A585 Windy Harbour to Skippool Improvement Scheme

TR010035

7.4 Transport Assessment

APFP Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
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Procedure) Regulations 2009

A585 Windy Harbour to Skippool Improvement Scheme
Development Consent Order 201[ ]

TRANSPORT ASSESSMENT

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1 EXECUTIVE SUMMARY

1.1 Overview

1.1.1 The A585(T) is located in the Lancashire County Council Local Authority and connects the settlements of Singleton, Skippool, Poulton-Le-Fylde, Thornton-Cleveleys and Hambleton along its route from the M55 junction 3 north-west of Preston into the northern part of the Fylde peninsula. Due to the lack of alternative routes and sustainable transport options, any incidents on this section of the A585 can also lead to significant delays, thereby exacerbating the situation.

1.1.2 The 4.5km section of the A585 between Windy Harbour junction and Skippool junction is a bottle-neck, affecting people's journeys between the M55 and the northern part of the Fylde peninsula as well as contributing to severance across the A585 between the Little Singleton and Skippool junctions.

1.1.3 Highways England is proposing an improvement to the A585 corridor west of the Windy Harbour junction.

1.1.4 This A585 Windy Harbour to Skippool Improvement Scheme Transport Assessment demonstrates that the Scheme planning application is supported by a local transport model which was developed in accordance with the Department for Transport's (DfT) web-based Transport Analysis Guidance (TAG). Traffic forecasts prepared using the Scheme's transport model were used to support the Scheme's highway design, environmental, operational and economic assessment. In addition, the Scheme's transport model was used to assess the impact of the proposed development on safety using the methodology outlined in the DfT guidance.

1.2 Scheme Description

1.2.1 The A585 Windy Harbour to Skippool Improvement Scheme ("the Scheme") is a 4.85km (3 miles) long dual 2-lane carriageway bypass from Windy Harbour Junction to the Skippool Junction.

1.3 Conclusions

1.3.1 The existing A585 traffic flow, which is in excess of the recommended flow range of a single lane carriageway, causes congestion issues on the road network, particularly in peak periods. The congestion leads to unreliable journey times and safety impacts in the villages of Little Singleton and Skippool and surrounding areas.

1.3.2 An overall Scheme objective, to improve safety along the route, will be achieved, as the Scheme if implemented is shown to reduce the number of accidents and casualties.

1.3.3 The Scheme reduces severance for non-motorised users. The reduced traffic flow on the de-trunked section due to the Scheme has the potential to improve the local environment along the de-trunked section and should encourage walking and cycling.

1.3.4 The Scheme benefits the long-distance traffic that uses the strategic roads of the A585 and M55 to travel between the authorities of Wyre, Fylde and Blackpool and the rest of the UK.

1.3.5 The Scheme improves road user journey time and reliability. Travel time savings of between 2 and 4.5 minutes per journey are forecast to be saved by road users due to the Scheme. The Scheme's Wider Economic Impacts due to improved journey times and reliability for business road users supports economic growth in the area.

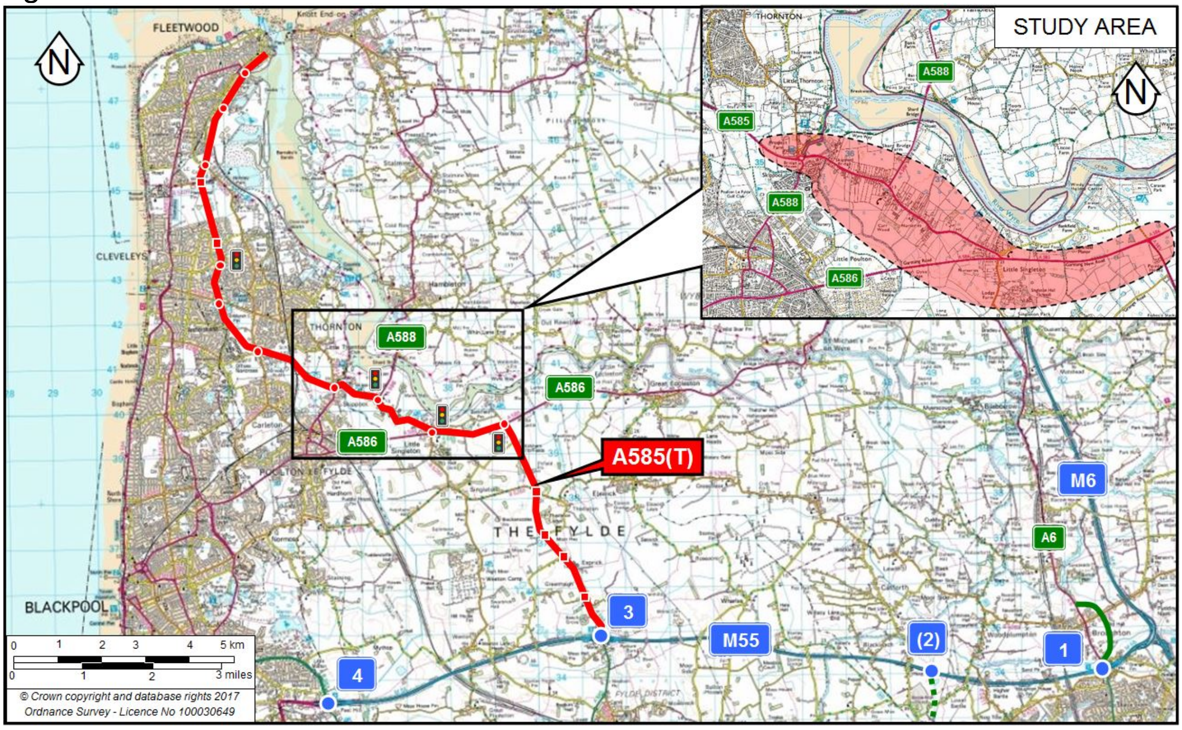
1.3.6 The Scheme includes future provision for traffic growth in the area. The A585 mainline traffic flows is not forecast to reach capacity by the design year 2037 showing that the Scheme mainline has reserve capacity to support future development in the area.

2 INTRODUCTION

2.1 Background

2.1.1 The A585(T) is a single carriageway trunk road, which provides the only viable access from the motorway network into Fleetwood and its urban areas. As a result, it suffers from congestion, especially during the peak periods. Figure 2-1 shows the location and the network in the vicinity of the trunk road.

Figure 2-1: Location and network near the A585



2.1.2 The lack of rail infrastructure means that the Strategic Road Network (SRN) is the only real access option to / from Fleetwood. Bus companies are also discouraged from providing alternative sustainable travel options as the congestion impacts on their ability to deliver reliable timetables. Due to the lack of alternative routes and sustainable transport options, any incidents on this section of the A585 can also lead to significant delays, thereby exacerbating the situation.

2.1.3 Parts of the Fleetwood conurbation suffer from high unemployment and deprivation and this continued congestion will significantly limit the housing and employment growth aspirations and opportunities of the local planning authorities at both Wyre Council and Fylde Council. Developers can be discouraged from investing due to the limited and congested access options.

2.2 Existing Road Network

2.2.1 The A585(T) is located in the Lancashire County Council Local Authority and connects the settlements of Singleton, Skippool, Poulton-Le-Fylde, Thornton-Cleveleys and Hambleton along its route from the M55 junction 3 north-west of Preston into the northern part of the Fylde peninsula.

