part of this scheme.

#### Scenario 4 – DS1 2037 (Design Year)

- Junction 3 (Pickering's Farm): modifications to the junction to reflect that proposed within the LinSig model provided.
- Junction 6 (Flensburg Way / Longmeanygate): convert the junction layout from a signal-controlled roundabout to a 5-arm signalised junction layout.
- Junction 11 (A582 / Sherdley Road): change node to signal controlled junction with separate right turn and left turn lanes.

- Junction 20 (Leyland Road / A59): modification of junction layout from roundabout to signal controlled junction, including removal of free-flow lane from A582 southbound to A59 northbound.
- Junction 21 (Bee Lane): convert from compact roundabout to signal controlled cross-road.

#### Scenario 5 – DS2 2037 (Design Year)

- Junction 6 (Flensburg Way / Longmeanygate): convert the junction layout from a signal-controlled roundabout to a 5-arm signalised junction layout.
- Junction 20 (Leyland Road / A59): modification of junction layout from roundabout to signal controlled junction, including removal of free-flow lane from A582 southbound to A59 northbound.
- Junction 21 (Bee Lane): convert the signal-controlled cross-road to a three-arm compact roundabout.
- Pickering's Farm Link Road: Removal of connection to Bee Lane (J21) and changes to loading points of zones to place all development traffic onto the A582 (J3).

## **12.7 Impact Assessment**

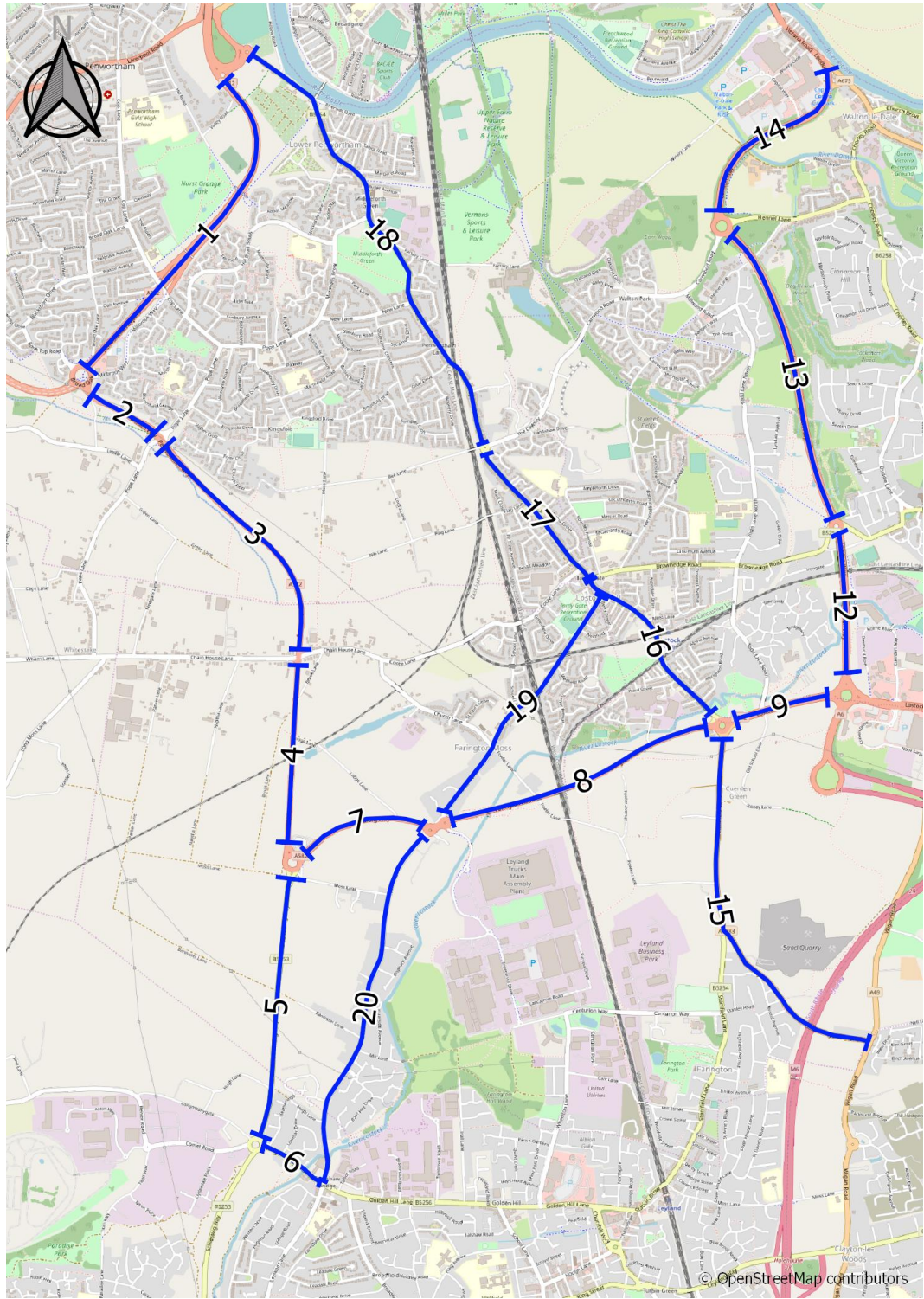
### **Study Area Road Network**

12.7.1 The updated CLTM has been used to identify the change in traffic flows on a link by link basis within the Study Area. The links considered in the assessment are shown in Figure 12.7 and listed in Table 12.4.

**Table 12.4 Link Number and Coverage**

<b>Link Number</b>	<b>Link Coverage</b>	<b>Link Number</b>	<b>Link Coverage</b>
1	Golden Way: Oaks Wood roundabout to Broad Oak roundabout.	12	London Way: London Way / M65 roundabout to Browndedge Road
2	Golden Way: Broad Oak Roundabout to Pope Lane	13	London Way: Browndedge Road to Carrwood Road
3	Penwortham Way: Pope Lane to Chain House Lane	14	London Way: Carrwood Road to Victoria Road
4	Penwortham Way: Chain House Lane to A582/Flensburg (Tank) Roundabout	15	Stanifield Lane: Stanifield Lane Roundabout to Wigan Road (A49)
5	Flensburg Way: A582/Flensburg Way: Roundabout to Longmeanygate Roundabout	16	Watkin Lane: Stanifield Lane roundabout to Watkin Lane staggered signals (Browndedge Road)
6	Longmeanygate: Longmeanygate Roundabout to Golden Hill	17	Watkin Lane: Watkin Lane staggered signals (Browndedge Road) to Bee Lane
7	Flensburg Way: A582/Flensburg Roundabout to Croston Road roundabouts	18	Leyland Road: Bee Lane to A59 roundabout
8	Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	19	Croston Road: Croston Road roundabout to Watkin Lane
9	Lostock Lane: Stanifield Lane Roundabout to London Way / M65 roundabout	20	Leyland Lane: Golden Hill to Croston roundabout.

Figure 12.7 A582 Study Area: Link Analysis Key Plan



12.7.2 This comparative analysis has been undertaken for the different data sets below:

- Average Journey Times (*All Vehicles*)
- Directional Peak Period and Inter-Peak Flows (*Cars / LGV / HGV*)
- Annual Average Daily Traffic (*Cars / LGV / HGV*)

12.7.3 Data has been extracted and compared for the AM, PM and Inter-Peak periods for the following scenarios:

- DM Opening Year (2022)
- DS1 Opening Year (2022)
- DM Design Year (2037)
- DS1 Design Year (2037)
- DS2 Design Year (2037)

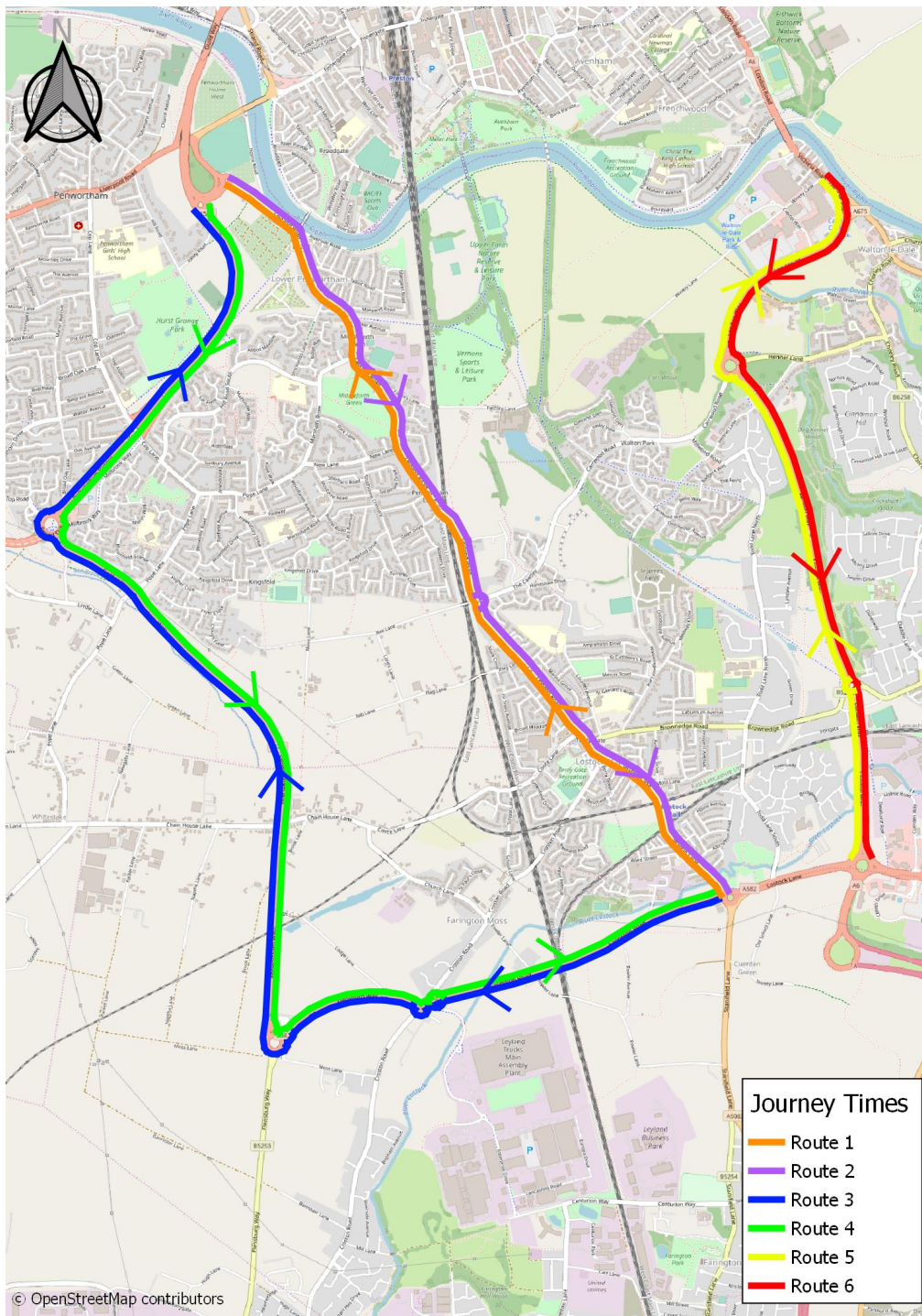
#### Average Journey Times

12.7.4 The following figures (Figures 12.9 – 12.16) shown the cumulative journey times for the six routes illustrated in Figure 12.8.

12.7.5 The full journey time outputs for all links within the study area are shown in Appendix 12.4 in Volume 3 of this ES.

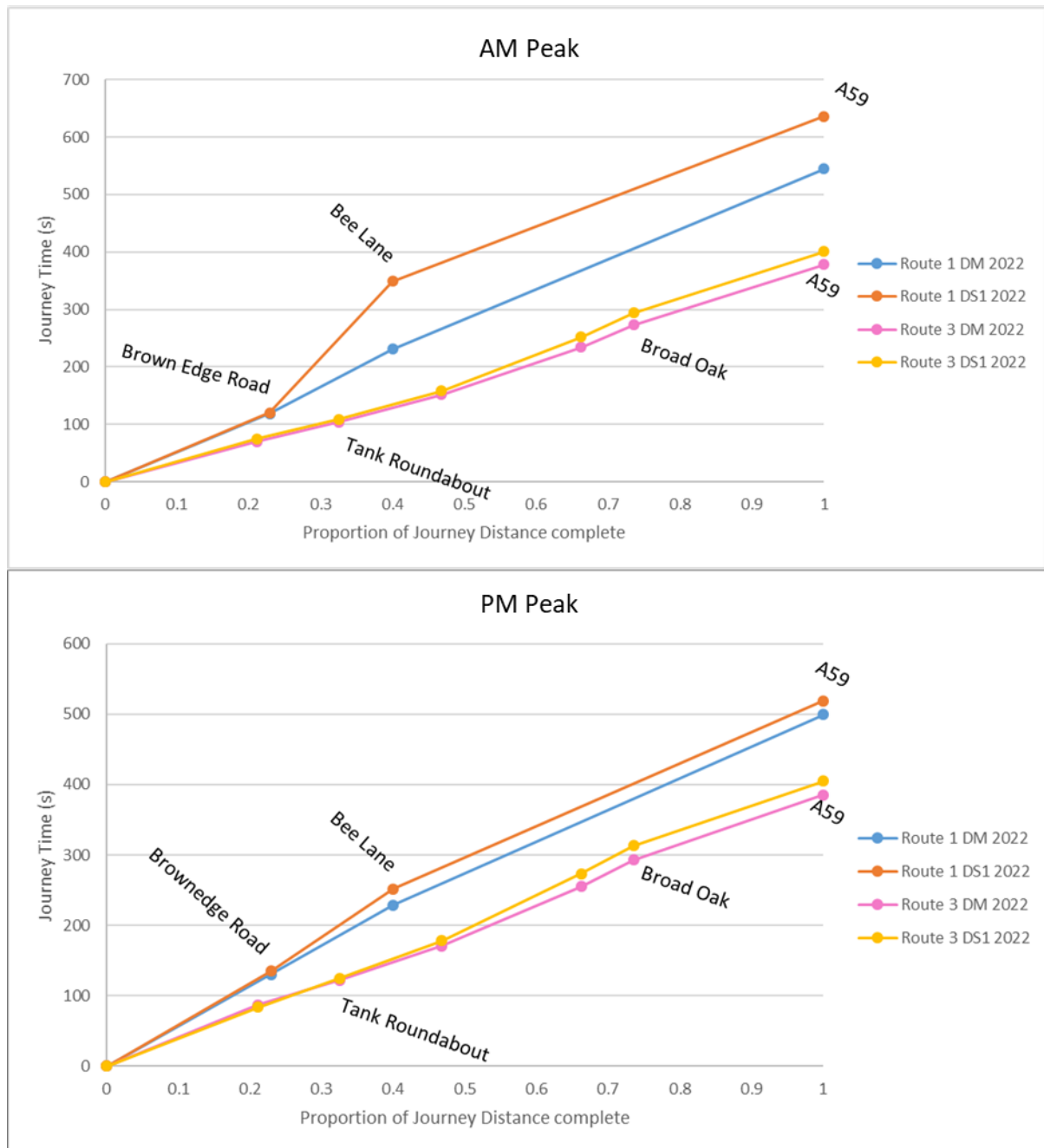


Figure 12.8 Journey time routes



12.7.6 The following figures show the average journey times for vehicles travelling northbound from the Stanfield Roundabout to the A59 roundabouts via Watkin Lane (Route 1) and the A582 (Route 3).