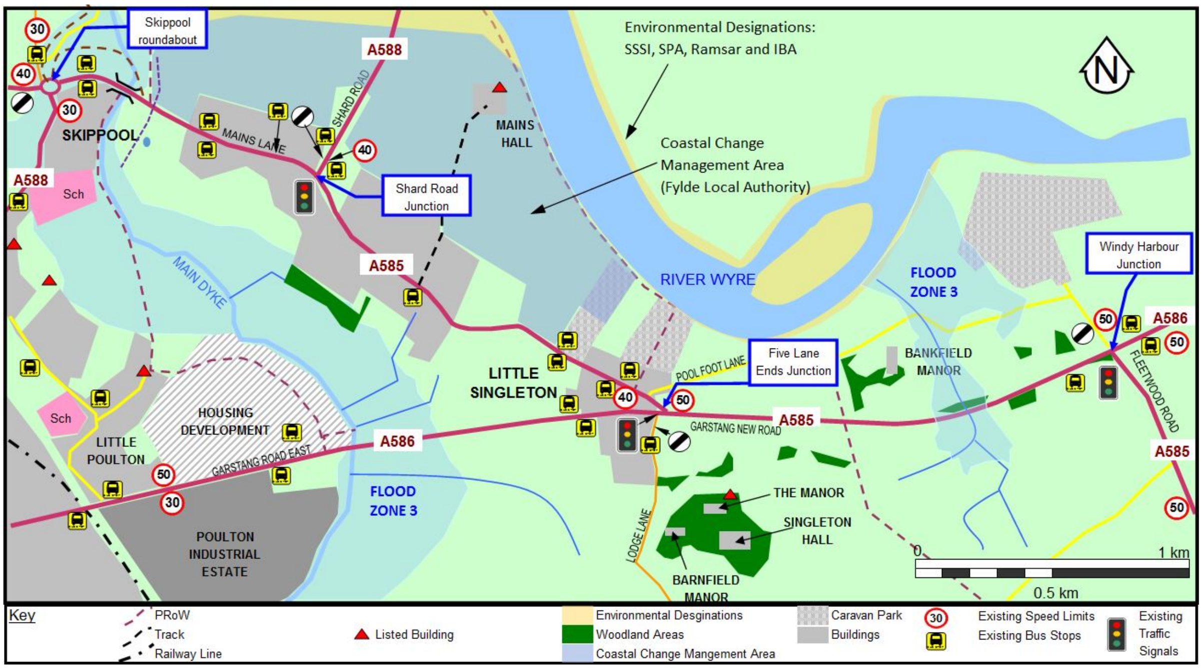
2.2.2 The 4.5km section of the A585 between Windy Harbour junction and Skippool junction is a bottle-neck, affecting people's journeys between the M55 and the northern part of the Fylde peninsula as well as contributing to severance across the A585 between the

Little Singleton and Skippool junctions.

2.2.3 The existing road layout is shown in Figure 2-2. Congestion is observed at the A585/A586 signalised junction (Little Singleton) and the signalised A585/A588 junction (Shard Road). A third signalised junction to the east (Windy Harbour) creates additional congestion, and the interaction of the three junctions exacerbates the issues. The two-way flows along the existing A585 route is up to 30,000 vehicles per day along the sections of interest (Source: 2017 two-way Annual Average Daily Traffic (AADT), Highways England Transport Information System (TRIS) data, A585 Mains Lane, East of Skippool Road). The recommended two-way AADT flow range of a single carriageway standard road is up to 26,000 vehicles per day (DMRB Volume 5, Section 1 Part 3 TA 46/97, Table 2.1 Opening Year Economic Flow Ranges, p2/1). The two-way A585 traffic flow, which is in excess of the recommended flow range of a single lane carriageway, causes congestion issues, particularly in peak periods. The congestion leads to unreliable journey times and safety impacts in the villages of Little Singleton and Skippool and surrounding areas.

2.2.4 In addition, traffic diverting onto less suitable local roads to avoid congestion at junctions remains an issue, with local communities away from the A585 route suffering in terms of poorer road safety, noise, air quality and severance.

Figure 2-2: A585 Windy Harbour to Skippool Improvement Scheme existing road layout

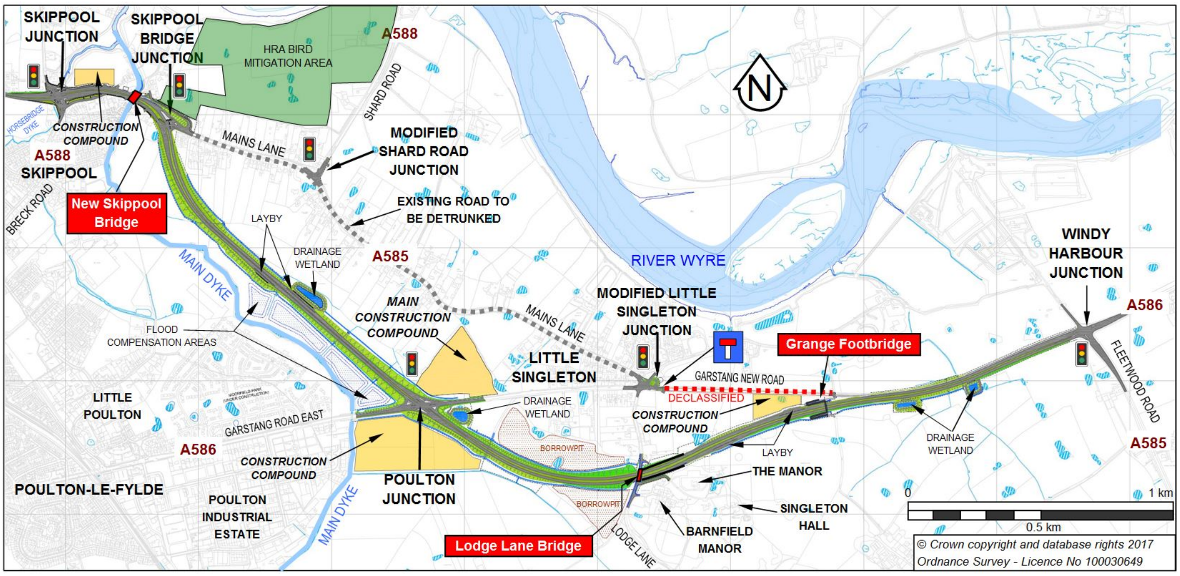


2.2.5 In spring 2015, a junction improvement ('pinch point scheme') was implemented at the Windy Harbour Junction (A585/A586) crossroads at Garstang New Road, Fleetwood Road and Windy Harbour Road. The existing crossroads were realigned and widened to provide additional lanes through the junction particularly for turning traffic along the A585 route and improvements to pedestrian and cycle facilities were made.

2.3 Scheme Description

2.3.1 Highways England is now proposing further improvements to the A585 corridor west of the Windy Harbour junction as shown in Figure 2-3.

Figure 2-3: A585 Windy Harbour to Skippool Improvement Scheme preferred route



2.3.2 The A585 Windy Harbour to Skippool Improvement Scheme ("the Scheme") is a 4.85km (3 miles) long dual 2-lane carriageway bypass from Windy Harbour Junction to the Skippool Junction. The Scheme includes:

- Four new junctions including: conversion of Skippool Junction to a traffic signal-controlled crossroads with A588 Breck Road and B5412 Skippool Road; Skippool Bridge Junction in the form of a three-arm traffic signal-controlled junction with the existing Mains Lane; Poulton Junction in the form of a signal-controlled crossroads connecting the new bypass to A586 Garstang Road East and modification to Little Singleton Junction (also known as Five Lane Ends) to accommodate U-turning traffic including buses. Between Skippool Bridge Junction and Poulton Junction the bypass is on embankment. East of Poulton Junction through to east of Lodge Lane the bypass is mostly in cutting.
- Three new major structures including: replacement of Skippool Bridge; Lodge Lane Bridge and Grange Footbridge.
- Alterations to the existing road network on completion of the bypass include: de-trunking the A585 between Skippool Bridge Junction and the end of Garstang New Road east of Little Singleton; applying a reduction in speed limit to 30mph and providing a combined footway/cycleway along Mains Lane between Shard Road Junction and Little Singleton; altering Garstang New Road east of Little Singleton to allow restricted access to farmers' fields and provide a shared footway/cycleway route between Windy Harbour Junction and Little Singleton; applying a reduced speed limit of 30mph along Garstang Road East between the proposed Poulton Junction and Little Singleton and upgrading the lighting along Mains Lane and Garstang Road East.

2.3.3 The Scheme reduces severance for non-motorised users inlcuding walkers, cyclists and horse riders and improves access across the existing A585 between the Little Singleton and Skippool junctions. Previously there were no controlled crossing points along the A585 between Skippool and Little Singleton junctions. Signalised pedestrian crossings have been introduced at Skippool, Shard Road and Little Singleton junctions. In addition, the footpaths will be improved and a combined footway and cycleway will be implemented. The routes for pedestrians and cyclists will follow the existing road network rather than the bypass as this provides direct links between communities along routes with lower traffic flows. The reduced traffic flow on the de-trunked section due to the Scheme has the potential to improve the local environment along the de-trunked section and should encourage walking and cycling.

2.3.4 The A585 Windy Harbour to Skippool Improvement Scheme is shown on the General Arrangement Drawings (document reference TR010035/APP/2.5).

2.3.5 As a result of traffic growth forecast between the base year and design year, the Norcross roundabout and surrounding area is predicted to become severely congested, with and without the proposed Windy Harbour to Skippool Improvement Scheme. The improved throughput of traffic westbound from Skippool junction to Norcross junction as a result of the Scheme could exacerbate this issue. Furthermore, the congestion in the Norcross area limits the throughput of traffic eastbound towards the Scheme area.

2.3.6 Options for improving the operation of the Norcross junction are currently being considered independent of the A585 Windy Harbour to Skippool Improvement Scheme assessment, and therefore the Scheme design, environmental, operational and economic assessment assumes no scheme at the A585 Norcross junction (the adjacent Operations Directorate scheme) is in place in the opening year or design year of the A585 Windy Harbour to Skippool Improvement Scheme. Inclusion of the A585 Norcross scheme would require a separate sensitivity test to determine its impact on the A585 Windy Harbour to Skippool Improvement Scheme as the traffic flows approaching the Scheme are constrained by the existing capacity of the upstream A585 Norcross junction. A sensitivity test would address an otherwise possible limitation of the current Scheme appraisal in terms of assessing the chosen Scheme’s resilience to improved throughput of eastbound traffic as a result of any A585 Norcross improvement scheme.

2.4 Policy Context

2.4.1 The Tranche 3 Pinch Point traffic signal-controlled junction improvement at Windy Harbour Junction completed in Spring 2015 increased the number of lanes turning between Fleetwood Road and Garstang New Road, resulted in reduced queuing, and provided enhanced pedestrian and cycle facilities. However, in isolation, this provided limited benefit to the route as a whole.

2.4.2 The local highway authority at Lancashire County Council (LCC) has a long-held ambition to provide a route known as the M55 to Norcross Link (The Blue Route) to the west of the two junction constraints on the A585 (Little Singleton and Shard). The M55 to Norcross Link route is currently protected for planning purposes as shown in Figure 2-4. However, they now consider that the southerly section of this route between the M55 and the A586 is not economically viable and they wish to remove it from their programme although they are not currently proposing to rescind protection of that route, retaining just that element that would bypass the A585 Little Singleton and Shard Road junctions.

2.4.3 The section of the LCC route between Skippool and the A586 Garstang Road East is similar to the alignment of that section of the proposed Scheme.

2.4.4 Both offline and online options between Windy Harbour junction and Skippool were previously investigated by Highways England and after undertaking studies and modelling work on those options it was announced in October 2017 that the preferred option for this Scheme was a southern bypass.

Figure 2-4: M55-Norcross link road, safeguarded route

[1]

[1] Extract from Lancashire County Council's "Fylde Coast, Highways and Transport Masterplan" (July 2015)

2.5 Report Structure

2.5.1 This report has been prepared with the following structure:

- Chapter 1 - Introduction
- Chapter 2 – Baseline data and model development
- Chapter 3 – Current network performance
- Chapter 4 – Future network performance
- Chapter 5 – Road safety
- Chapter 6 – Summary and Conclusions
- Glossary

3 BASELINE DATA AND MODEL DEVELOPMENT

3.1 Introduction

3.1.1 In order to support the development of the A585 Windy Harbour to Skippool Improvement Scheme transport model, other previously developed transport models and data collected by Local Authorities was used in the development of the Scheme transport model.

3.1.2 In addition, a large set of traffic data was collected.

3.1.3 The Scheme base year transport model, traffic forecasts and economic assessment have been prepared guided by the Department for Transport's (DfT) web-based Transport Analysis Guidance (TAG).

3.1.4 The Scheme transport model is comprised of the following sub-components:

- A Simulation and Assignment of Traffic on Urban Road Network (SATURN) based highway network assignment model to replicate the base and forecast the future year travel demand and conditions on the highway network
- A Dynamic Integrated Assignment and Demand Modelling (DIADEM) based Variable Demand Model (VDM), to forecast user responses to changing travel conditions.

3.2 Baseline Data Sources

Previous transport models, road side interview (RSI) and survey data

3.2.1 Table 3-1 provides a summary of the previously developed transport models and previously collected Road Side Interviews (RSIs) and traffic survey data used in the development of the Scheme base year transport model.

Table 3-1: Summary of previous transport models and data

Previous Transport Models		Year Developed	Use in Transport Model Development
1.	A585 Corridor & Thornton-Fleetwood Area Action Plan S-Paramics Model	2010	S-Paramics model zone boundaries were reviewed whilst developing the Scheme SATURN model zone boundaries
2.	Further S-Paramics Modelling (PCF 1)	Originally in 2010, later adjusted to 2014 base using TEMPRO	
3.	Blackpool Transport Model (CUBE)	2008	Signal timings were reviewed to determine if they could be used at any of the signalised junctions in the Scheme SATURN model.
4.	Central Lancashire Highways & Transport	2014	Counts collected during 2014 at a number of RSI sites in the vicinity of Preston were used as a contribution to the

Previous Transport Models		Year Developed	Use in Transport Model Development
	Masterplan (CLHTM) – Preston Western Distributor (PWD)		development of the base year matrices for the Scheme SATURN model.
Previously Collected Traffic Data		**Year Collected**	**Use in Transport Model Development**
1.	Blackpool RSIs	2008	Used to develop the base year matrices for the Scheme SATURN model, after being uplifted to June 2015. The distributions of the trips recorded in these data sets were also used to generate distributions of generalised costs, which were used as inputs to the gravity model that was used in the synthesis of the prior matrix.
2.	A585 & Surroundings RSIs (collected by ANSA Consultants)	2010	
3.	RSIs collected for CLHTM (PWD)	2014	
4.	Blackpool Council – Temporary Automatic Traffic Counts (ATCs)	2012-2015	Used to derive factored counts for calibration/validation at screenlines and cordons
5.	Blackpool Council – Permanent ATCs	2012-2015	
6.	Lancashire County Council – Temporary ATCs	2011-2015	
7.	Lancashire County Council – Permanent ATCs	2011-2015	

3.2.1 The Blackpool, ANSA and PWD RSI trip data was used to build the A585 base year demand matrices. Figure 3-1 shows the location of the Blackpool (2008), A585, and Surroundings (ANSA 2010) RSI site locations. Figure 3-2 shows the RSI sites at which interviews were carried out for the development of the PWD model (2014).

3.2.2 The data age of the RSIs used to create the matrix for the A585 Windy Harbour to Skippool Improvement Scheme is as follows:

- Blackpool RSIs - May/June 2008
- ANSA Consultants RSIs - May 2010
- Preston Western Distributor RSIs - April 2014

3.2.3 Both the ANSA and Blackpool RSIs are beyond the 6 year guidance criteria provided by DfT TAG. As stated in TAG M3-1 Section 8 Paragraph 8.1.1, trip matrices should not be taken from existing model unless the following conditions are met:

- The trips having both ends in the Fully Modelled Area which were derived from survey data were based on survey data which are less than six years old.

3.2.4 Despite the limitation of the data it was decided by Highways England to continue using a model with the data available RSI data from 2008 and 2010. The reason for this was:

- Given the location of the Scheme Highways England took the view that the pattern of origin/destinations would not change significantly between 2008 and 2018 as for example, the alternative routes towards Fleetwood/Cleveleys are constrained by the River Wyre.
- Road schemes constructed in the vicinity of the A585 between 2008 and 2018 were deemed unlikely to have changed trip patterns.