**Figure 12.9 AM - Peak and PM Peak cumulative journey time plots Scenario 1 (DM 2022) and Scenario 2 (DS1 2022) for Routes 1 and 3 (South to North)**

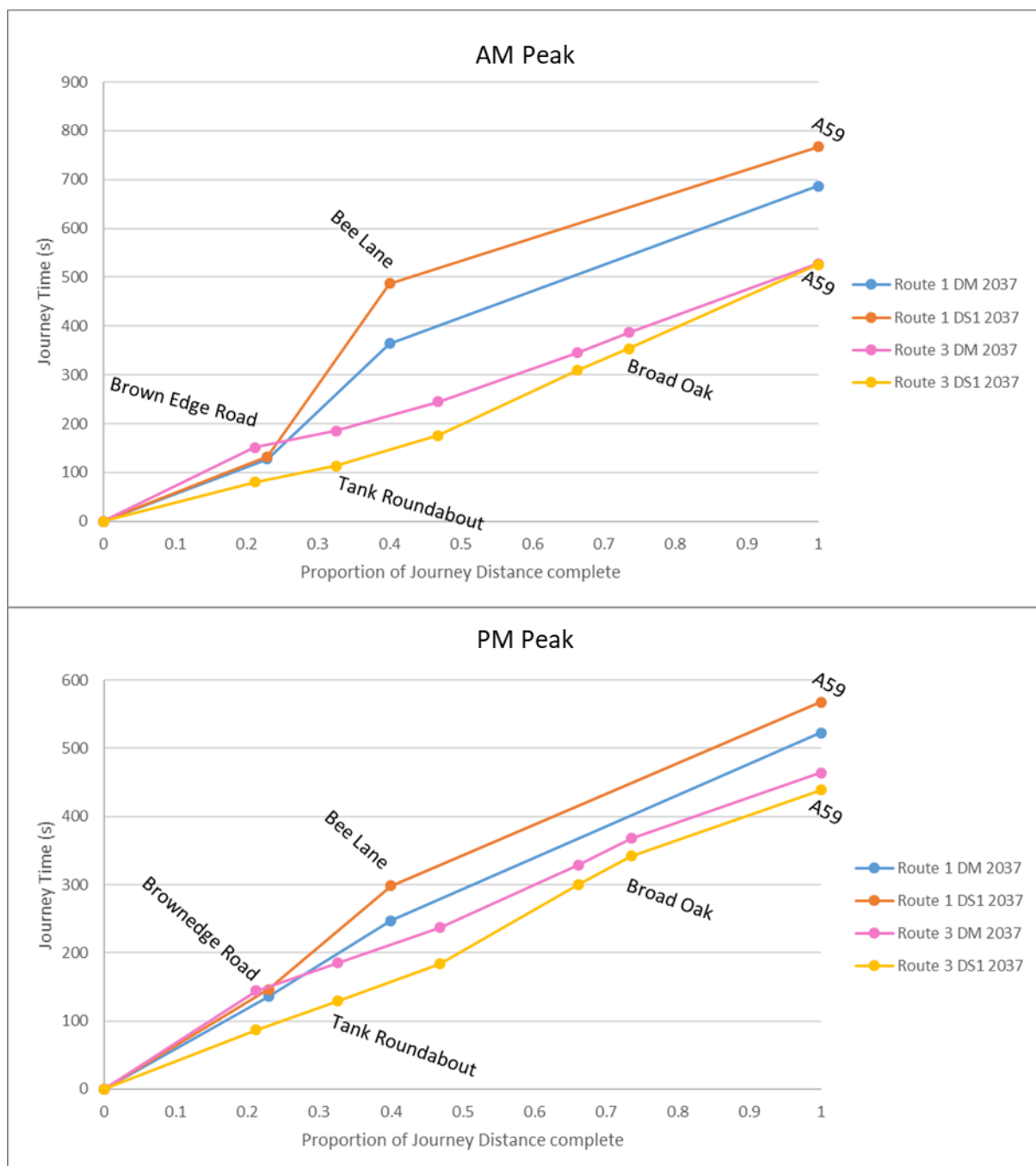


12.7.7 Figure 12.9 shows that the total journey time is lower along the A582 than along the B5242 Watkin Lane/Leyland Road in both the morning and evening peak periods. The journey times are longer along both routes with the scheme in place, with a significant increase approaching Bee Lane along the B5242 Watkin Lane/Leyland Road route with the scheme in place in the morning period. This may be caused by its conversion from a roundabout to



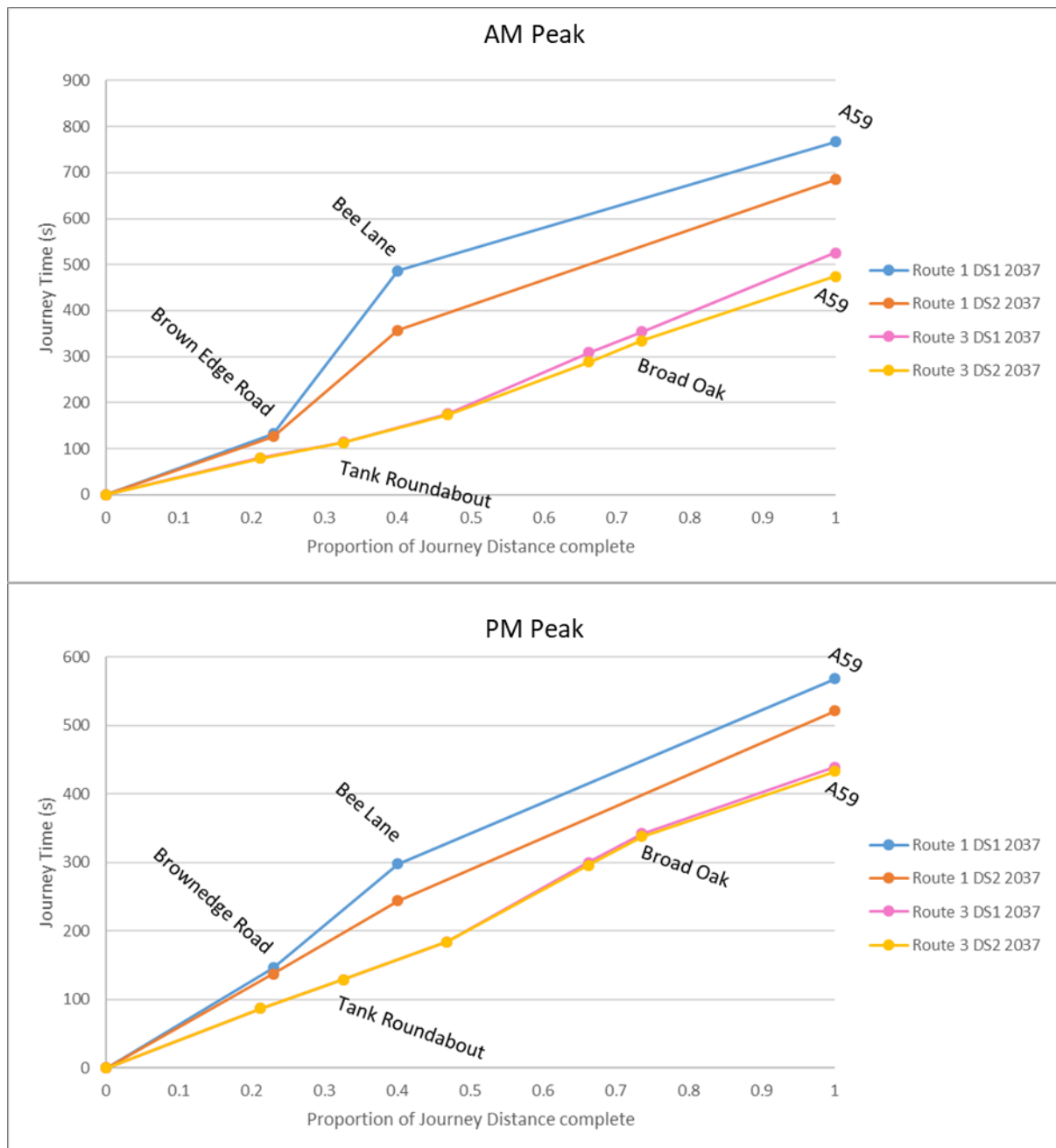
a signalised junction with the scheme in place. Along the A582 route there is little difference in journey time, in fact the journey time is marginally slower with the scheme in place. The additional delay occurs at the Pope Lane junction, where in DS1 traffic flows are marginally different to DM in the CLTM strategic model. Up to that point the journey times on the A582 are very similar.

**Figure 12.10 AM Peak and PM Peak cumulative journey time plots Scenario 3 (DM 2037) and Scenario 4 (DS1 2037) for Routes 1 and 3 (South to North)**



- 12.7.8 Figure 12.10 shows a lower journey time along the A582 than along the B5242 Watkin Lane/Leyland Road in both the morning and evening peak periods.
- 12.7.9 The journey times are longer along B5242 Watkin Lane/Leyland Road with the scheme in place in both the morning and evening peak periods, likely caused by the addition of signals at the Bee Lane junction. On the A582 the journey times are shorter with the scheme in place there is a reduction in journey times approaching the Croston Road junction on the A582 with the scheme in place. This may be caused by increased capacity due to the junction alterations. The journey times benefits gained however are reduced over the remainder of the route as the cumulative journey is the same, DM and DS1 in the morning peak and in the evening peak the DS1 journey time is only marginally quicker than the DM.

**Figure 12.11 AM Peak and PM Peak cumulative journey time plots Scenario 4 (DS1 2037) and Scenario 5 (DS2 2037) for Routes 1 and 3, (South to North)**

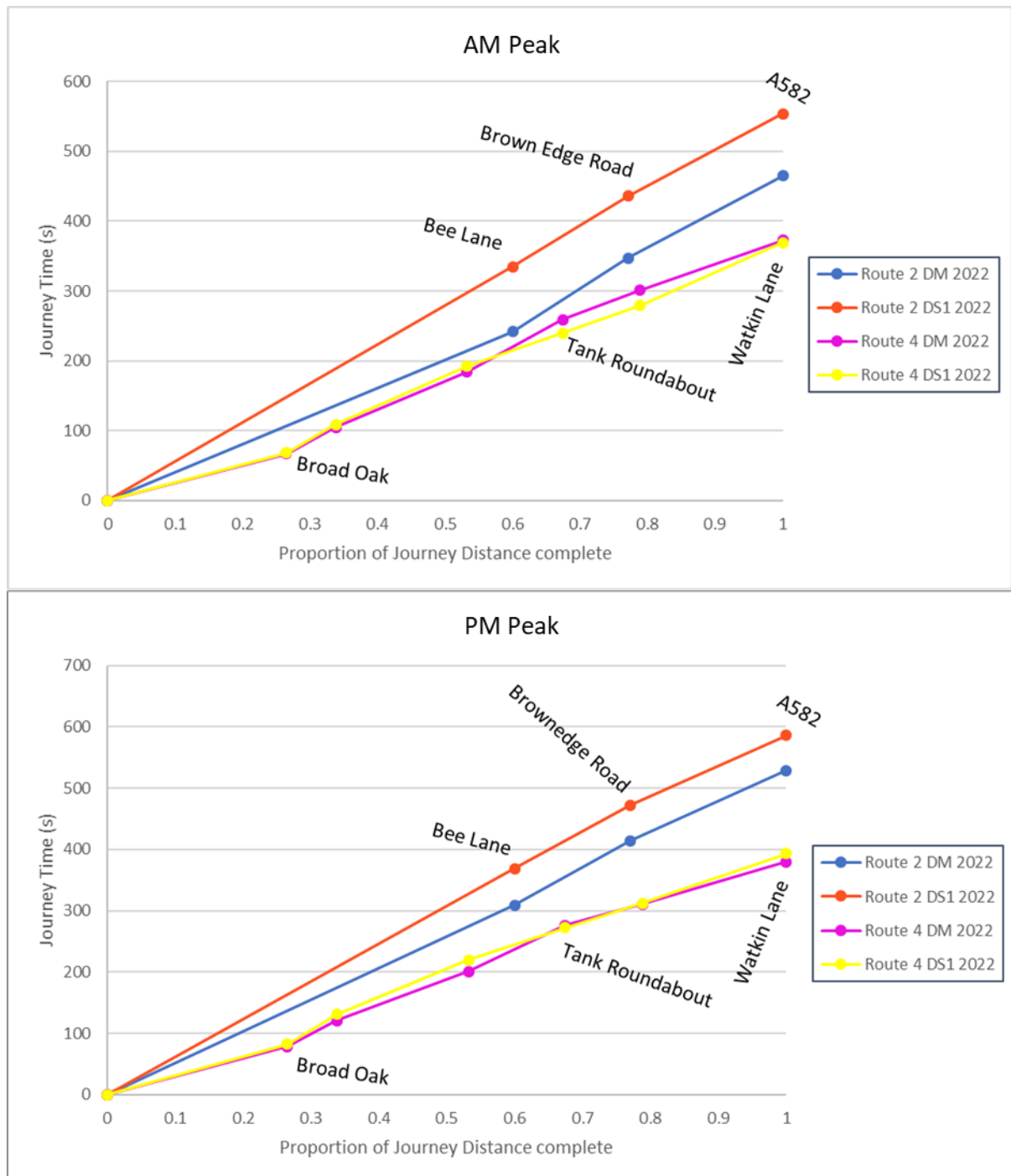


12.7.10 Figure 12.11 shows there is little difference in journey time along the A582 between DS1 and DS2 in the morning peak period and no difference in the evening peak period. Journey times along the A582 are less than along B5242 Watkin Lane/Leyland Road. Journey times on B5242 Watkin Lane/Leyland Road are quicker without Pickering's Farm Link Road (DS2) the difference occurs on the approach to Bee Lane. This is likely to be

caused by a reduction in demand at this junction from Bee Lane without the Pickering's Farm Link Road (DS2).

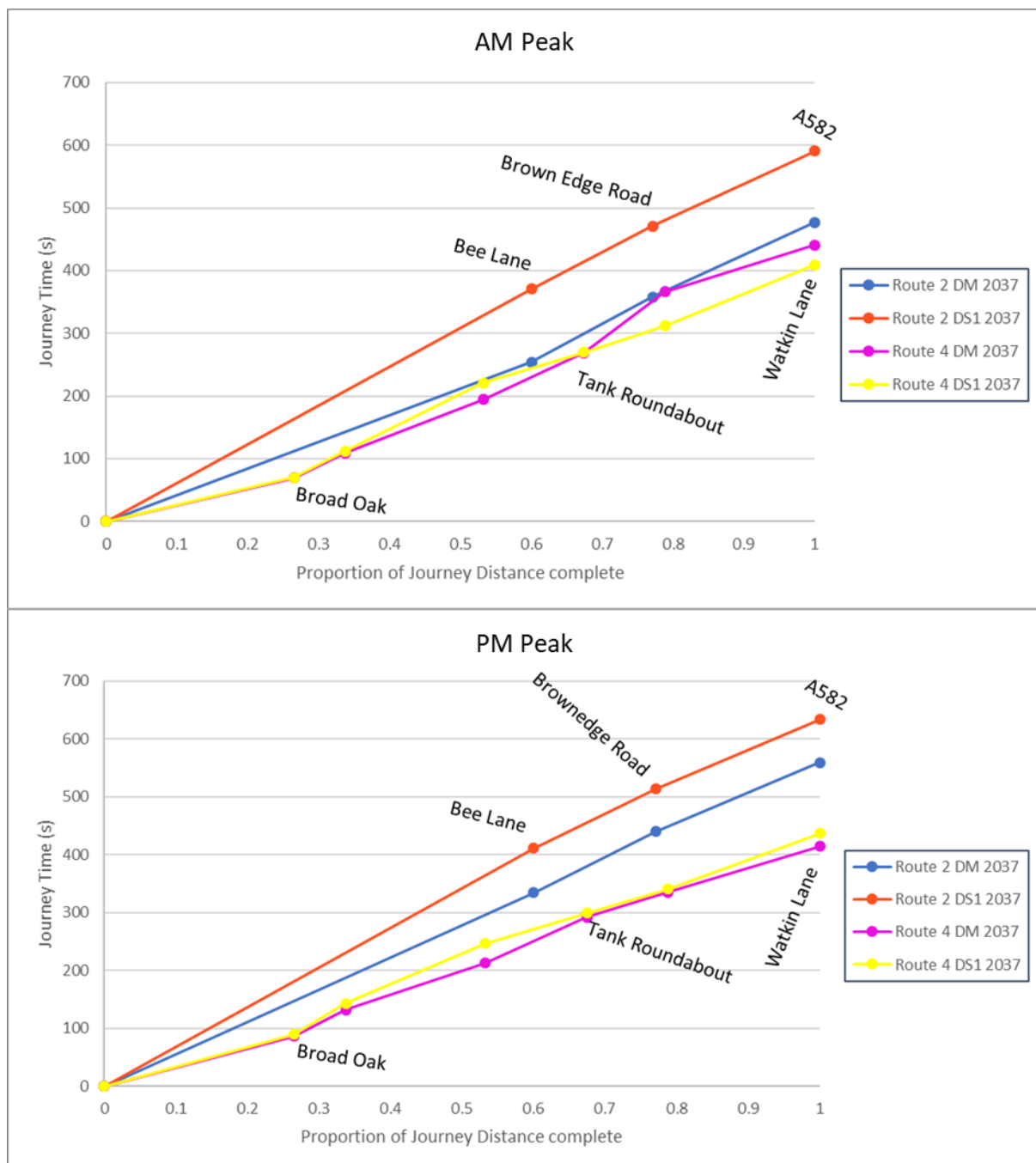
12.7.11 The following figures show the average journey times for vehicles travelling southbound along Watkin Lane (Route 2) and the A582 (Route 4) from the A59 roundabouts to the A582/Watkin Lane roundabout.

**Figure 12.12 AM Peak and PM Peak cumulative journey time plots Scenario 1 (DM 2022) and Scenario 2 (DS1 2022) for Routes 2 and 4 (North to South)**



12.7.12 Similarly, to the northbound routes, the journey time is less along the A582 than along B5242 Watkin Lane/Leyland Road for both scenarios. There is no significant difference in journey times along the A582 with the scheme in place, over the do minimum. Along the B5242 Watkin Lane/Leyland Road journey times increase on the approach to Bee Lane with the scheme in place. This is likely caused by the conversion of the roundabout to a signalised junction.

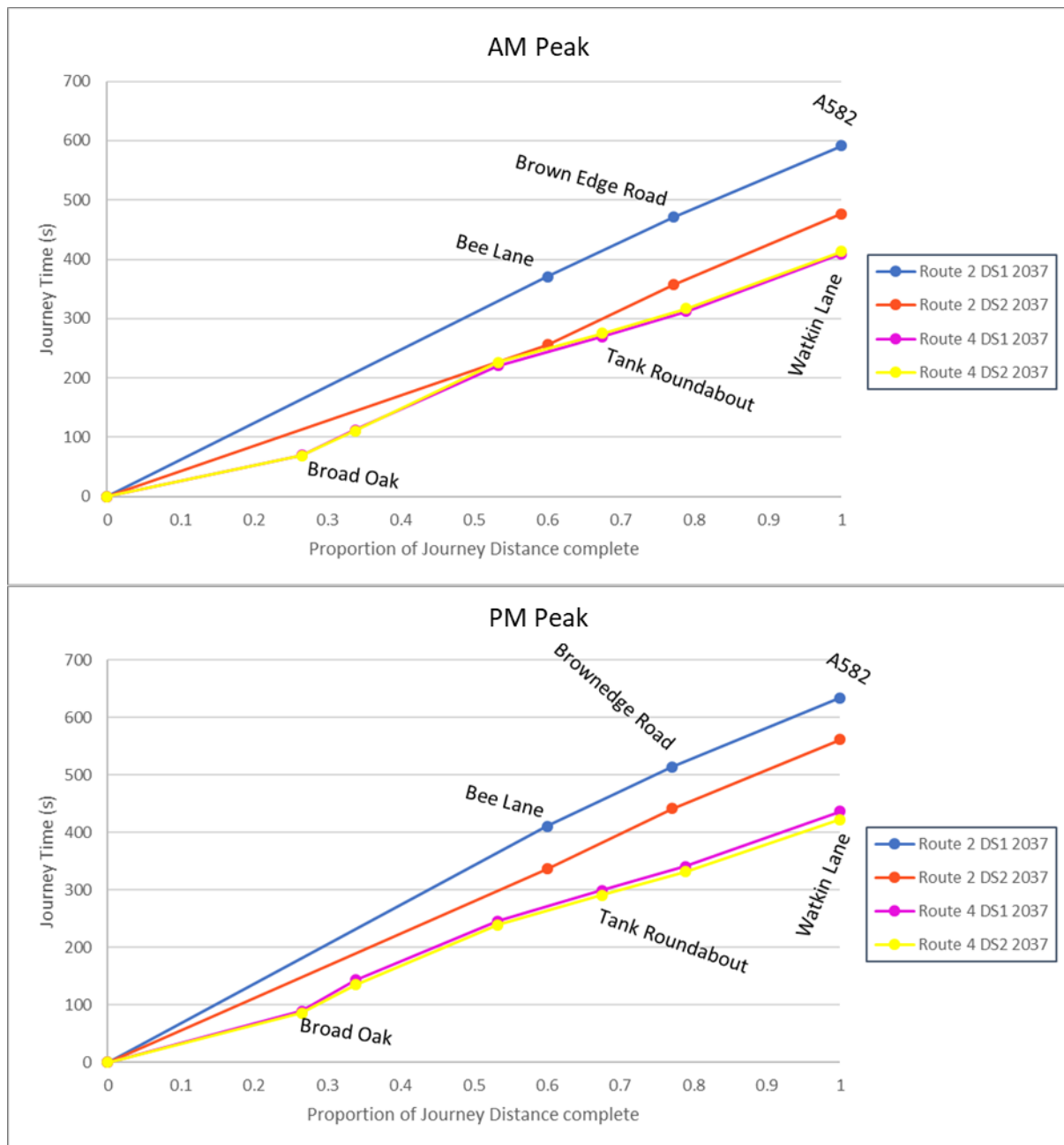
**Figure 12.13 AM Peak and PM Peak cumulative journey time plots Scenario 3 (DM 2037) and Scenario 4 (DS1 2037) for Routes 2 and 4 (North to South)**



12.7.13 The journey times along B5242 Watkin Lane/Leyland Road southbound (Route 2) in both peak periods are similar to the 2022 forecast year. Which suggest that in the model there is adequate capacity in these corridors in the southbound direction to accommodate the growth between 2022 and 2037 without any deterioration in level of service.

12.7.14 Along the A582 on the evening peak period journey times in 2022 and 2037 are very similar, again indicating that in the model there is adequate capacity in the southbound direction to accommodate the growth between 2022 and 2037 without any deterioration in level of service. In the morning peak period along the A582 there is an increase in delay at the Croston Road junction in the do minimum situation. This junction is converted from two roundabouts to a staggered signalised junction with the scheme, which appears to reduce delays at this junction.

**Figure 12.14 AM Peak and PM Peak cumulative journey time plots Scenario 4 (DS1 2037) and Scenario 5 (DS2 2037) for Routes 2 and 4 (North to South)**

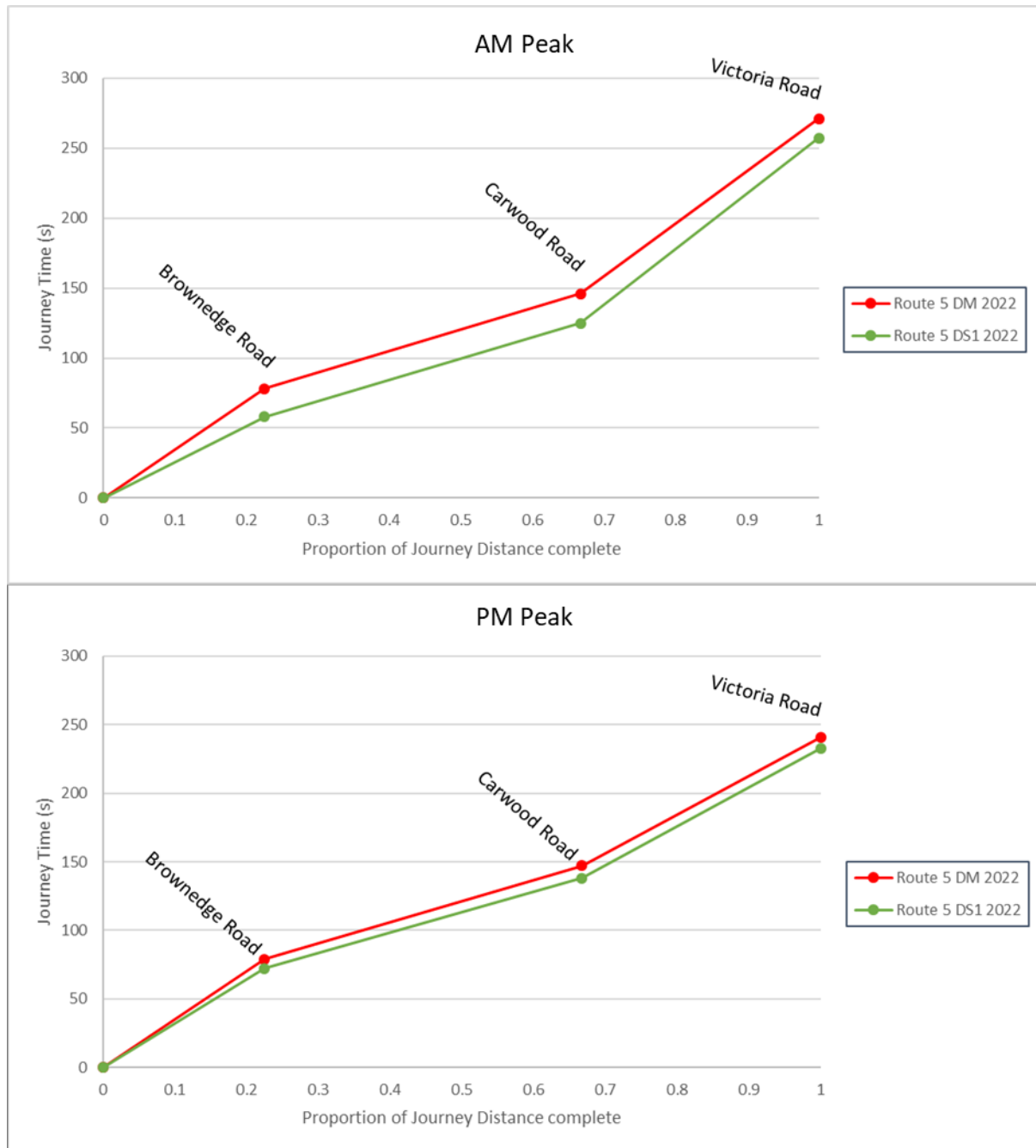


12.7.15 Figure 12.14 shows that there is no material difference in journey times along the A582 (southbound) between DS1 and DS2 and that the journey times along the A582 are still significantly less than along B5242 Watkin Lane/Leyland Road. Without Pickering’s Farm Link Road (DS2) there is reduced journey times on approach to Bee Lane along the B5242 Watkin Lane/Leyland Road ), as is the case in the northbound direction. This may

be caused by a reduction in demand at this junction from Bee Lane as traffic can't use this link as a through route.

12.7.16 The average journey times for vehicles travelling northbound along the A6 between the A582 and Victoria Road (Route 5) are shown in Figure 12.15 for scenarios 1 and 2.

**Figure 12.15 AM Peak and PM Peak cumulative journey time plots Scenario 1 (DM 2022) and Scenario 2 (DS1 2022) for Route 5 (South to North)**

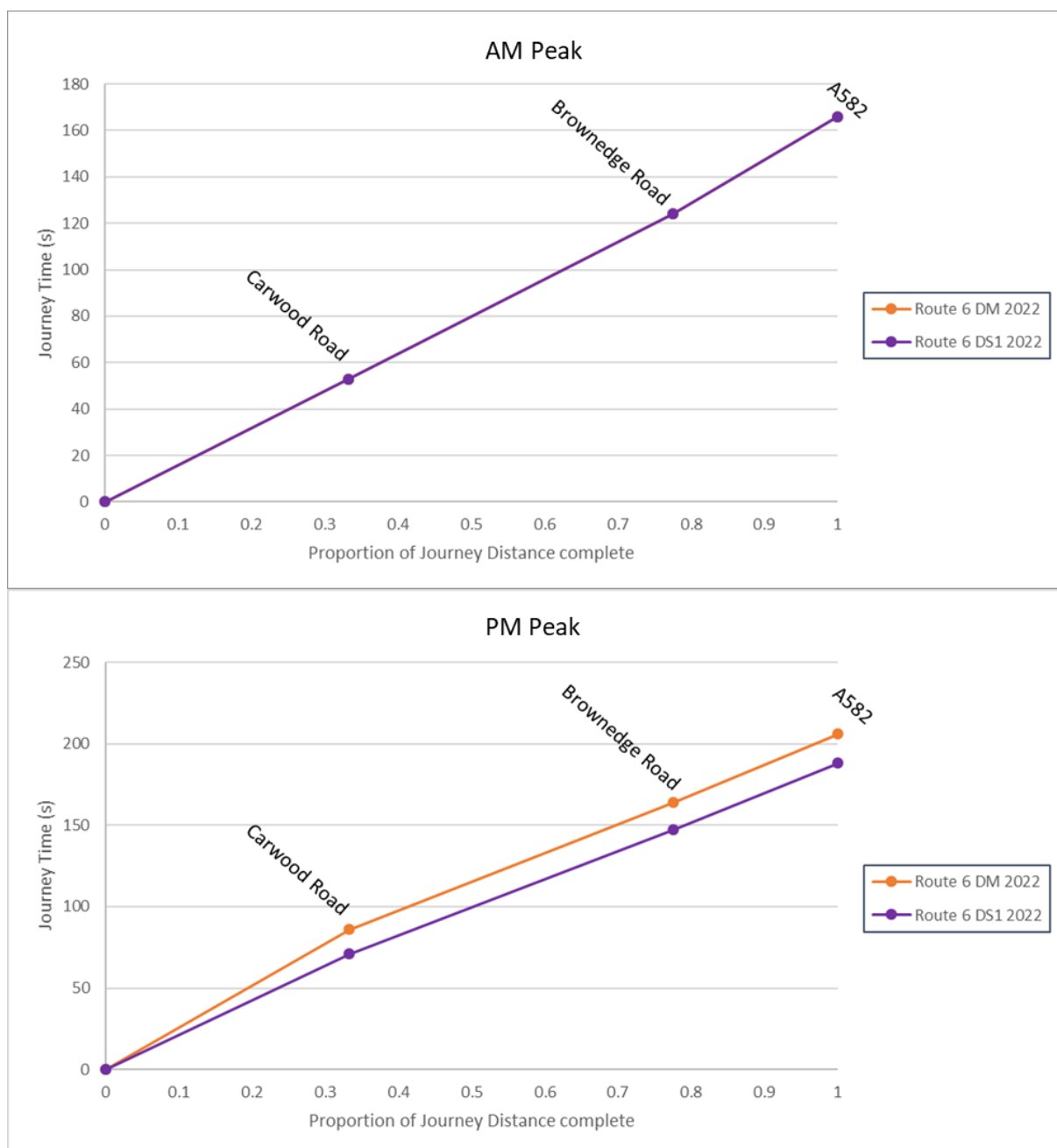




12.7.17 There is a small reduction in journey times in the DS1 compared to the DM for both peak periods in the 2022 forecast year. This may be caused by vehicles rerouting onto the upgraded A582 route from the A6. A similar pattern is shown along this route in the forecast year, 2037.