3.2.5 It is also important to note that although the matrix is based on old RSI data, 2015/2016 ATC data has been used to create a 2015 base year model.

Figure 3-1: Blackpool and A585 & Surroundings (ANSA) RSI Site Locations.

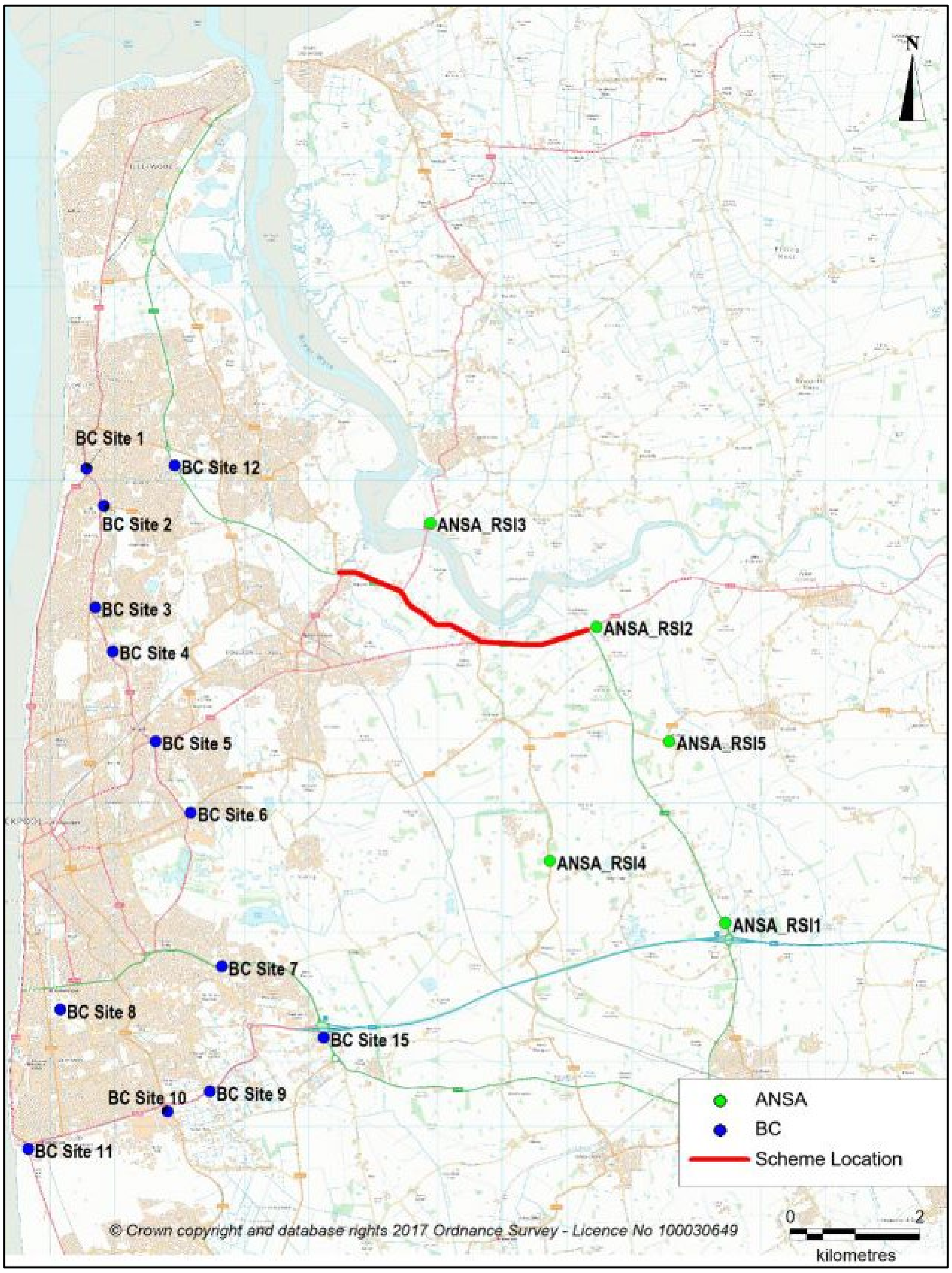
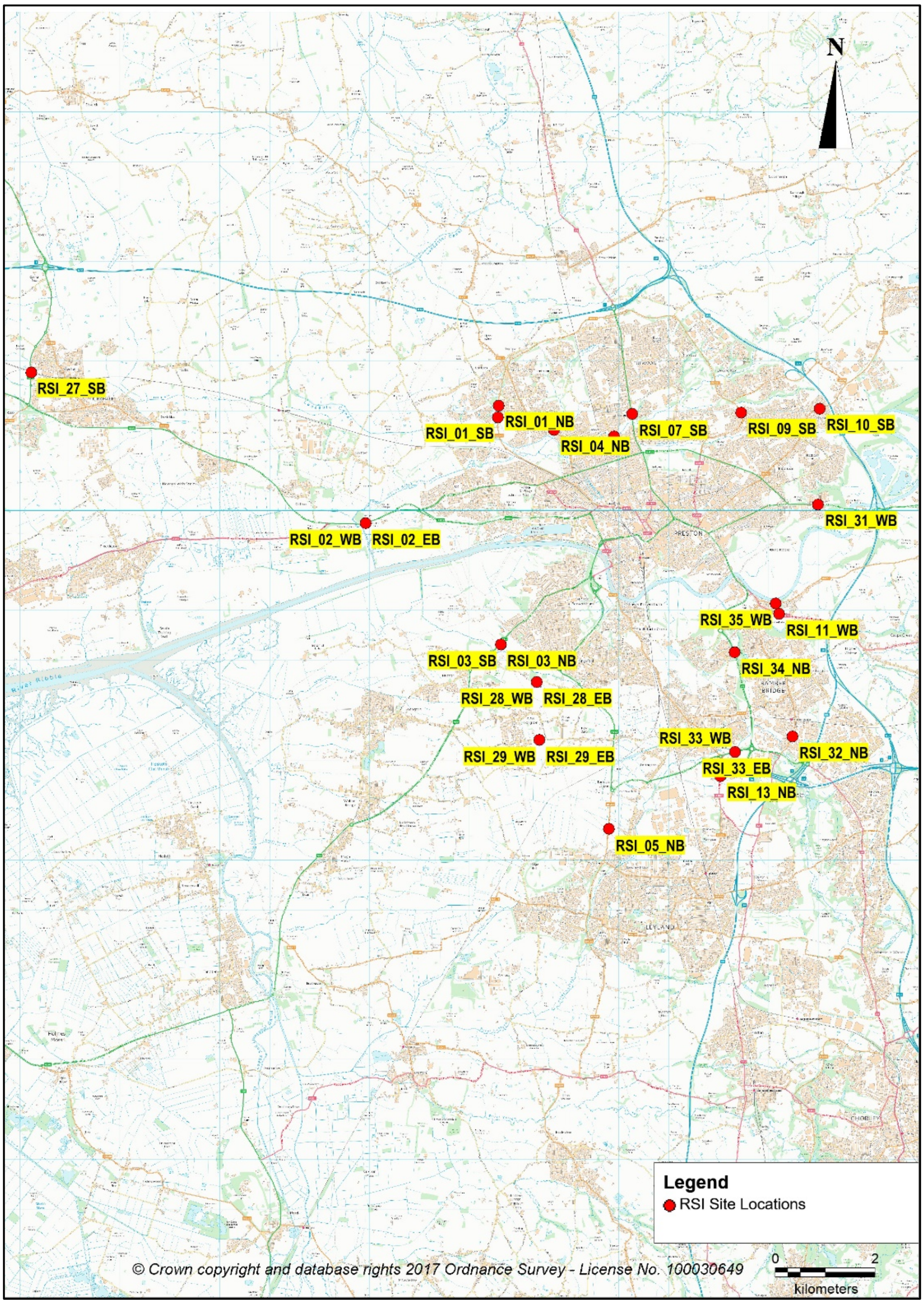


Figure 3-2: Preston Western Distributor RSI Site Locations



Traffic surveys & TRIS data

3.2.6 It was necessary to collect additional data at specific locations for calibration and validation purposes. To supplement the previously collected data and information taken from previously developed transport models, a programme of traffic surveys was carried out in September/October 2015 and February/March 2016, as summarised in Table 3-2.