12.7.18 The average journey times for vehicles travelling southbound along the A6 between Victoria Road and the A582 (Route 6) are shown in Figure 12.16 for scenarios 1 and 2.

**Figure 12.16 AM Peak and PM Peak cumulative journey time plots Scenario 1 (DM 2022) and Scenario 2 (DS1 2022) for Route 6 (North to South)**



12.7.19 In the morning peak period there is no significant difference in journey times between the DM and DS1 for the forecast year 2022 along the A6. This is also the case for the DM, DS1 and DS2 for the 2037 forecast year. In the evening peak period there is a small reduction in journey times in the DS1 compared to the DM in the 2022 forecast year. This may be caused by vehicles rerouting onto the upgraded A582 route from the A6. The same is shown in the 2037 forecast year, but with a larger difference in journey times between the DM and DS1.

Directional Peak Period and Inter-Peak Flows

12.7.20 Tables 12.5 to 12.7 below show the traffic flows on the network assessed using the CLTM, traffic flow plots from the model are included in Appendix 12.6 in Volume 3 of this ES.

12.7.21 Table 12.5 shows the directional peak and inter peak traffic flows for DM and DS1 in 2022. The traffic flows are split down by vehicle class and the table also shows the percentage difference between DM and DS1.

**Table 12.5 Directional Flows: Scenario 1 and Scenario 2**

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 1 – DM 2022			Scenario 2 – DS1 2022			% Difference 2022 (DS1-DM)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
1	Golden Way: Oaks Wood roundabout to Broad Oak Roundabout.	NB	Car	1644	991	1248	1674	979	1292	1.8%	-1.2%	3.5%
			LGV	163	99	89	188	94	82	15.3%	-5.3%	-7.7%
			HGV	40	35	22	39	23	16	-1.8%	-34.0%	-27.7%
		SB	Car	832	910	1827	908	985	2044	9.2%	8.3%	11.8%
			LGV	128	176	83	142	181	105	10.9%	3.2%	26.9%
			HGV	20	29	30	21	28	33	6.5%	-4.0%	11.0%
2	Golden Way: Broad Oak Roundabout to Pope Lane	NB	Car	1199	710	1036	1163	690	1063	-2.9%	-2.8%	2.6%
			LGV	194	123	130	216	117	125	11.6%	-4.3%	-3.8%
			HGV	45	43	26	44	31	19	-3.1%	-27.6%	-25.4%
		SB	Car	578	509	853	678	580	1133	17.4%	14.0%	32.9%
			LGV	42	72	72	61	83	98	47.1%	14.7%	34.8%
			HGV	17	21	33	20	23	36	16.1%	11.6%	7.5%
3	Penwortham Way: Pope Lane to Chain House Lane	NB	Car	919	732	953	1021	704	967	11.0%	-3.8%	1.5%
			LGV	175	130	123	203	124	116	16.0%	-4.2%	-5.7%
			HGV	40	42	25	40	30	18	-0.6%	-28.8%	-26.6%
		SB	Car	814	552	881	966	654	1190	18.7%	18.5%	35.0%
			LGV	96	74	73	115	87	99	19.8%	17.0%	35.5%
			HGV	18	21	33	22	24	37	25.1%	12.2%	13.1%
4	Penwortham Way: Chain House Lane to A582/Flensburg (Tank) Roundabout	NB	Car	1024	1029	1205	976	994	1207	-4.6%	-3.4%	0.2%
			LGV	147	196	166	168	179	157	14.4%	-8.9%	-5.3%
			HGV	30	54	27	30	41	20	0.4%	-24.5%	-24.7%
		SB	Car	965	682	1003	1093	801	1351	13.2%	17.5%	34.7%
			LGV	118	92	84	134	123	121	13.4%	33.2%	43.7%
			HGV	22	27	34	28	35	40	23.5%	31.0%	18.7%
5	Flensburg Way: A582/Flensburg Roundabout to Longmeanygate Roundabout	NB	Car	1092	759	973	922	655	832	-15.6%	-13.7%	-14.6%
			LGV	230	181	113	232	130	95	0.7%	-27.9%	-15.4%
			HGV	54	69	37	49	61	30	-8.4%	-11.4%	-20.0%
		SB	Car	948	587	977	1130	671	1182	19.2%	14.3%	21.0%
			LGV	143	135	97	164	154	114	14.5%	14.4%	16.9%
			HGV	68	59	50	77	62	55	14.4%	6.0%	9.9%
6	Longmeanygate: Longmeanygate Roundabout to Golden Hill	EB	Car	549	578	505	647	543	604	17.7%	-6.0%	19.5%
			LGV	32	43	29	30	46	39	-7.1%	6.5%	36.0%
			HGV	20	23	10	26	22	15	27.0%	-6.5%	53.6%
		WB	Car	635	644	677	464	481	468	-27.0%	-25.4%	-30.9%

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 1 – DM 2022			Scenario 2 – DS1 2022			% Difference 2022 (DS1-DM)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
			LGV	69	52	22	67	45	18	-3.8%	-13.2%	-17.7%
			HGV	34	26	13	26	22	11	-22.1%	-16.0%	-19.5%
7	Flensburg Way: A582/Flensburg Roundabout to Croston Road roundabouts	EB	Car	1090	730	969	971	689	1091	-11.0%	-5.6%	12.6%
			LGV	208	170	98	209	145	106	0.6%	-15.2%	7.8%
			HGV	39	66	36	35	66	32	-9.2%	-0.8%	-12.2%
		WB	Car	911	880	1195	965	870	1267	5.9%	-1.1%	6.0%
			LGV	149	224	160	175	219	155	18.0%	-2.0%	-3.1%
			HGV	58	81	42	62	71	36	7.2%	-13.2%	-12.3%
8	Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	EB	Car	1168	852	1221	1059	762	1412	-9.4%	-10.5%	15.7%
			LGV	281	161	107	260	139	122	-7.5%	-13.7%	13.8%
			HGV	59	68	32	45	67	36	-24.3%	-2.1%	12.9%
		WB	Car	1016	994	1377	1090	970	1440	7.2%	-2.4%	4.6%
			LGV	187	217	169	213	210	155	14.1%	-3.1%	-8.5%
			HGV	63	83	40	66	72	35	4.2%	-13.0%	-13.0%
9	Lostock Lane: Stanifield Lane Roundabout to London Way / M65 roundabout	EB	Car	1742	1134	1839	1764	1142	1992	1.3%	0.7%	8.4%
			LGV	363	262	201	357	232	187	-1.6%	-11.5%	-6.9%
			HGV	96	127	63	93	127	57	-3.4%	-0.4%	-10.3%
		WB	Car	1584	1212	1927	1763	1189	2091	11.3%	-1.9%	8.5%
			LGV	289	240	232	281	225	210	-3.0%	-6.0%	-9.4%
			HGV	103	130	53	103	128	54	0.6%	-1.5%	0.3%
12	London Way: London Way / M65 roundabout to Brownedge Road	NB	Car	1523	1157	1844	1447	1154	1792	-5.0%	-0.3%	-2.8%
			LGV	189	129	61	196	139	61	3.2%	7.4%	0.8%
			HGV	46	35	14	49	35	14	5.9%	-0.2%	3.9%
		SB	Car	1681	1474	2183	1686	1432	2078	0.3%	-2.8%	-4.8%
			LGV	118	127	111	119	123	121	0.7%	-3.0%	8.8%
			HGV	48	38	15	50	37	16	3.1%	-0.6%	3.5%
13	London Way: Brownedge Road to Carrwood Road	NB	Car	1487	1006	1408	1396	1030	1350	-6.1%	2.4%	-4.1%
			LGV	176	123	46	188	134	45	7.0%	9.0%	-2.7%
			HGV	46	29	11	49	29	11	5.4%	0.7%	6.2%
		SB	Car	1217	1310	1962	1265	1275	1783	4.0%	-2.7%	-9.1%
			LGV	79	94	122	80	100	124	2.4%	6.4%	1.0%
			HGV	44	34	15	45	34	16	2.9%	-0.5%	3.1%
14	London Way: Carrwood Road to Victoria Road	NB	Car	1457	879	1063	1488	878	1089	2.2%	-0.1%	2.4%
			LGV	177	90	31	174	92	31	-1.8%	2.1%	-2.9%
			HGV	34	22	8	34	22	8	1.0%	0.4%	2.8%
		SB	Car	887	1195	1941	845	1190	1972	-4.7%	-0.5%	1.6%
			LGV	58	119	93	56	120	93	-3.2%	1.0%	-0.1%
			HGV	34	31	15	34	31	15	-0.4%	-0.8%	0.1%
15	Stanifield Lane: Watkin Lane / Stanifield Lane Roundabout to Wigan Road (A49)	NB	Car	610	268	595	609	265	590	-0.1%	-1.1%	-0.9%
			LGV	51	51	46	51	51	53	0.4%	0.8%	15.4%
			HGV	6	3	3	5	4	3	-10.6%	13.3%	-4.6%
		SB	Car	350	316	463	345	314	465	-1.4%	-0.6%	0.4%
			LGV	41	18	9	41	18	9	-1.0%	0.8%	1.7%
			HGV	13	3	4	11	3	3	-15.1%	5.1%	-16.1%
16	Watkin Lane: Stanifield Lane	NB	Car	161	159	310	261	161	425	62.1%	1.0%	37.1%

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 1 – DM 2022			Scenario 2 – DS1 2022			% Difference 2022 (DS1-DM)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
	Roundabout to Watkin Lane staggered signals (Brownedge Road)		LGV	103	16	35	73	7	34	-28.9%	-56.2%	-0.2%
			HGV	20	24	4	19	34	10	-5.1%	41.4%	140.2%
			Car	320	209	121	363	194	117	13.7%	-7.4%	-3.6%
			LGV	56	58	33	48	46	8	-14.1%	-21.4%	-76.5%
			HGV	34	40	19	28	38	15	-17.9%	-5.7%	-24.0%
17	Watkin Lane: Watkin Lane staggered signals (Brownedge Road) to Bee Lane	NB	Car	312	162	239	301	140	357	-3.3%	-13.9%	49.1%
			LGV	110	18	38	69	9	40	-37.7%	-50.7%	5.2%
			HGV	20	20	2	18	30	8	-9.1%	49.3%	268.9%
		SB	Car	205	189	200	141	157	142	-30.9%	-17.0%	-29.2%
			LGV	65	58	28	53	40	12	-19.1%	-30.1%	-58.7%
			HGV	29	35	18	22	32	13	-24.3%	-6.6%	-26.8%
18	Leyland Road: Bee Lane to A59 roundabout	NB	Car	737	330	388	635	330	305	-13.8%	0.1%	-21.5%
			LGV	102	28	25	85	28	24	-17.1%	-0.4%	-3.3%
			HGV	25	21	3	22	31	8	-10.9%	43.4%	200.3%
		SB	Car	315	409	895	247	370	690	-21.6%	-9.4%	-23.0%
			LGV	50	47	97	39	40	97	-22.8%	-13.3%	-0.6%
			HGV	23	33	19	19	32	15	-16.6%	-2.5%	-20.9%
19	Croston Road: Croston Road roundabout to Watkin Lane	NB	Car	31	33	71	67	38	78	113.7%	15.2%	10.1%
			LGV	17	3	18	15	5	18	-11.4%	43.9%	1.3%
			HGV	14	7	2	12	7	2	-11.6%	-0.1%	2.4%
		SB	Car	207	55	117	133	40	69	-35.6%	-27.3%	-40.9%
			LGV	32	10	7	29	8	7	-8.8%	-22.9%	4.4%
			HGV	12	9	3	11	8	2	-3.0%	-3.9%	-8.4%
20	Leyland Lane: Golden Hill to Croston roundabout.	NB	Car	91	90	84	167	123	133	84.3%	36.4%	58.3%
			LGV	76	19	27	78	21	28	3.2%	9.2%	4.2%
			HGV	0	0	0	0	0	0	0.0%	-1.3%	0.0%
		SB	Car	117	148	265	102	133	239	-13.3%	-9.9%	-9.7%
			LGV	57	17	25	59	15	17	3.6%	-14.9%	-34.4%
			HGV	0	0	0	0	0	0	N/A	N/A	N/A

12.7.22 With the scheme in place the traffic flows on the A582 from A59 Liverpool Road all the way to the A582/Flensburg Way (Tank) Roundabout increase in the southbound direction in all modelled periods. Over this section in the northbound direction there is no discernible pattern, with some increases and some decreases. This pattern northbound and southbound is also shown on the B5253 Flensburg Way between the Tank Roundabout and the Longmeanygate junction.

12.7.23 Traffic flows along the A582 between Watkin Lane and the A582/Flensburg Way (Tank) Roundabout increase in the westbound direction with the scheme in place, in both the morning and evening peak periods. In the eastbound direction over this length traffic flows are reduced in the morning peak but increase in the evening peak.

12.7.24 Over the B5242 Watkin Lane/Leyland Road corridor between the A582 and Browndge Road traffic flows increase in the northbound direction in both peak periods with the scheme in place. In the southbound direction there is an increase in flow in the morning peak with the scheme in place, in the evening peak there is little change with and without the scheme. Between Browndge Road and Beel Lane there is an increase in flow northbound in the evening peak with the scheme in place and no change in the morning peak. In the southbound direction there is a reduction

in traffic flow with the scheme in place in both peak periods. From Bee Lane to the A59 Liverpool Road traffic flows reduce northbound and southbound in both peak periods with the scheme in place.

12.7.25 Over the length of the A6 London Way from the M65 roundabout to Victoria Road there is no significant change in traffic flow as a result of the scheme in either direction in both peak periods.

12.7.26 Table 12.6 shows the directional peak and inter peak traffic flows for DM and DS1 in 2037. The traffic flows are split down by vehicle class and the table also shows the percentage difference between DM and DS1.

**Table 12.6 Directional Flows: Scenario 3 and Scenario 4**

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 3 – DM 2037			Scenario 4 – DS1 2037			% Difference 2037 (DS1-DM)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
1	Golden Way: Oaks Wood Roundabout to Broad Oak Roundabout.	NB	Car	2019	1164	1423	2055	1158	1479	1.8%	-0.5%	3.9%
			LGV	224	159	114	280	153	107	24.9%	-4.1%	-6.0%
			HGV	36	26	21	37	25	20	3.8%	-4.0%	-1.9%
		SB	Car	1039	1076	2122	1130	1141	2274	8.7%	6.0%	7.2%
			LGV	150	224	130	176	237	167	17.2%	5.7%	28.2%
			HGV	21	32	32	21	32	32	-2.8%	0.9%	-0.7%
2	Golden Way: Broad Oak Roundabout to Pope Lane	NB	Car	1528	845	1225	1377	828	1257	-9.9%	-1.9%	2.6%
			LGV	248	164	168	257	158	163	3.5%	-4.0%	-2.7%
			HGV	41	35	24	42	33	23	1.4%	-3.4%	-5.2%
		SB	Car	644	606	1153	747	684	1338	16.0%	13.0%	16.1%
			LGV	44	99	101	74	115	142	69.9%	16.2%	39.8%
			HGV	20	24	34	19	25	33	-0.3%	6.6%	-3.5%
3	Penwortham Way: Pope Lane to Chain House Lane	NB	Car	1330	860	1067	1430	838	1093	7.5%	-2.6%	2.5%
			LGV	228	173	156	260	165	145	14.3%	-4.9%	-6.9%
			HGV	38	33	23	40	32	22	6.5%	-4.2%	-1.8%
		SB	Car	868	661	1211	1041	788	1461	20.0%	19.1%	20.6%
			LGV	116	105	103	144	122	146	25.0%	16.1%	41.6%
			HGV	21	24	35	23	26	36	9.8%	9.1%	3.7%
4	Penwortham Way: Chain House Lane to A582/Flensburg Way (Tank) Roundabout	NB	Car	1127	1148	1246	1113	1154	1307	-1.3%	0.5%	4.8%
			LGV	164	247	207	189	239	197	15.3%	-3.0%	-4.9%
			HGV	25	50	26	31	43	25	25.8%	-14.0%	-4.9%
		SB	Car	1051	773	1281	1146	896	1507	9.0%	15.9%	17.6%
			LGV	101	146	118	169	166	163	66.8%	13.1%	38.8%
			HGV	10	35	36	28	37	38	178.6%	6.5%	6.3%
5	Flensburg Way: A582/Flensburg Way Roundabout to Longmeanygate Roundabout	NB	Car	1136	907	1203	1207	781	1039	6.3%	-13.8%	-13.6%
			LGV	288	194	143	303	171	136	5.3%	-11.9%	-4.9%
			HGV	51	72	40	51	64	36	0.4%	-10.8%	-9.6%
		SB	Car	1061	703	1126	1139	806	1385	7.4%	14.6%	22.9%
			LGV	173	172	119	192	204	157	11.0%	18.6%	31.4%
			HGV	61	59	50	63	69	56	3.5%	17.9%	10.9%
6	Longmeanygate: Longmeanygate Roundabout to Golden Hill	EB	Car	734	596	438	661	655	595	-10.0%	9.9%	35.7%
			LGV	30	45	36	30	62	43	2.5%	39.5%	19.7%



Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 3 – DM 2037			Scenario 4 – DS1 2037			% Difference 2037 (DS1-DM)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
		WB	HGV	16	18	11	17	23	14	3.0%	26.7%	21.4%
			Car	586	711	732	627	553	543	7.0%	-22.2%	-25.8%
			LGV	62	64	25	79	52	26	26.8%	-18.6%	3.4%
			HGV	23	26	11	26	21	11	15.1%	-19.6%	-6.5%
7	Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Croston Road Roundabouts	EB	Car	990	839	1187	1141	793	1220	15.3%	-5.5%	2.7%
			LGV	225	211	122	284	188	138	26.3%	-10.6%	12.6%
			HGV	28	76	39	42	69	35	50.5%	-9.2%	-10.2%
		WB	Car	934	1059	1269	964	1099	1447	3.1%	3.8%	14.1%
			LGV	171	283	184	194	288	184	13.9%	2.0%	-0.1%
			HGV	51	75	38	55	77	40	9.3%	2.5%	4.1%
8	Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	EB	Car	1256	974	1438	1362	936	1612	8.5%	-3.9%	12.1%
			LGV	362	202	162	346	184	196	-4.5%	-9.1%	20.7%
			HGV	64	90	37	69	71	39	7.7%	-21.0%	4.1%
		WB	Car	1042	1142	1370	1295	1142	1467	24.3%	0.0%	7.1%
			LGV	160	270	187	254	271	181	58.9%	0.3%	-3.4%
			HGV	57	77	37	72	78	38	25.2%	2.1%	1.6%
9	Lostock Lane: Stanifield Lane Roundabout to London Way / M65 Roundabout	EB	Car	1944	1374	2349	2021	1381	2514	4.0%	0.5%	7.1%
			LGV	495	269	238	485	265	250	-2.0%	-1.5%	5.2%
			HGV	109	132	63	113	127	59	3.6%	-3.5%	-6.2%
		WB	Car	1925	1441	2139	2155	1442	2297	11.9%	0.1%	7.4%
			LGV	327	286	264	361	318	258	10.4%	11.1%	-2.4%
			HGV	96	137	50	100	139	50	3.4%	1.5%	-0.7%
12	London Way: London Way / M65 Roundabout to Browndge Road	NB	Car	1522	1428	1769	1496	1417	1697	-1.8%	-0.8%	-4.0%
			LGV	265	183	67	269	162	73	1.4%	-11.7%	9.4%
			HGV	47	39	13	49	39	13	4.6%	-0.5%	2.7%
		SB	Car	1824	1778	2009	1819	1735	2001	-0.3%	-2.4%	-0.4%
			LGV	150	194	137	170	187	96	13.4%	-3.6%	-30.0%
			HGV	47	38	14	49	38	16	4.9%	2.0%	14.9%
13	London Way: Browndge Road to Carrwood Road	NB	Car	1533	1240	1454	1444	1243	1349	-5.8%	0.2%	-7.2%
			LGV	259	181	54	256	157	55	-1.1%	-12.9%	1.4%
			HGV	38	32	10	40	32	11	3.7%	-1.1%	3.6%
		SB	Car	1478	1507	1941	1473	1470	1990	-0.3%	-2.5%	2.6%
			LGV	103	167	146	121	163	117	17.6%	-2.4%	-20.0%
			HGV	45	36	14	48	36	17	4.7%	1.2%	21.1%
14	London Way: Carrwood Road to Victoria Road	NB	Car	1542	1082	1110	1542	1075	1158	0.0%	-0.6%	4.3%
			LGV	241	115	33	241	119	36	0.2%	3.6%	7.0%
			HGV	32	24	7	32	24	8	0.5%	-0.5%	5.0%
		SB	Car	813	1367	2019	831	1365	2233	2.1%	-0.2%	10.6%
			LGV	62	151	104	64	153	123	2.8%	1.3%	19.0%
			HGV	32	32	14	34	32	17	4.1%	-0.3%	19.7%
15	Stanifield Lane: Stanifield Lane Roundabout to Wigan Road (A49)	NB	Car	744	352	658	735	353	679	-1.2%	0.2%	3.1%
			LGV	128	67	57	105	68	55	-18.0%	0.6%	-3.0%
			HGV	18	4	8	13	5	8	-23.8%	14.1%	-1.9%
		SB	Car	385	326	491	401	328	487	4.3%	0.6%	-0.8%
			LGV	66	27	9	51	24	11	-23.7%	-11.7%	21.6%

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 3 – DM 2037			Scenario 4 – DS1 2037			% Difference 2037 (DS1-DM)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
			HGV	8	8	3	3	6	3	-63.4%	-17.1%	4.8%
16	Watkin Lane: Stanifield Lane Roundabout to Watkin Lane staggered signals (Brownedge Road)	NB	Car	363	223	473	447	227	559	23.2%	1.6%	18.1%
			LGV	177	9	43	138	35	44	-21.9%	286.5%	1.8%
			HGV	30	37	7	27	37	8	-11.4%	2.4%	4.1%
		SB	Car	394	172	209	482	157	250	22.4%	-8.6%	19.6%
			LGV	83	18	15	58	18	20	-30.6%	-0.5%	30.9%
			HGV	34	34	17	28	32	15	-17.6%	-5.6%	-12.5%
17	Watkin Lane: Watkin Lane staggered signals (Brownedge Road) to Bee Lane	NB	Car	317	239	365	280	236	462	-11.8%	-0.9%	26.5%
			LGV	131	12	48	96	38	48	-26.9%	211.8%	0.1%
			HGV	29	33	6	24	33	5	-17.7%	2.4%	-1.4%
		SB	Car	210	243	278	118	209	212	-43.7%	-14.1%	-23.7%
			LGV	92	12	13	43	8	12	-53.1%	-34.6%	-6.9%
			HGV	28	29	15	20	27	12	-28.5%	-7.0%	-16.4%
18	Leyland Road: Bee Lane to A59 roundabout	NB	Car	943	425	447	830	403	341	-12.0%	-5.1%	-23.7%
			LGV	155	48	31	120	45	29	-22.7%	-5.3%	-6.2%
			HGV	36	34	6	32	34	6	-12.7%	0.5%	-3.7%
		SB	Car	413	504	862	252	454	793	-39.0%	-10.0%	-8.0%
			LGV	74	58	116	41	47	93	-44.4%	-17.9%	-19.7%
			HGV	24	30	16	18	28	14	-24.8%	-4.1%	-10.3%
19	Croston Road: Croston Road roundabout to Watkin Lane	NB	Car	117	37	88	130	41	102	10.6%	11.7%	16.1%
			LGV	7	6	23	18	6	23	152.6%	1.1%	2.5%
			HGV	16	8	2	11	8	2	-27.3%	0.8%	14.7%
		SB	Car	300	67	149	114	46	93	-62.2%	-30.5%	-37.5%
			LGV	95	13	14	23	10	8	-75.7%	-23.5%	-38.6%
			HGV	30	9	3	10	9	2	-65.5%	-2.3%	-7.9%
20	Leyland Lane: Golden Hill to Croston roundabout.	NB	Car	275	110	166	235	164	224	-14.8%	48.7%	34.7%
			LGV	98	25	43	60	28	37	-38.9%	12.9%	-12.5%
			HGV	0	0	0	0	0	0	1.1%	0.0%	2.8%
		SB	Car	72	144	210	73	130	199	0.9%	-9.7%	-5.3%
			LGV	52	19	18	48	16	20	-7.9%	-14.4%	7.9%
			HGV	0	0	0	0	0	0	N/A	N/A	N/A

12.7.27 As with the 2022 results with the scheme in place the traffic flows on the A582 from A59 Liverpool Road all the way to the A582/Flensburg Way (Tank) Roundabout increase in the southbound direction in all modelled periods. Over this section in the northbound direction there is no discernible pattern, with some increases and some decreases. This pattern northbound and southbound is also shown on the B5253 Flensburg Way between the Tank Roundabout and the Longmeanygate junction.

12.7.28 Traffic flows along the A582 between Watkin Lane and the A582/Flensburg (Tank) Roundabout increase in both directions with the scheme in place, in both the morning and evening peak periods.

12.7.29 Over the B5242 Watkin Lane/Leyland Road corridor between the A582 and Brownedge Road traffic flows increase in both directions in both peak periods with the scheme in place. Between Brownedge Road and Beel Lane there is a decrease in both directions in both peak periods with the scheme in place. From Bee Lane to the A59 Liverpool Road traffic flows reduce in both directions in both peak periods with the scheme in place.

12.7.30 As with the 2022 results, over the length of the A6 London Way from the M65 roundabout to Victoria Road there is no significant change in traffic flow as a result of the scheme in either direction in both peak periods.

12.7.31 Table 12.7 shows the directional peak and inter peak traffic flows for DS1 and DS2 in 2037. The traffic flows are split down by vehicle class and the table also shows the percentage difference between DS1 and DS2.

**Table 12.7 Directional Flows: Scenario 4 and Scenario 5**

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 4 – DS1 2037			Scenario 5 – DS2 2037			% Difference 2037 (DS2-DS1)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
1	Golden Way: Oaks Wood Roundabout to Broad Oak Roundabout.	NB	Car	2055	1158	1479	2025	1138	1427	-1.5%	-1.8%	-3.5%
			LGV	280	153	107	216	141	105	-22.9%	-7.8%	-2.1%
			HGV	37	25	20	34	26	16	-9.1%	6.1%	-21.7%
		SB	Car	1130	1141	2274	1023	1099	2084	-9.4%	-3.8%	-8.3%
			LGV	176	237	167	158	225	141	-10.6%	-5.1%	-15.1%
			HGV	21	32	32	20	33	32	-4.5%	1.3%	1.4%
2	Golden Way: Broad Oak Roundabout to Pope Lane	NB	Car	1377	828	1257	1516	819	1222	10.1%	-1.1%	-2.8%
			LGV	257	158	163	244	138	162	-4.8%	-12.4%	-0.9%
			HGV	42	33	23	39	35	18	-7.1%	4.6%	-19.3%
		SB	Car	747	684	1338	635	645	1143	-15.0%	-5.7%	-14.6%
			LGV	74	115	142	51	102	114	-31.4%	-10.9%	-19.3%
			HGV	19	25	33	18	25	33	-6.9%	-2.2%	0.4%
3	Penwortham Way: Pope Lane to Chain House Lane	NB	Car	1430	838	1093	1338	808	1041	-6.4%	-3.6%	-4.7%
			LGV	260	165	145	227	145	150	-12.9%	-11.8%	3.5%
			HGV	40	32	22	37	33	18	-8.6%	4.4%	-20.0%
		SB	Car	1041	788	1461	875	727	1251	-16.0%	-7.8%	-14.4%
			LGV	144	122	146	122	109	118	-15.6%	-10.5%	-18.8%
			HGV	23	26	36	20	26	35	-12.5%	-3.5%	-2.2%
4	Penwortham Way: Chain House Lane to A582/Flensburg Way (Tank) Roundabout	NB	Car	1113	1154	1307	1096	1130	1303	-1.5%	-2.1%	-0.3%
			LGV	189	239	197	170	220	202	-10.0%	-8.2%	2.4%
			HGV	31	43	25	28	50	22	-10.8%	16.7%	-12.0%
		SB	Car	1146	896	1507	1164	876	1367	1.6%	-2.2%	-9.3%
			LGV	169	166	163	167	157	144	-0.8%	-5.2%	-11.7%
			HGV	28	37	38	37	44	40	32.4%	18.8%	6.1%
5	Flensburg Way: A582/Flensburg Way (Tank) roundabout to Longmeanygate Roundabout	NB	Car	1207	781	1039	1174	780	1029	-2.7%	-0.1%	-1.0%
			LGV	303	171	136	284	168	125	-6.5%	-1.7%	-7.9%
			HGV	51	64	36	48	65	36	-5.6%	1.2%	1.7%
		SB	Car	1139	806	1385	1169	809	1385	2.6%	0.4%	0.0%
			LGV	192	204	157	196	200	146	2.1%	-2.0%	-6.6%
			HGV	63	69	56	64	69	55	1.3%	-0.1%	-1.4%

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 4 – DS1 2037			Scenario 5 – DS2 2037			% Difference 2037 (DS2-DS1)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
6	Longmeanygate: Longmeanygate Roundabout to Golden Hill	EB	Car	661	655	595	679	659	589	2.7%	0.5%	-1.0%
			LGV	30	62	43	31	58	42	3.7%	-7.4%	-0.6%
			HGV	17	23	14	17	23	14	2.1%	-1.1%	-2.2%
		WB	Car	627	553	543	595	546	541	-5.1%	-1.2%	-0.4%
			LGV	79	52	26	68	51	24	-14.1%	-3.0%	-6.4%
7	Flensburg Way:A582/Flensburg Way (Tank) Roundabout to Croston Road roundabouts	EB	Car	1141	793	1220	1125	777	1061	-1.4%	-2.0%	-13.0%
			LGV	284	188	138	273	182	123	-4.1%	-3.3%	-10.9%
			HGV	42	69	35	53	77	38	24.4%	11.5%	10.4%
		WB	Car	964	1099	1447	973	1084	1435	0.9%	-1.4%	-0.8%
			LGV	194	288	184	188	270	193	-3.2%	-6.3%	4.9%
8	Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	EB	Car	1362	936	1612	1314	937	1482	-3.5%	0.0%	-8.0%
			LGV	346	184	196	359	179	189	3.9%	-2.5%	-3.3%
			HGV	69	71	39	70	70	40	1.6%	-1.4%	4.2%
		WB	Car	1295	1142	1467	1298	1124	1460	0.3%	-1.6%	-0.5%
			LGV	254	271	181	228	257	190	-10.0%	-4.8%	4.8%
9	Lostock Lane: Stanifield Lane Roundabout to London Way / M65 Roundabout	EB	Car	2021	1381	2514	1950	1385	2387	-3.5%	0.3%	-5.1%
			LGV	485	265	250	495	261	243	2.1%	-1.2%	-2.7%
			HGV	113	127	59	120	128	62	5.6%	0.3%	4.8%
		WB	Car	2155	1442	2297	2042	1405	2213	-5.2%	-2.6%	-3.6%
			LGV	361	318	258	352	282	266	-2.3%	-11.2%	3.2%
12	London Way: London Way / M65 Roundabout to Brownedge Road	NB	Car	1496	1417	1697	1549	1479	1783	3.6%	4.4%	5.0%
			LGV	269	162	73	256	204	72	-4.7%	26.2%	-1.7%
			HGV	49	39	13	45	39	13	-8.4%	-0.2%	0.0%
		SB	Car	1819	1735	2001	1846	1770	2058	1.5%	2.0%	2.9%
			LGV	170	187	96	153	195	122	-10.1%	4.6%	26.8%
13	London Way: Brownedge Road to Carrwood Road	NB	Car	1444	1243	1349	1530	1279	1479	6.0%	3.0%	9.7%
			LGV	256	157	55	252	202	55	-1.4%	28.2%	-0.2%
			HGV	40	32	11	36	32	11	-9.2%	0.5%	-0.1%
		SB	Car	1473	1470	1990	1497	1521	1983	1.6%	3.5%	-0.4%
			LGV	121	163	117	105	168	132	-13.1%	3.1%	12.6%
14	London Way: Carrwood Road to Victoria Road	NB	Car	1542	1075	1158	1539	1059	1110	-0.2%	-1.5%	-4.2%
			LGV	241	119	36	239	120	34	-0.7%	1.1%	-4.1%
			HGV	32	24	8	31	24	8	-3.1%	0.1%	-0.7%
		SB	Car	831	1365	2233	812	1360	1976	-2.3%	-0.4%	-11.5%
			LGV	64	153	123	64	156	101	0.4%	1.8%	-18.6%
15	Stanifield Lane: Stanifield Lane Roundabout to Wigan Road (A49)	NB	Car	735	353	679	738	349	685	0.4%	-1.0%	0.8%
			LGV	105	68	55	112	68	55	7.0%	0.5%	-0.2%
			HGV	13	5	8	16	5	7	20.0%	12.3%	-3.9%