Table 3-2: Scheme Traffic Survey Programme

Survey Type	No. of sites	Duration	Survey Dates	Use in model development
Automatic Traffic Counts (ATCs)	8	2 weeks (24 hours per day)	July, September, October 2015	Matrix development Link calibration and validation along screenlines and cordons
	56	2 weeks (24 hours per day)	February/March 2016	
Classified Junction Counts (CJCs)	64	2 days per site (07:00-19:00 on each day)	July 2015	Turn calibration and validation
Queue Length Surveys	64	2 days per site (07:00-19:00 on each day)	July 2015	Network calibration and validation
Manual Classified Counts (MCCs)	9	1 day (07:00-19:00)	February 2016	Calibration and validation Vehicle classification factors

3.2.7 Figure 3-3 to Figure 3-6 shows the location of the ATC (2015 and 2016), CJC and MCC site locations.

3.2.8 In addition to collecting bespoke traffic data to use in the development of the A585 model, existing traffic count information was extracted from Highways England's TRIS website (http://tris.highwaysengland.co.uk) for the months of July 2015 and September 2015.

3.2.9 The TRIS data was used as observed counts at selected screenlines and cordons and it was also used to identify Yearly Growth Factors (YGFs) and Monthly Seasonality Factors (MSFs) for sites on motorways and 'A' class roads that were then used to convert the data collected to the model base month and year of June 2015.