Link	Description	Direction	Vehicle Type	Directional Flows								
				Scenario 4 – DS1 2037			Scenario 5 – DS2 2037			% Difference 2037 (DS2-DS1)		
				AM	IP	PM	AM	IP	PM	AM	IP	PM
		SB	Car	401	328	487	400	325	482	-0.3%	-1.2%	-1.1%
			LGV	51	24	11	53	25	12	4.0%	4.6%	6.9%
			HGV	3	6	3	3	7	3	3.9%	8.7%	1.0%
16	Watkin Lane: Stanifield Lane Roundabout to Watkin Lane staggered signals (Browndedge Road)	NB	Car	447	227	559	347	203	493	-22.4%	-10.5%	-11.8%
			LGV	138	35	44	162	11	48	17.3%	-66.9%	8.3%
			HGV	27	37	8	32	38	12	20.1%	0.6%	61.6%
		SB	Car	482	157	250	473	167	213	-1.9%	6.6%	-14.8%
			LGV	58	18	20	78	19	20	34.9%	2.8%	-3.3%
			HGV	28	32	15	34	34	16	22.5%	5.2%	11.5%
17	Watkin Lane: Watkin Lane staggered signals (Browndedge Road) to Bee Lane	NB	Car	280	236	462	297	209	343	6.1%	-11.6%	-25.7%
			LGV	96	38	48	132	14	51	38.0%	-63.4%	5.5%
			HGV	24	33	5	31	34	10	29.8%	1.3%	91.7%
		SB	Car	118	209	212	196	199	238	65.2%	-4.6%	12.3%
			LGV	43	8	12	82	15	13	90.5%	86.3%	7.1%
			HGV	20	27	12	28	29	14	42.7%	7.0%	16.8%
18	Leyland Road: Bee Lane to A59 Roundabout	NB	Car	830	403	341	948	441	450	14.2%	9.6%	31.7%
			LGV	120	45	29	156	65	34	30.6%	44.1%	15.8%
			HGV	32	34	6	39	34	11	21.0%	1.4%	85.1%
		SB	Car	252	454	793	428	507	897	69.6%	11.7%	13.1%
			LGV	41	47	93	65	57	103	56.3%	20.7%	11.1%
			HGV	18	28	14	24	29	15	35.1%	4.1%	7.6%
19	Croston Road: Croston Road Roundabout to Watkin Lane	NB	Car	130	41	102	136	38	89	4.5%	-8.2%	-12.7%
			LGV	18	6	23	15	6	23	-17.6%	-0.5%	-0.5%
			HGV	11	8	2	9	0	0	-17.0%	-100.0%	-100.0%
		SB	Car	114	46	93	121	46	107	6.7%	0.1%	15.1%
			LGV	23	10	8	40	10	10	73.4%	0.3%	13.8%
			HGV	10	9	2	0	0	0	-100.0%	-100.0%	-100.0%
20	Leyland Lane: Golden Hill to Croston Roundabout.	NB	Car	235	164	224	215	166	234	-8.2%	1.2%	4.3%
			LGV	60	28	37	85	28	45	42.2%	0.7%	19.8%
			HGV	0	0	0	0	0	0	0.0%	0.0%	0.0%
		SB	Car	73	130	199	75	128	203	4.0%	-1.3%	2.3%
			LGV	48	16	20	48	20	20	0.4%	24.3%	-0.8%
			HGV	0	0	0	0	0	0	N/A	N/A	N/A

12.7.32 Without Pickering Farm Link Road, the traffic flows are lower southbound on the A582 from A59 Liverpool Road all the way to the Chainhouse Lane in all modelled periods. Over this section in the northbound direction there is no discernible pattern. Elsewhere on the A582 the removal of Pickering Farm Link Road has no discernible impact.

12.7.33 Over the B5242 Watkin Lane/Leyland Road corridor between the A582 and Browndedge Road traffic are lower in both directions in both peak periods with the scheme in place. Between Browndedge Road and Beel Lane traffic flows are lower in the evening peak without Pickering Farm Link Road, in the southbound direction on this link traffic flows increase, both peaks, without the Pickering Farm Link Road. From Bee Lane to the A59 Liverpool Road traffic flows increase in both directions in both peak periods when the Pickering Farm Link Road is not in place.



Annual Average Weekday Traffic (AADT)

**Table 12.8 AADT: Scenario 1 to Scenario 5**

Link	Description	AADT (veh)				
		Scenario 1 – DM 2022	Scenario 2 – DS1 2022	Scenario 3 – DM 2037	Scenario 4 – DS1 2037	Scenario 5 – DS2 2037
1	Golden Way: Oaks Wood Roundabout to Broad Oak Roundabout.	31558	33177	37663	39382	37376
2	Golden Way: Broad Oak Roundabout to Pope Lane	21224	22919	26003	27296	25860
3	Penwortham Way: Pope Lane to Chain House Lane	21401	23766	26272	28847	26331
4	Penwortham Way: Chain House Lane to A582/Flensburg Way (Tank) Roundabout	15290	14800	16819	16986	16675
5	Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Longmeanygate roundabout	13161	11208	15291	13965	13741
6	Longmeanygate: Longmeanygate Roundabout to Golden Hill	15627	13862	16418	15772	15615
7	Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Croston Road roundabouts	14544	14821	16317	17378	17212
8	Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	30951	30864	34582	36327	35487
9	Lostock Lane: Stanifield Lane Roundabout to London Way / M65 roundabout	43446	44515	51089	53257	51687
12	London Way: London Way / M65 Roundabout to Brownedge Road	40923	40035	44795	43916	45466
13	London Way: Brownedge Road to	35112	34241	39565	38740	40219

Link	Description	AADT (veh)				
		Scenario 1 – DM 2022	Scenario 2 – DS1 2022	Scenario 3 – DM 2037	Scenario 4 – DS1 2037	Scenario 5 – DS2 2037
	Carrwood Road					
14	London Way: Carrwood Road to Victoria Road	31166	31309	34355	35414	34062
15	Stanifield Lane: Stanifield Lane Roundabout to Wigan Road (A49)	10399	10367	12167	12126	12134
16	Watkin Lane: Stanifield Lane Roundabout to Watkin Lane staggered signals (Browndedge Road)	6463	6851	8186	8966	8306
17	Watkin Lane: Watkin Lane staggered signals (Browndedge Road) to Bee Lane	6447	5854	7818	7280	7128
18	Leyland Road: Bee Lane to A59 Roundabout	13129	11393	15600	13531	15957
19	Croston Road: Croston Road roundabout to Watkin Lane	2211	1894	3152	2256	2168
20	Leyland Lane: Golden Hill to Croston Roundabout.	3841	4153	4483	4673	4797

12.7.34 On A582 between the A59 and Chain House Lane the scheme leads to an increase in traffic flow in both 2022 and 2037. However, the removal of the Pickering's Farm Link Road, DS2, leads to decrease in traffic flow over this section. On the A582 between Chain House Lane and the A582/Flensburg Way (Tank) Roundabout there is a slight decrease in in traffic flow in 2022 and a slight increase in traffic flow in 2037 in DS1. Over this length of A582 the flows are lower when the Pickering Farm Link Road is removed. Traffic flows reduce on the B5253 between the A582/ Flensburg Way (Tank) Roundabout and the Longmeanygate junction with the scheme in place in both 2022 and 2037.

12.7.35 On the A582 between the Tank Roundabout and Croston Road traffic flows increase both in 2022 and 2037 with the scheme. On the next section of the A582 between Croston Roads and Watkin Lane traffic flows are broadly similar with and without the scheme in 2022. Over this section in 2037 traffic flows increase with the scheme in place.

12.7.36 Traffic flows on B5254 Watkin Lane/Leyland Road between Browndedge Road and A59 Liverpool Road decrease with the scheme in place both in 2022 and 2037. With the removal of the Pickering's Farm Link Road (DS2) traffic flows are higher than DM on the section of B5254 Watkin Lane/Leyland Road between Bee Lane and A59 Liverpool Road, over the section between Browndedge Road and Bee Lane traffic flows are lower than DM.

Daily Percentage HGV

**Table12.9 Daily Percentage of HGVs: Scenario 1 to Scenario 5**

Link	Description	Daily Percentage HGV				
		Scenario 1 – DM 2022	Scenario 2 – DS1 2022	Scenario 3 – DM 2037	Scenario 4 – DS1 2037	Scenario 5 – DS2 2037
1	Golden Way: Oaks Wood Roundabout to Broad Oak Roundabout.	2%	2%	1%	1%	1%
2	Golden Way: Broad Oak Roundabout to Pope Lane	3%	3%	2%	2%	2%
3	Penwortham Way: Pope Lane to Chain House Lane	3%	2%	2%	2%	2%
4	Penwortham Way: Chain House Lane to A582/Flensburg Way (Tank) Roundabout	3%	2%	2%	2%	2%
5	Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Longmeanygate Roundabout	4%	5%	4%	4%	4%
6	Longmeanygate: Longmeanygate Roundabout to Golden Hill	3%	3%	2%	3%	2%
7	Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Croston Road roundabouts	5%	4%	4%	4%	4%
8	Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	4%	4%	4%	4%	4%
9	Lostock Lane: Stanifield Lane Roundabout to London Way / M65 Roundabout	5%	5%	4%	4%	4%
12	London Way: London Way / M65 Roundabout to Brownedge Road	2%	2%	2%	2%	2%
13	London Way:	2%	2%	2%	2%	2%

Link	Description	Daily Percentage HGV				
		Scenario 1 – DM 2022	Scenario 2 – DS1 2022	Scenario 3 – DM 2037	Scenario 4 – DS1 2037	Scenario 5 – DS2 2037
	Brownedge Road to Carrwood Road					
14	London Way: Carrwood Road to Victoria Road	2%	2%	2%	2%	2%
15	Stanifield Lane: Stanifield Lane Roundabout to Wigan Road (A49)	2%	2%	2%	2%	2%
16	Watkin Lane: Stanifield Lane Roundabout to Watkin Lane staggered signals (Brownedge Road)	13%	13%	12%	11%	12%
17	Watkin Lane: Watkin Lane staggered signals (Brownedge Road) to Bee Lane	7%	9%	8%	7%	8%
18	Leyland Road: Bee Lane to A59 Roundabout	5%	6%	5%	6%	5%
19	Croston Road: Croston Road Roundabout to Watkin Lane	8%	10%	8%	10%	8%
20	Leyland Lane: Golden Hill to Croston roundabout.	1%	1%	1%	1%	1%

12.7.37 There is very little variation in the proportion of vehicles that are HGVs across the scenarios. In most cases, any difference is only a 1% change. The highest proportions of HGVs across the models are on the B5253 Watkin Lane in 2022, between the A582 and Brownedge Road, where the proportion is 13%. The percentage HGV reduces further along the B5253 corridor all the way to the A59 Liverpool Road, however this is a consequence of the increase in overall flow as the absolute number of HGVs along the corridor changes very little. The lowest proportions are on link 20, where the percentage is one percent in all five scenarios.



### Summary of Link Assessment

12.7.38 The following are the main points that can be inferred from the link assessment for all 5 Scenarios:

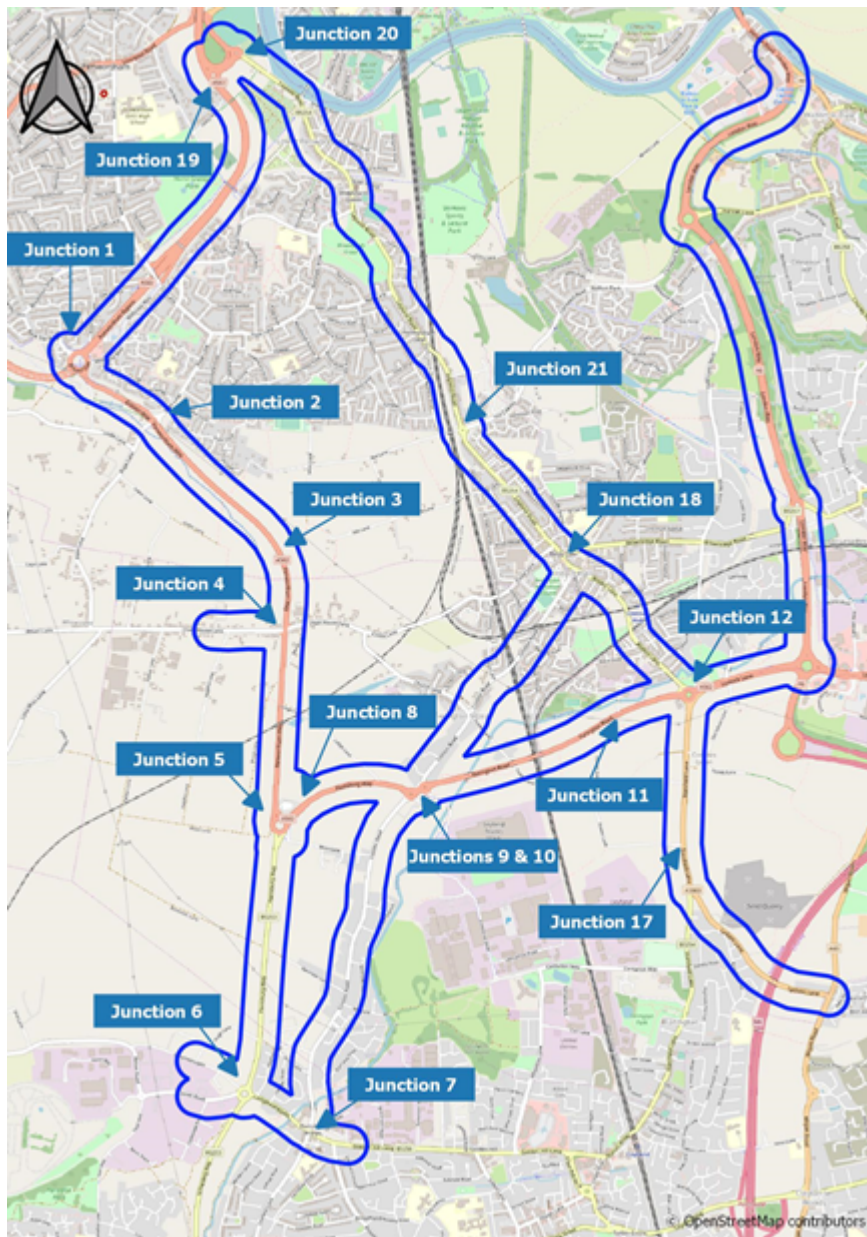
- There is an overall increase in the volume of traffic using the A582 corridor as a result of the increased capacity provided with the implementation of the scheme. This is confirmed by the AADT comparisons.
- Over the section of the B5242 Watkin Lane/Leyland Road corridor from the Watkin Lane Stagger through to the A59 Liverpool Road there is a general reduction in traffic flow as a result of implementing the scheme, this is most pronounced north of Bee Lane. On the section of the corridor from the A582 to Watkin Lane Stagger however traffic flows increase as a result of the scheme.
- The examination of journey times on the A582 corridor and the B5242 Watkin Lane/Leyland Road corridor show that between the A582/Watkins Lane junction and the A59 Liverpool Road, journey times are quicker on the A582 in all cases. The implementation of the scheme does however increase journey times on both corridors. On the A582 corridor the increases are marginal and are attributable to the addition of signal control at junctions which are not controlled in the DM. Along the B5242 Watkin Lane/Leyland Road corridor the increased journey time is a result of the conversion of the Bee Lane junction from roundabout to traffic signal control with the Pickering Farm Link Road in place.
- The overall percentage of HGV traffic remains reasonably unchanged from the DM to both DS scenarios.
- The closure of the proposed Pickering's Farm Link Road in Scenario 5 appears to negate some of the benefits that the scheme brings in reducing traffic on the northern section of Watkin Lane and Leyland Road. This is to be expected as the development traffic generated by

the Pickering Farm Development is confined to the B5242 Watkin Lane/Leyland Road corridor.

### **Junction Capacity**

12.7.39 Capacity assessments of each of the 17 junctions have been undertaken for the 5 scenarios, the location of the junctions is shown in Figure 12.17 below. The following sections set out a summary of the results of the standalone junction modelling for each of the scenarios. A full set of the junction modelling outputs are contained in Appendix 12.5 in Volume 3 of this ES.

Figure 12.17 Junction Locations



12.7.40 Turning Movement Counts (TMC) were collected in September or November (Broad Oak only) 2018 for each of the junctions. In order to determine the expected turning movements for the 2022 scenarios TEMPro growth rates were applied to the TMCs. The difference between the DM and 'Do Nothing' (DN) scenarios in the CLTM 2022 has been applied to the 2022 TMCs to determine the 2022 DM turning flows. The difference between the DS1 scenario and DM have also been obtained from the CLTM 2022 to determine the 2022 DS1 turning flows. The turning movements for the 2037 scenarios

have been taken directly from the CLTM 2037. These calculations are included in Appendix 12.3 in Volume 3 of this ES.

12.7.41 A value of 0.85 RFC for priority junctions and roundabouts, and 90% DoS for signalised junctions has been used as the threshold to determine if a junction is operating within acceptable levels for this assessment.

Opening Year (2022)

12.7.42 Table 12.10 show the 2022 junction assessment results for DM and DS1, respectively, showing the overall junction performance. Results are presented for morning and evening peak periods.

**Table 12.10 Model Results: Scenario 1 – DM 2022 and Scenario 2 – DS1 2022**

Junction			(% = Degree of Saturation) (0.XX = Ratio Flow to Capacity)			
			Scenario 1 DM (2022)		Scenario 2 DS1 (2022)	
No.	Name	Control Type	AM	PM	AM	PM
1	Broad Oak	Signalised Roundabout	65.5%	70.8%	65.5%	76.8%
2	Pope Lane	Signalised Crossroad	75.9%	69.4%	67.4%	71.9%
3	Pickering Farm Link	Signalised Junction	N/A	N/A	N/A	N/A
4	Chain House Lane	Signalised Crossroad	70.5%	66.7%	72.4%	86.0%
5	Penwortham Way / Flensburg Way	Signalised Roundabout	47.5%	49.3%	47.5%	54.7%
6	Flensburg Way / Longmeanygate	Roundabout	0.90	0.95	77.4%	83.5%
7	Longmeanygate / Golden Hill	Signalised Crossroad	80.8%	95.6%	87.0%	106.5%
8	A582 / HWRC	Priority Junction	0.02	0.21	0.00	0.08
9	Croston Rd West	Roundabout	0.74	1.01	64.0%	71.9%
10	Croston Rd East	Roundabout	1.17	1.27		
11	A582 / Sherdley Rd	Priority Junction	0.10	0.34	44.6%	55.4%
12	A582 / Watkin Lane	Signalised Roundabout	95.9%	95.9%	89.5%	104.7%
17	Stanifield Lane / Fowler Lane	Priority Junction	0.02	0.06	0.02	0.06
18	Watkin Lane Stagger	Signalised Staggered Junction	88.2%	89.9%	105.6%	113.8%
19	Oaks Wood Roundabout	Signalised Roundabout	75.3%	55.0%	73.9%	61.1%
20	Leyland Road / A59	Signalised Junction	61.1%	65.9%	56.9%	65.0%
21	Leyland Rd / Bee Ln / The Cawsey	Roundabout/Signalised Junction	1.45	1.21	84.4%	78.4%

12.7.43 In Scenario 1 DM (2022) there are six junctions which operate at or above acceptable levels of service in one or more peak periods, as shown in Table 12.10. Four are roundabouts, the Flensburg Way / Longmeanygate junction, the Croston Road East and West junctions and the Leyland Road / Bee Lane junction and two are signal controlled junctions, the Longmeanygate / Golden Hill which is over capacity in the evening peak and the A582/Watkin Lane signalised roundabout junction which is over capacity in both the morning and evening peak hours. All four of the roundabout junctions are converted to signalised junctions as a result of the scheme and in DS1 operate within capacity. With the scheme in place however the situation at the signalised junctions worsen, at the Longmeanygate/Golden Hill junction the degree of saturations goes up from 95.6% in DM to 106.5% in DS1. At the A582/Watkin Lane junction the situation in the evening peak goes from 95.9% to 104.7%. As a consequence of the scheme The Watkins Lane Stagger junction goes overcapacity.

Design Year (2037)

12.7.44 Table 12.11 shows the 2037 junction assessment results for DM and DS1, respectively, showing the overall junction performance. Results are presented for morning and evening peak periods.

**Table 12.11 Model Results: Scenario 3 – DM 2037 and Scenario 4 – DS1 2037**

Junction			(% = Degree of Saturation) (0.XX = Ratio Flow to Capacity)			
			Scenario 3 DM (2037)		Scenario 4 DS1 (2037)	
No.	Name	Control Type	AM	PM	AM	PM
1	Broad Oak	Signalised Roundabout	78.0%	79.1%	82.4%	86.9%
2	Pope Lane	Signalised Crossroad	83.9%	75.2%	78.6%	76.9%
3	Pickering Farm Link	Signalised Junction	58.3%	49.0%	63.2%	59.3%
4	Chain House Lane	Signalised Crossroad	78.7%	73.3%	83.1%	85.1%
5	Penwortham Way / Flensburg Way	Signalised Roundabout	55.1%	68.4%	55.7%	75.7%
6	Flensburg Way / Longmeanygate	Roundabout	1.15	1.03	84.9%	79.8%
7	Longmeanygate / Golden Hill	Signalised Crossroad	86.7%	103.7%	87.4%	83.0%
8	A582 / HWRC	Priority Junction	0.02	inf <sup>1</sup>	0.00	0.12
9	Croston Rd West	Roundabout	0.93	1.24	86.8%	85.6%
10	Croston Rd East	Roundabout	1.62	1.59		
11	A582 / Sherdley Rd	Priority Junction	Inf <sup>1</sup>	Inf <sup>1</sup>	68.8%	69.3%
12	A582 / Watkin Lane	Signalised Roundabout	97.1%	135.9%	103.2%	114.1%
17	Stanifield Lane / Fowler Lane	Priority Junction	0.20	0.78	0.22	0.73
18	Watkin Lane Stagger	Signalised Staggered Junction	77.9%	51.3%	85.8%	67.5%
19	Oaks Wood Roundabout	Signalised Roundabout	76.7%	87.5%	83.4%	86.8%
20	Leyland Road / A59	Signalised Junction	56.3%	85.1%	51.1%	83.3%
21	Leyland Rd / Bee Ln / The Cawsey	Roundabout/Signalised Junction	1.18	0.96	66.0%	68.1%

12.7.45 The same junctions that were overcapacity in 2022 DM are overcapacity in 2037, the only addition is the A582/Sherdley Road priority junction. As with the 2022 scenarios the conversion of the roundabouts to signal controlled junctions brought about by the scheme means that in DS1 these junctions operate within capacity. With the scheme in place the Longmeanygate/Golden Hill signalised junction operates within capacity. In DS1 and the degree of overcapacity at the A582/Watkin Lane junction is reduced, but the junction remains overcapacity. The overcapacity which occurs at the Watkin Lane Stagger junction in DS1 at 2022 does not occur in DS1 at 2037. The reason for this is likely to be as a result how the 202 and 2037 traffic flows have been derived, the 2022 traffic flows are based on observed traffic flows adjusted to reflect the reassignment identified in the SATURN model, whereas the 2037 traffic flows are taken directly from the SATURN model.

<sup>1</sup> There is an infinite RFC when no vehicles can make a movement from an arm in the model, effectively resulting in zero capacity for the arm with the given conditions.



Design Year (2037) DS1 – DS2 Comparison

12.7.46 Table 12.12 shows the 2037 junction assessment results for DS1 and DS2, respectively, showing the overall junction performance. Results are presented for morning and evening peak periods.

**Table 12.12 Model Results: Scenario 4 – DS1 2037 and Scenario 5 – DS2 2037**

Junction			(% = Degree of Saturation) (0.XX = Ratio Flow to Capacity)			
			Scenario 4 DS1 (2037)		Scenario 5 DS2 (2037)	
No.	Name	Control Type	AM	PM	AM	PM
1	Broad Oak	Signalised Roundabout	82.4%	86.9%	77.1%	78.0%
2	Pope Lane	Signalised Crossroad	78.6%	76.9%	83.5%	73.9%
3	Pickering Farm Link	Signalised Junction	63.2%	59.3%	66.6%	57.5%
4	Chain House Lane	Signalised Crossroad	83.1%	85.1%	83.3%	77.0%
5	Penwortham Way / Flensburg Way	Signalised Roundabout	55.7%	75.7%	54.9%	75.4%
6	Flensburg Way / Longmeanygate	Roundabout	84.9%	79.8%	82.7%	79.4%
7	Longmeanygate / Golden Hill	Signalised Crossroad	87.4%	83.0%	87.9%	84.3%
8	A582 / HWRC	Priority Junction	0.00	0.12	0.00	0.10
9	Croston Rd West	Roundabout	86.8%	85.6%	85.6%	86.2%
10	Croston Rd East	Roundabout				
11	A582 / Sherdley Rd	Priority Junction	68.8%	69.3%	68.2%	65.3%
12	A582 / Watkin Lane	Signalised Roundabout	103.2%	114.1%	100.3%	111.4%
17	Stanifield Lane / Fowler Lane	Priority Junction	0.20	0.78	68.2%	65.3%
18	Watkin Lane Stagger	Signalised Staggered Junction	85.8%	67.5%	73.2%	51.6%
19	Oaks Wood Roundabout	Signalised Roundabout	83.4%	86.8%	75.4%	88.1%
20	Leyland Road / A59	Signalised Junction	51.1%	83.3%	57.0%	84.7%
21	Leyland Rd / Bee Ln / The Cawsey	Roundabout/Signalised Junction	66.0%	68.1%	1.16	0.93

12.7.47 The comparison shows that there is little difference in junction performance between DS1 and DS2. The only junction where there is any significant difference is the Bee Lane junction and this arises from the fact that in DS1 where the junction is signalised, whereas in DS2, with the absence of Pickering Farm Link Road the junction remains as a roundabout.

## Summary of Operational Results

### Scheme Junctions

12.7.48 With regards to those junctions that make up the scheme, the junction modelling for the DM and DS1 show that for the junctions where the form of junction control is changing, the operational performance improves. This improvement in performance is realised in both the Opening Year (2022) and Design Year (2037) scenarios.

12.7.49 The DS2 Design Year (2037) assessment shows that closure of the link through Pickering's Farm that connects into the Bee Lane junction (junction 21) has a very minimal impact upon the overall performance of the scheme junctions, and those further afield. However, with the Bee Lane junction remaining as a roundabout, the junction is expected to operate above capacity in this scenario.

12.7.50 In all scenarios all junctions that make up the scheme operate below 90% Degree of Saturation (DoS).

### Study Area Junctions

12.7.51 Outside of the scheme study area the modelling has identified 3 of the 7 junctions are predicted to operate above the threshold in the Opening Year in the Scenario 1 (DM). As a result of opening the scheme one of these junctions, the Bee Lane junction, which is converted from a roundabout to signal control remains within capacity in Scenario 2 (DS1), the remaining 2 junctions, A582/Watkin Lane and Longmeanygate/Golden Hill are overcapacity in DS1. As a result of opening the scheme the Watkin Lane Stagger (Brownedge Road) junction on the B5242 Watkin Lane/Leyland Road corridor is overcapacity in Scenario 2 (DS1). Elsewhere the introduction of the scheme in the Opening Year (2022) results in very minor changes, positive and negative, in the DoS or RFC for those junctions within the study area.

12.7.52 In the Forecast Year, the same 3 junctions area shown to be operating with a DoS or RFC above the threshold in Scenario 3 (DM), although the number of junctions reduces to only 1 in Scenario 4 (DS1), the A582/Watkin Lane junction. Unlike in the Opening Year the Watkin Lane Stagger (Brownedge Road) junction on the B5242 Watkin Lane/Leyland Road corridor is not overcapacity in the Forecast Year, this is attributable to the method used to derive 2022 and 2037 traffic flows. Elsewhere the introduction of the scheme in the Forecast Year (2037) results in very minor changes, positive and negative, in the DoS or RFC for those junctions within the study area.

### **Collisions – COBA Assessment**

12.7.53 An analysis of the potential impact upon the rate of collisions has been undertaken for the DM and DS1 Design Year (2037).

12.7.54 The analysis compared forecast collision rates in the DM and DS1 scenarios, using forecast flows for the Design Year. The forecast flows were then factored based on a comparison of forecast 2017 rates compared to actual accidents in 2017 and are presented as accident rates per year.

12.7.55 This exercise has been undertaken for junctions (Table 12.13) and links (Table 12.14) using the Department for Transport's (DfT) COBA (COst Benefit Analysis) set out in the COBA Manual (2017).