3.2.10 Figure 3-7 shows the TRIS data site locations.

Figure 3-3: 2015 Automatic Traffic Count Site Locations

Figure 3-4: 2016 Automatic Traffic Count Site Locations

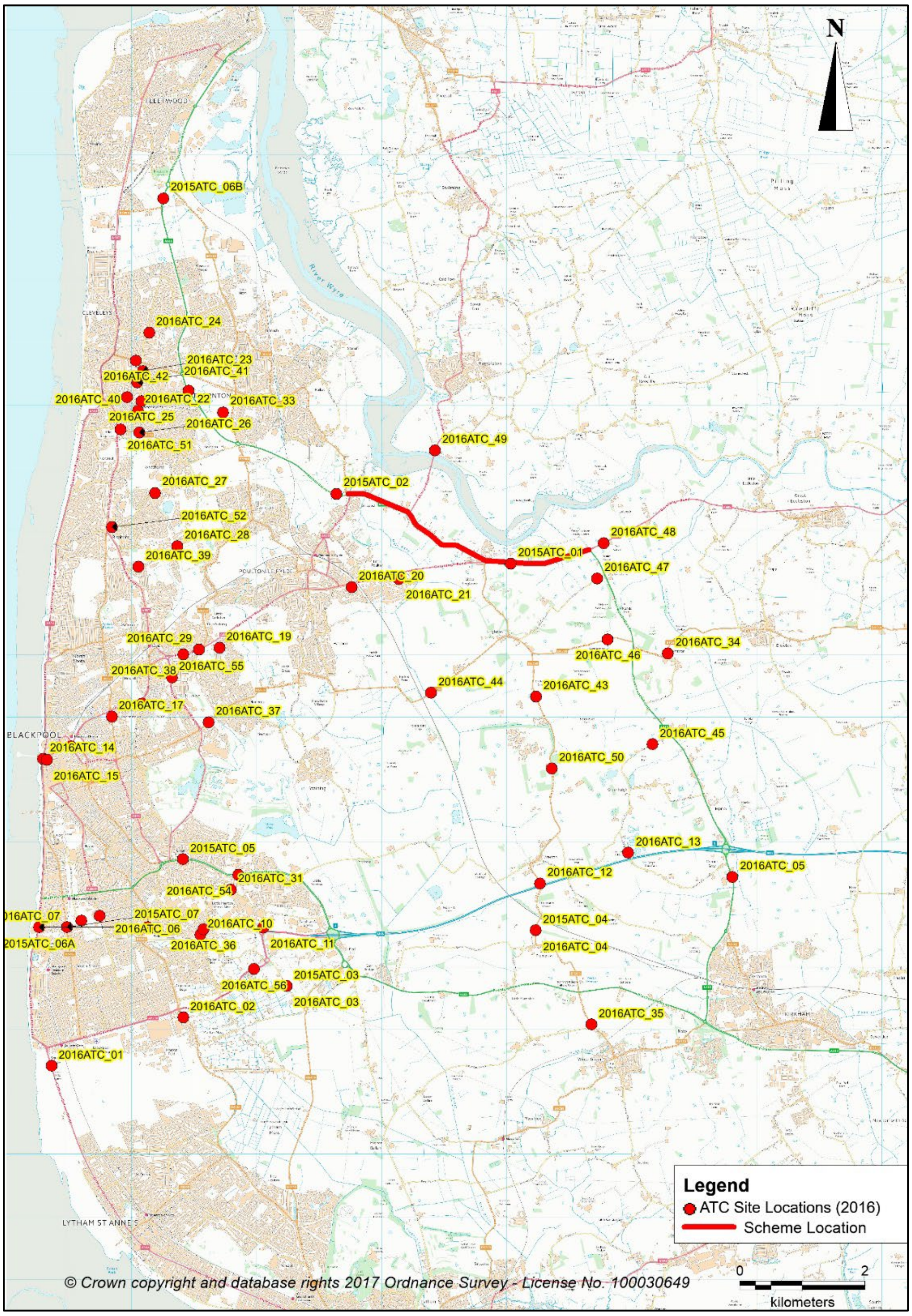


Figure 3-5: Classified Junction Count Site Locations

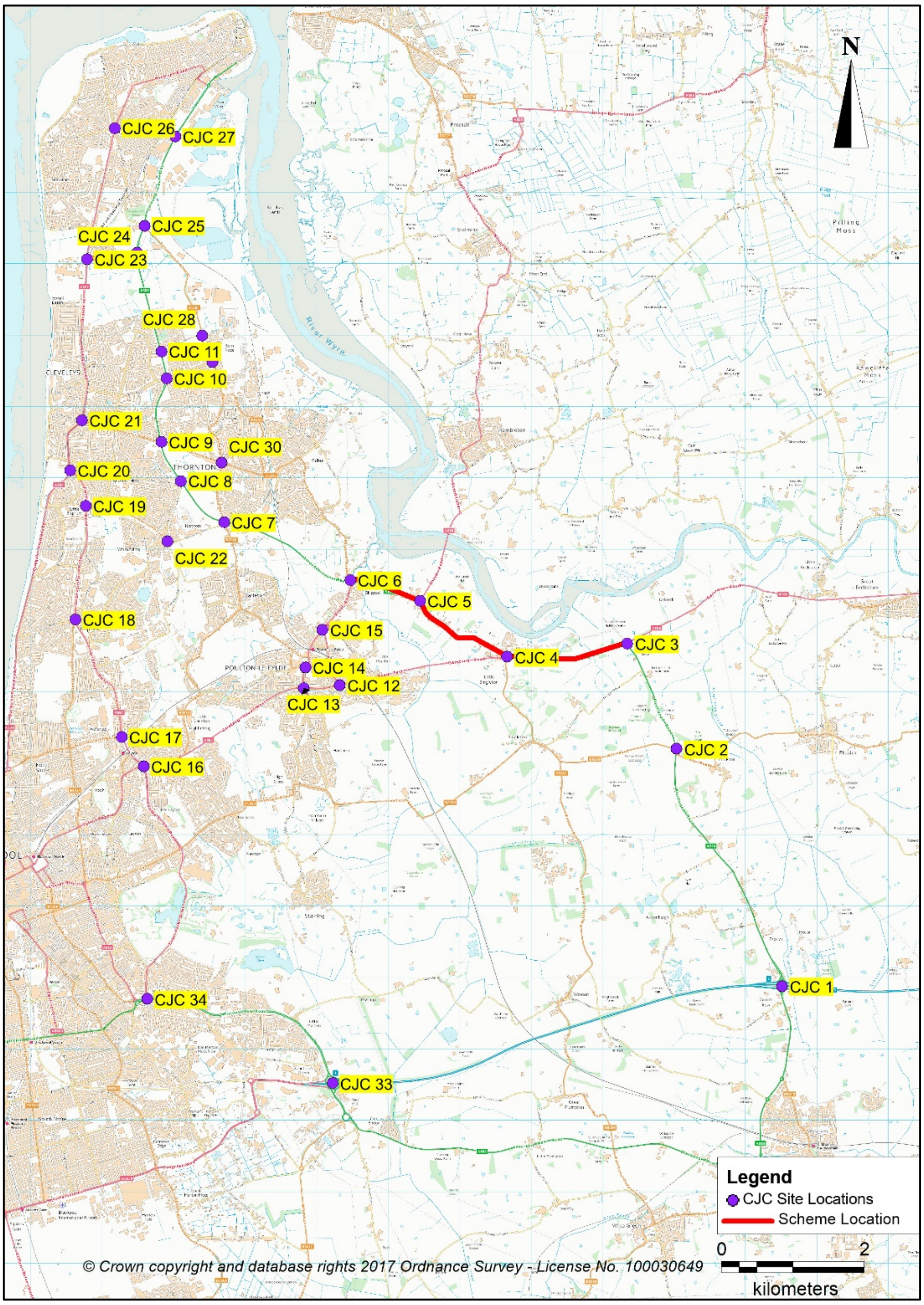
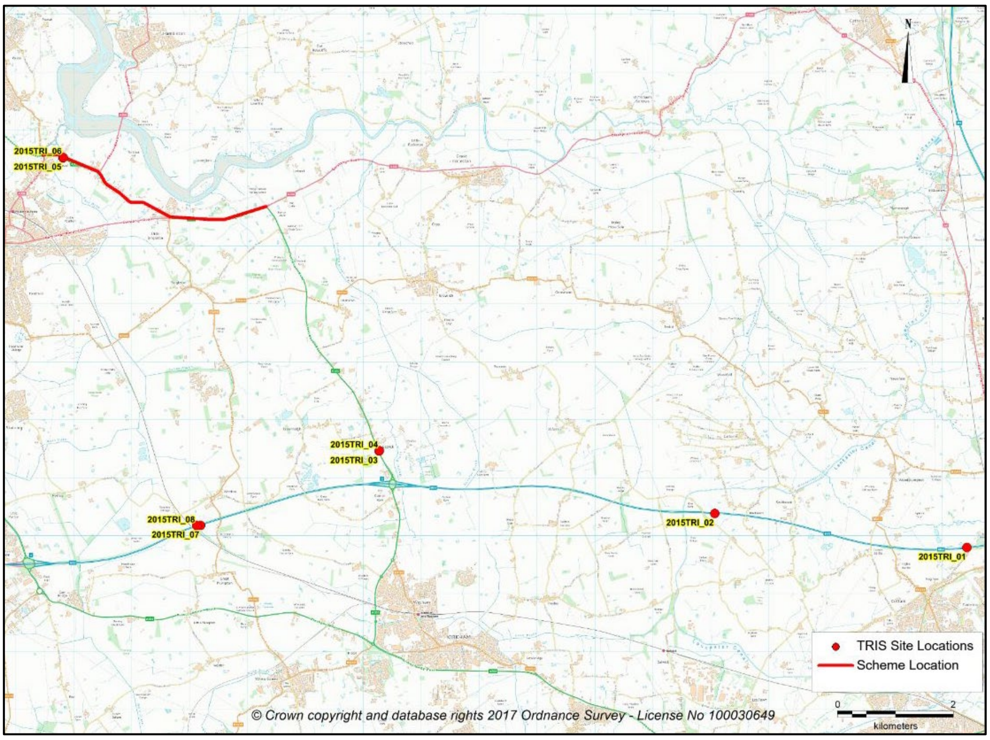


Figure 3-6: 2016 Manual Classified Count Site Locations

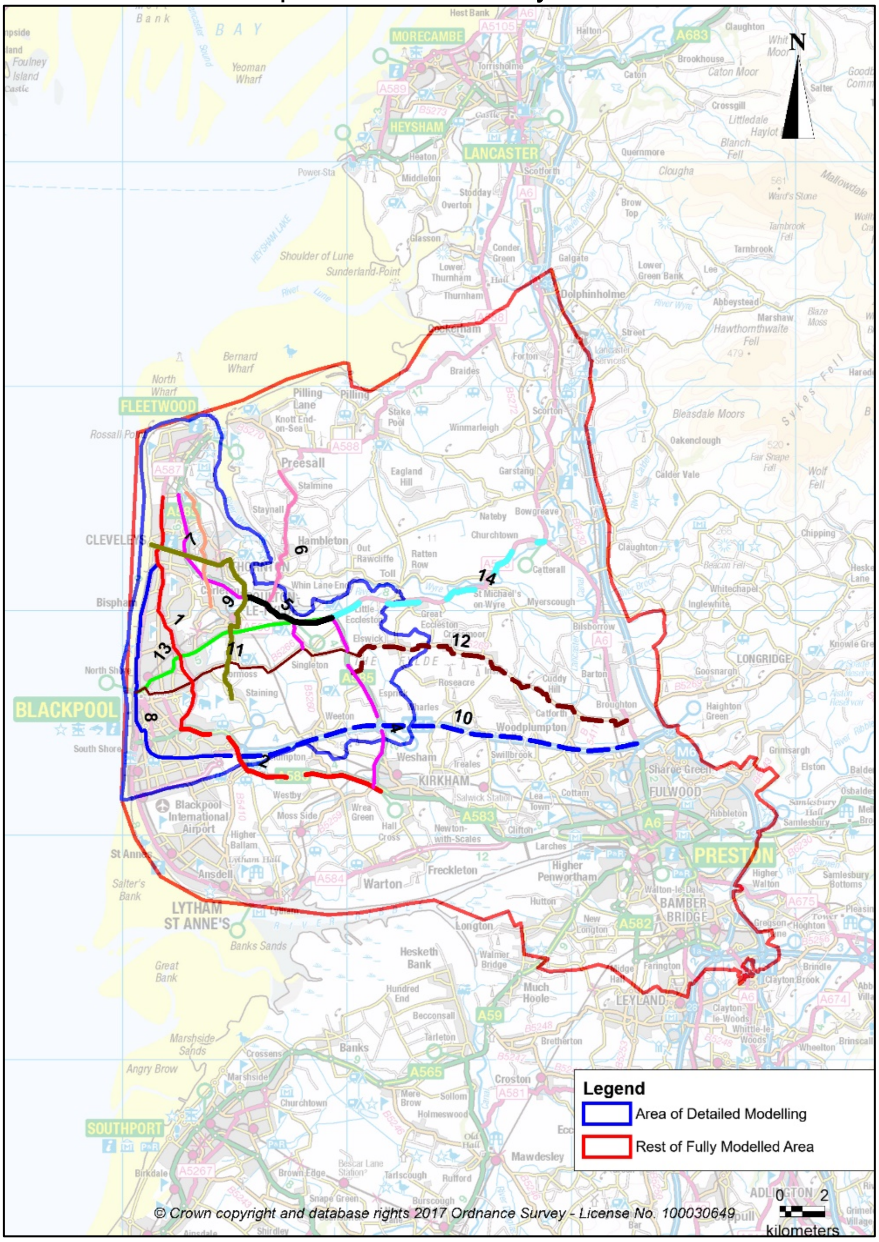
Figure 3-7: TRIS Site Locations



Journey time data

3.2.11 Data on observed journey times was extracted from the Trafficmaster database for 14 routes in the Scheme area as shown in Figure 3-8. This data was compared with modelled journey time data to identify whether the journey time validation results meet the relevant criteria.

Figure 3-8: Scheme Transport Model Journey Time Routes



3.3 Transport Modelling and Model Development Area

3.3.1 The Scheme transport model consists of two key model areas: The Fully Modelled Area (FMA) and the External Area.

3.3.2 The FMA is the area over which the proposed Scheme is expected to have an influence, focusing on the A585 to the north of the M55 and to the west of the M6, including the principal settlements of Fleetwood, Blackpool, Cleveleys, Poulton-Le-Fylde, Singleton and a number of smaller areas.

3.3.3 The FMA is further sub-divided into the Model Simulation Area or Area of Detailed Modelling (hereafter referred to as the ADM) and the Buffer Area.

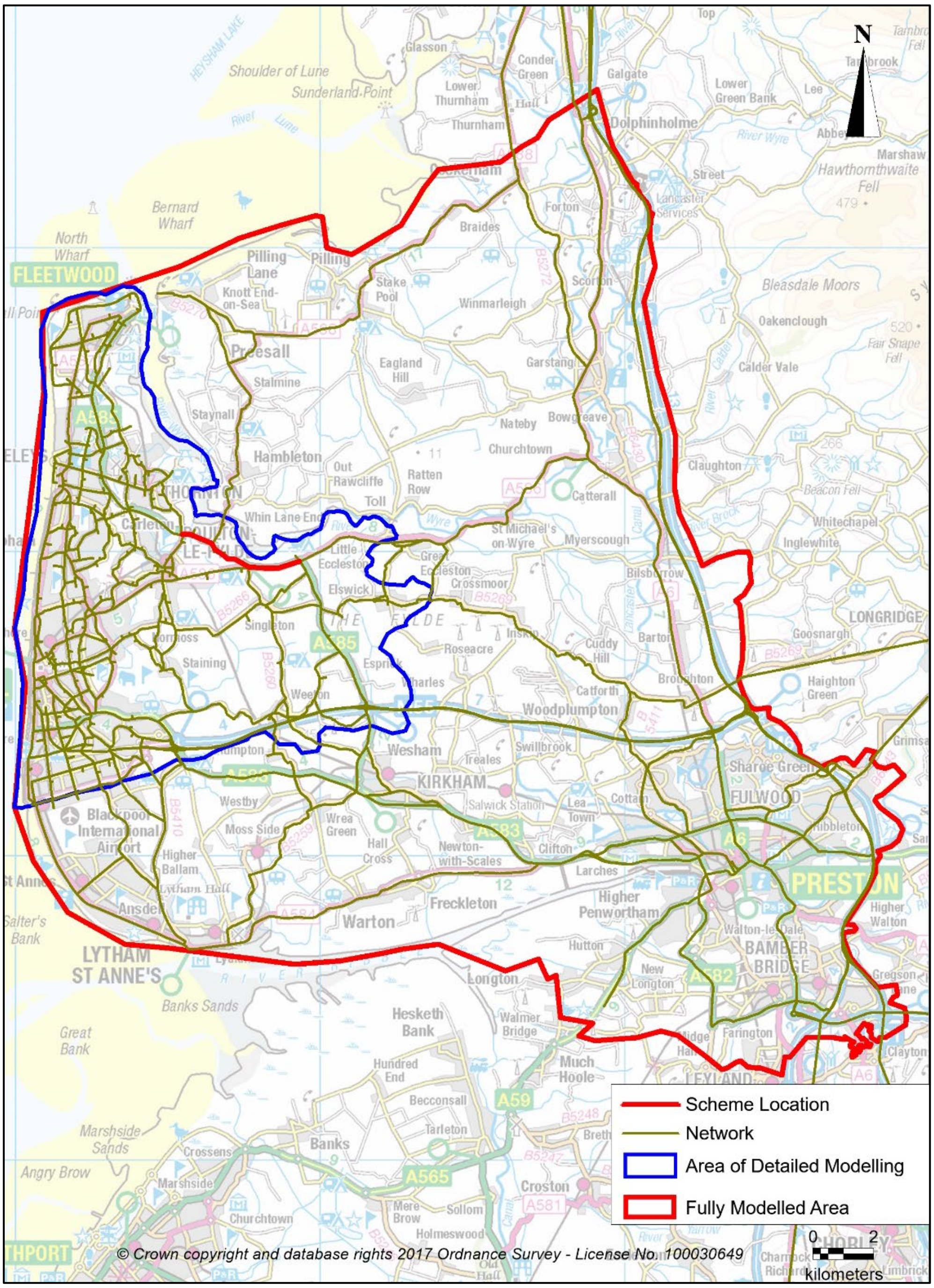
3.3.4 The ADM is the area over which Scheme impacts are expected. This area is characterised by small zones and network and junction modelling, with all trip movements represented.

3.3.5 The Buffer Area is the area over which Scheme impacts are expected to be relatively weak in magnitude. Trip movements are represented in the Buffer Area of the A585 base year model with larger zones and less network detail than for the ADM.

3.3.6 The External Area is the area outside the anticipated area of Scheme influence, characterised in the Scheme transport model by large zones, skeleton networks and fixed speed modelling. The External Area represents a large proportion of the rest of Great Britain

3.3.7 The Scheme transport model road network in the Scheme area is shown in Figure 3-9.

Figure 3-9: Scheme Transport Model Road Network in the Scheme area



Modelled time periods

3.3.8 The A585 base year SATURN model has been developed for the following time periods for an average weekday in June 2015, with the average hour being used within each time range:

- AM Peak Period: 07:30 – 9:30
- Inter-Peak Period: 09:30 – 15:00
- PM Peak Period: 15:00 – 18:00

Demand segmentation

3.3.9 The A585 highway assignment model represents highway demand in three vehicle classes: cars, Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs). The car vehicle type is further split by journey purpose into commuting, employer's business and other trips to allow for variations in travel cost. Table 3-3 shows the five demand segments used in the A585 highway assignment model.

Table 3-3: A585 Model User Classes

Vehicle Type	Journey Purpose
Car	Commuting
Car	Employer's Business
Car	Other trips
LGV	-
HGV	-

Matrix development

3.3.10 The approach used to develop the trip matrices differed according to the type of vehicle. For cars, observed data from the RSI data sets listed in Table 2-1 was used to calculate trip cost distributions for the three journey purposes. After expansion to traffic counts, the data was used as one of the inputs to a gravity model which synthesised full trip matrices for each purpose in each time period. These matrices were scaled to the assignment hours, using factors derived from the RSI records, subjected to some large-scale manual adjustments to create reasonable priors, and adjusted with matrix estimation process to match traffic counts at a number of calibration locations distributed across the ADM.

3.3.11 No freight modelling was carried out for this model, due to a lack of the trip ends that are required in order to do so. Additionally, no gravity modelling was performed for LGVs or HGVs due to a lack of required data concerning trip ends. The prior matrices for both types of goods vehicle were therefore built from the available RSI records and matrix estimation processes were used to adjust them to a better match to the calibration traffic counts.

3.3.12 The different data sources used in the building of the A585 base year trip matrices are:

- RSI records from several datasets
- Classified traffic counts at a number of locations across the ADM
- Trip ends by time period and journey purpose from TEMPRO 7.0
- Resident Populations by Census 2011 Output Area
- Generalised costs of travel, produced by assigning the partially observed matrices with the SATURN model
- Estimates of intra-zonal travel as a proportion of all travel for external zones, derived from Census 2011 journey to work data

Highway assignment model

3.3.13 A highway network assignment model provides a representation of the strategic road network and the supporting local network, forming a basis of both the traffic assignment and the derivation of travel times and costs for input to a variable demand model.

3.3.14 The A585 highway assignment transport model has been developed using the SATURN (Simulation and Assignment of Traffic to Urban Road Networks) suite of programs.

3.3.15 SATURN Version 11.3.12W was adopted for the assignment of the base and forecast traffic matrices onto the modelled highway network

Variable demand model

3.3.16 In accordance with TAG Unit M2 Variable Demand Modelling a Scheme Variable Demand Model (VDM) was prepared to predict and quantify the changes in forecast demand on the highway network.

3.3.17 The A585 Windy Harbour to Skippool Improvement Scheme VDM uses the DIADEM software (5.0) issued on behalf of the DfT for the purpose of producing the traffic forecasts for the A585 Windy Harbour to Skippool Improvement Scheme transport model.