**Table12.13 COBA Assessment Results – Junctions**

Junction	2017 COBA AR	AR x 5 yrs	Actual collisions 2013-2017	Baseline Comparison Factor	2037 DS Adjusted	2037 DM Adjusted
Golden Way Roundabout	1.13	5.65	5	0.88	2.83	4.09
Pope Lane	2.63	13.14	11	0.84	2.39	1.88
Chain House Lane Junction	2.81	14.03	12	0.86	2.52	1.95
Penwortham Way / Flensburg Way	2.12	10.62	13	1.22	3.82	5.38
Flensburg Way / Longmeanygate	1.69	8.44	10	1.18	3.93	1.77
Croston Road West	1.53	7.66	1	0.13	0.37	0.19
Croston Road East	1.46	7.29	8	1.10	5.48	2.66
Croston Road East	-	-	-	1.10	5.66	-
A582 / Watkin Lane	2.95	14.75	22	1.49	6.31	9.04

**Table12.14 COBA Assessment Results – Links**

Link Description	2017 COBA AR	COBA AR x 5	2017 Actual Existing AR	Baseline Comparison Factor	2037 DS Adjusted	2037 DM Adjusted
Golden Way: Broad Oak Roundabout to Pope Lane	0.24	1.19	1	0.84	0.01	0.01
Penwortham Way: Pope Lane to Chain House Lane	0.64	3.19	4	1.25	0.03	0.06
Penwortham Way: Chain House Lane to A582/Flensburg (Tank) Roundabout	0.59	2.96	4	1.35	0.01	0.03
Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Longmeanygate Roundabout	0.63	3.15	6	1.91	0.02	0.05
Flensburg Way: A582/Flensburg Way (Tank) Roundabout to Croston Road roundabouts	0.72	3.60	2	0.56	0.01	0.01
Farington Road: Croston Road roundabouts to Stanifield Lane Roundabout	0.81	4.03	4	0.99	0.03	0.07

12.7.56 The analysis forecasts a total of approximately 27 accidents per year at all the junctions on the network if the scheme is implemented, compared to a total of approximately 33 accidents per year if the scheme is not implemented. The junction which will see the highest reduction in accident rates in the DS1 is the Penwortham Way / Flensburg Way junction which is forecast to have an accident rate of 3.82 per year in the DS1, and 5.38 accidents per year in the DM.

12.7.57 The lengths of the links in the network are short, often under a kilometre long. Due to the method that COBA is calculated, some of the accidents that occur at links may be included in the junction analysis as other factors such as queue lengths are not taken into consideration. As such, fewer than 1 accidents per year forecast at all the links in the design year in both the DM and DS1. There is a total accident rate of 0.11 for all links on the network in the DS1, compared to a total accident rate of 0.22 for all links in the DM.

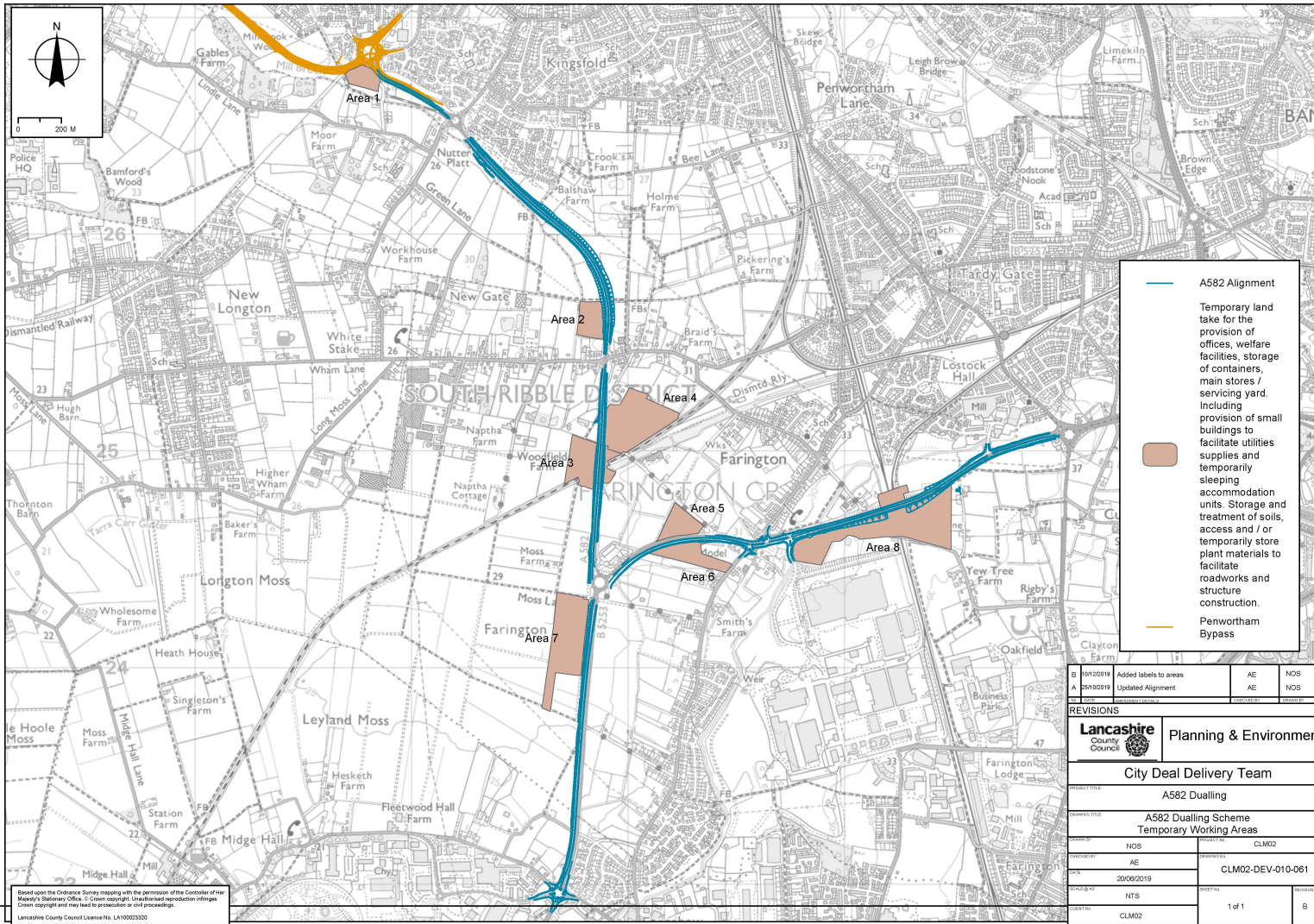
12.7.58 The outcome of this analysis is that the scheme is forecast to result in a reduction of collisions across the impact area when compared to the DM scenario.

## 12.8 Construction Impacts

- 12.8.1 It has been assumed that the scheme will be constructed in a single phase over a period of 27 months with construction scheduled to start in 2021, with the completed scheme open for traffic in 2023. The proposed working hours for the site will be 07.30 to 18.00 Monday to Friday and 08.00 to 13.00 on Saturdays. Working outside these hours would only be permitted for specific operations which cannot be undertaken at any other time without unacceptable health and safety risks.
- 12.8.2 Given the length of the scheme, some 6.5km, it will be necessary to operate a number of site compounds, the location of the compounds is shown in Drawing CLM02-DEV-010-053, reproduced as Figure 12.18. The compounds will provide a number of functions, storage of materials, storage of excavated materials, storage of all staff and plant vehicles as well as staff welfare facilities. All the compounds will have direct access to the A582 and so no temporary highway links will be required to gain access to the compounds other than the formation of proper junctions off the A582.



Figure 12.18 Construction Compounds

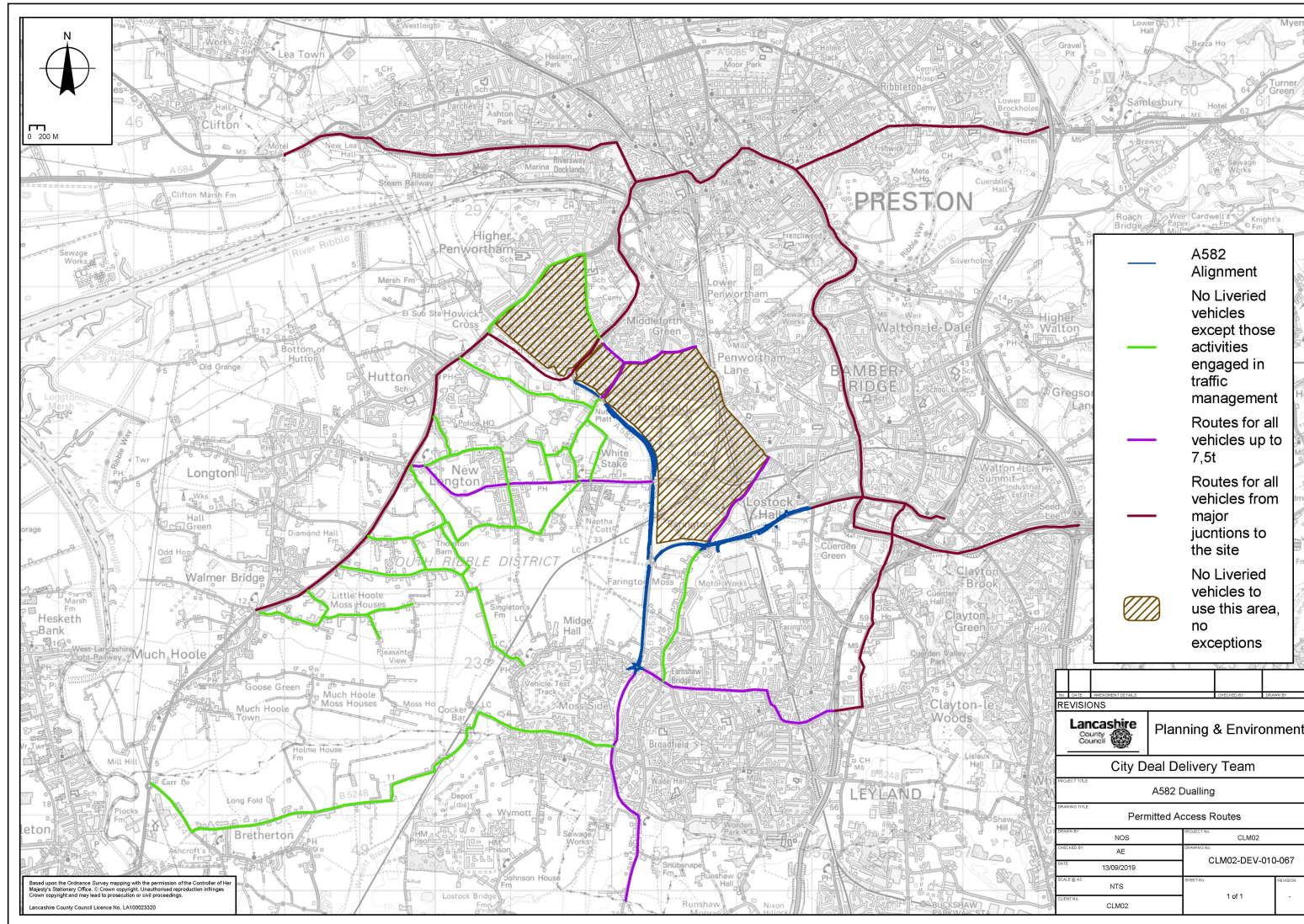


12.8.3 Vehicular movements associated with the compounds will vary over the course of the construction period. At this stage it is not possible to predict the number of vehicular movements associated with each compound as these will be determined by the construction programme adopted by the successful contractor. It is however not expected that there would be more than 30 vehicles per day at any one compound and that trips to and from the compounds would largely be outside of the traditional morning and evening peak hours.

12.8.4 Permitted access routes to and from the construction scheme along the A582 have been identified and are shown in Drawing CLM02-DEV-010-067, reproduced as Figure 12.19. The access routes have been selected to restrict traffic to the most appropriate routes and minimise the impacts on residents and the local communities. In addition to permitted routes Drawing CLM02-DEV-010-067 also shows areas where construction traffic of any form is not permitted, these areas include Tardy Gate, Kingsfold, Howick Cross and Higher Penwortham.



Figure 12.19 Permitted Access Routes



12.8.5 The primary access routes from the north, south and east are via M6 Junction 29 and then the A582 (Lostock Lane) for routes to the south and the east and M6 Junction 31 and then A59 (Brockholes Brow/Newhall Lane/Ringway/Marsh Lane/Guild Way) for routes from the north. The primary access routes from the west are via A59 (Liverpool Road/Penwortham By-Pass extension) and A583 (Blackpool Road/Riversway/Watery Lane) and then A5072 West Strand and A59 Guild Way. All the access routes are major routes in the urban road network and therefore impact are not expected to be significant.

12.8.6 During the works there will be temporary traffic management present along the A582, the level of traffic management and consequent reduction in carriageway capacity will vary over time as the works progress. It is not anticipated that the works will result in any road closures other than perhaps overnight closures if unimpeded access to the entire carriageway is required for a particular construction operation. Whilst there will be reduced road capacity as a result of constructions and there may be some diversion of traffic onto alternative routes. It is not considered that the impacts will be significant and will not be for the entire construction period.

#### Mitigation of the impacts of the construction works

12.8.7 Routes have been specifically selected to mitigate the impacts of the construction works on residents, by ensuring appropriate routes are used by all construction traffic.

12.8.8 To further mitigate the effects of construction related traffic on local communities and the environment, it is proposed that the following measures are also developed as part of engagement with the appointed contractor. These include:

- Deliveries of materials would be managed through the use of permitted access routes and abnormal load routes to minimise potential for local traffic congestion and to avoid residential areas;

- Where possible, avoid deliveries during the identified peak hours of 08.00-09.00 and 17.00-18.00;
- Wheel washing facilities and road sweepers will be utilised to maintain highway cleanliness;
- HGV monitoring to ensure drivers are following the prescribed permitted access routes;
- Temporary route signage to the site would be proposed and submitted to the local highway authority for review and to ensure compliance of the above; and,
- All staff vehicles would be parked within the construction site and its compounds, and not elsewhere.

12.8.9 More information will be provided within the Construction Environmental Management Plan, which is expected to be produced during the detailed design stage in agreement with the contractor and would be subject to management and monitoring throughout the construction period to ensure compliance.

## 12.9 Conclusions

### Introduction

12.9.1 This Transport Assessment (TA) has been prepared to support the planning application for the widening and dualling of the A582. The TA has been prepared in accordance with the guidance set out in Department for Transport (DfT) “*Guidance on Transport Assessments*” (2007) and in consultation with Lancashire County Council's Highway Development Service (LCC-HDS). The scheme would also include improvements to the following roundabouts.

### Summary of Transport Assessment

#### Link by Link Assessment

12.9.2 The CLTM that has been updated for different scenarios to undertake a comparative exercise of the change in traffic flows on links by link basis within the Study Area. The following are the main points that can be inferred from the link assessment for all 5 Scenarios:

- There is an overall increase in the volume of traffic using the A582 corridor because of the implementation of the scheme and is attributable to the increase in capacity along the route with the scheme in place;
- The two-way peak hour traffic flows on the B5254 Watkin Lane/Leyland Road corridor show that there is a general decrease in the volume of traffic using the corridor north of the Watkin Lane Stagger junction with the scheme in place;
- The examination of journey times on the A582 corridor and the B5242 Watkin Lane/Leyland Road corridor show that between the A582/Watkins Lane junction and the A59 Liverpool Road, journey times are quicker on the A582 in all cases;



- The overall percentage of HGV traffic remains reasonably unchanged with or without the scheme; and,
- The closure of the proposed Pickering's Farm Link Road in Scenario 5 appears to negate some of the benefits that the scheme brings in reducing traffic on the northern section of Watkin Lane and Leyland Road.

#### Proposed and Existing Scheme Junctions

12.9.3 The junction modelling for both the 'with' and the 'without' scenarios show that where the form of junction control is changed, the operational performance improves. This improvement in performance is realised in both the Opening Year (2022) and Design Year (2037) scenarios.

12.9.4 In all Scenarios, all of the junctions that make up the scheme operate below 90% Degree of Saturation (DoS).

#### Collisions – COBA Assessment

12.9.5 The analysis undertaken of the potential impact upon the rate of collisions in the Design Year (2037) with and without the scheme shows a forecast reduction of collisions across the impact area with the scheme in place.