3.3.18 DIADEM is an incremental hierarchical logit model and works by adjusting an input reference demand matrix according to changes between forecast travel costs and input reference travel costs.

3.3.19 The VDM process consists of a series of iterations between DIADEM and SATURN (assignment model) during which demand matrices are assigned, skimmed cost matrices are extracted and, based on comparative travel costs, the demand matrices are updated.

3.3.20 DIADEM provides a means of achieving convergence between the assignment (supply) and demand models. It is to be noted that equilibrium between the demand and supply models is not found exactly and therefore, a TAG specified convergence criteria is used to determine when the solution is close enough to equilibrium.

3.3.21 There are four variable demand mechanisms in DIADEM, namely: trip frequency, mode choice, trip distribution and time of day choice.

The A585 VDM uses frequency, time period choice and trip distribution models. As there is no explicit main mode choice included in the VDM, a frequency response has been added to represent the possible shift of trips to or from car. No public transport modelling or land-use/transport interaction has been undertaken in relation to the proposed Scheme.

Forecast years

3.3.22 Traffic forecasts for the Scheme have been prepared for the following model years:

- Scheme opening year - 2022
- Design year – 2037 (15 years after opening)
- NTEM Version 7.2 Horizon year - 2051

3.3.23 Two forecast years, the Year of Opening 2022 and the Design Year 2037 were considered for the Scheme design, highway operational assessment and environmental assessment purposes.

Traffic growth

3.3.24 The growth in reference case demand between the base year and the forecast years is derived from the following sources:

- National long-term population, employment and transport forecasts published by the DfT in NTEM (version 7.2)
- Goods vehicle growth using the latest NTM forecasts; RTF 2015, which was released in March 2015
- Local planning data from the Blackpool, Fylde and Wyre Local Authorities

3.3.25 Traffic forecasts have been prepared for the Core Scenario which is founded on the most unbiased and realistic set of assumptions and forms the central case for the Scheme. The principal aim of these forecasts was to provide traffic data outputs from the forecast year transport models for the economic, environmental and operational assessment of the Scheme.

3.3.26 National uncertainty concerns national projections such as demographic data (population, households and employment), Gross Domestic Product (GDP) growth and fuel price trends. This is accounted for through the development of a set of alternative Low and Optimistic Growth Scenarios which are designed to examine the effects of low and high growth either side of the most likely scenario (known as the Core Scenario), to assess the effects of the uncertainty on the Scheme economic appraisal.

Local development

3.3.27 Local sources of uncertainty typically relate to whether planned residential and commercial developments and transport network schemes go ahead in the vicinity of the Scheme being built. This is accounted for through the development of an Uncertainty Log which highlights the planned developments which will impact on transport supply and demand. Typically, the uncertainty log includes information on the location, timing, size and nature of proposed developments and transport infrastructure improvements.

3.3.28 The Scheme Uncertainty Log was prepared in accordance with TAG Unit M4 Forecasting and Uncertainty. The Scheme Uncertainty Log includes the area governed by three local authorities within Lancashire County Council, Blackpool Council, Fylde Council and Wyre Council as shown in Figure 3-10.

3.3.29 Highways England consulted with Lancashire County Council, Blackpool Council, Fylde Council and Wyre Council to obtain information regarding the planning status of future developments in the study area. Local development data was obtained from Blackpool Council and Fylde Council in November 2017. Wyre Council was unable to provide the planning status and quantum of future developments within the Wyre Council area and suggested that Highways England prepare this information based on the Publication Draft Wyre Local Plan, September 2017, Wyre Council. Assumptions were therefore made by Highways England regarding the level of certainty, timing, quantum, land-use and trip rates of the developments included in the Scheme Uncertainty Log in the Wyre Council Local Authority area.

Figure 3-10: Local Authorities included in the Scheme Uncertainty Log

3.3.30 The following three forecast demand scenarios were appraised and are summarised in Table 3-4.

- Core Scenario incorporating NTEM background national growth and local development identified as Near Certain and More than Likely classification
- Low Growth scenario incorporating Low background national growth and local development identified as Near Certain and More than Likely classification
- Optimistic Growth scenario incorporating High background national growth and local development identified as Near Certain, More than Likely and Reasonably Foreseeable classification.

3.3.31 A development classification of “Near Certain” and “More than Likely” (and therefore included in the Core Scenario and used in the Environmental and Operational Assessment of the Scheme) was categorised by the Local Authorities in response to the Uncertainty Log Stakeholder consultation as “development under construction”, “approved development proposals” or “developments with a planning application within the consent process”. Development classified as Reasonably Foreseeable is identified as development that may happen, but there is significant uncertainty. Reasonably Foreseeable development includes development identified in the Local Plan or committed policy goals. As identified in TAG Unit M4 Forecasting and Uncertainty, Table A2 Classification of Inputs, p31, 2017 Reasonably Foreseeable development has been excluded from the Core Scenario.

Table 3-4 : Forecast Demand Scenarios

Scenario	Supply	Demand	TEMPro Constraint
Core	Schemes that are: • Near Certain and • More Than Likely.	Developments that are: • Near Certain and • More Than Likely.	Standard TEMPro
Optimistic Growth	Schemes that are: • Near Certain • More Than Likely and • Reasonably Foreseeable.	Developments that are: • Near Certain • More Than Likely and • Reasonably Foreseeable.	High Growth TEMPro
Low Growth	Schemes that are: • Near Certain and • More Than Likely.	Developments that are: • Near Certain and • More Than Likely.	Low Growth TEMPro

3.3.32 The total number of proposed dwellings and employment from the Scheme’s Uncertainty Log by individual authority is summarised in Table 3-5.

Table 3-5: Uncertainty Log Local Housing and Employment Developments Summary

Council	Near Certain/More than Likely		Reasonably Foreseeable		Total	
	Dwellings	Employment (ha)	Dwellings	Employment (ha)	Dwellings	Employment (ha)
Fylde	6,537	16.71	442	24.28	6,979	40.99
Blackpool	1,252	7.31	-	8.10	1,252	15.41
Wyre	3,716	8.11	2,292	32.08	6,008	40.19
Total	11,505	32.14	2,734	64.46	14,239	96.59

3.3.33 In addition to proposed developments, the treatment of uncertainty in model forecasting should also include any proposed highway infrastructure schemes.

3.3.34 The definition of the Without Scheme network requires the identification of any committed or probable highway schemes within the study area that should be included in the transport model.

3.3.35 The proposed network improvements which are likely to be in place by each forecast modelled year are included in both Without Scheme and With Scheme forecast networks.

3.3.36 Following consultation with the Lancashire County Council, the highway schemes described in Table 3-6 have been included in the Without Scheme forecast network:

Table 3-6: Uncertainty Log Summary of Highway Schemes

Ref.	Local Authority	Highway Scheme	Level of Certainty
1	Highways England	A585/A586 Windy Harbour junction improvement	Certain
2	Lancashire County Council	M55 to A583 Preston Western Distributor (PWD)	More than Likely
3	Lancashire County Council	A6 Broughton Bypass	More than Likely
4	Lancashire County Council	East West Link Road (North West Preston) (linked to PWD)	More than Likely
5	Lancashire County Council	M55 new J2 (part of PWD)	More than Likely
6	Lancashire County Council	Cottam Link Road (part of PWD)	More than Likely
7	Fylde Council	Lytham Moss M55 to St Annes / Heyhouses Link Road	More than Likely

3.3.37 The A585/A586 Windy Harbour junction improvement was already in place by year 2015 and hence, was included in the A585 base year SATURN model.

3.3.38 The proposed Scheme was added to the forecast year Without Scheme networks to create the With Scheme scenario for each forecast year.

4 CURRENT NETWORK PERFORMANCE

4.1 Summary

4.1.1 The A585 Windy Harbour to Skippool Improvement Scheme base year transport model (model version B003) has been developed to assess the benefits of the proposed Scheme.

4.1.2 The development of a transport model for the proposed Scheme that represents observed conditions helps to ensure that it is suitable for scheme assessment and does not lead to bias in the decision-making process.

4.1.3 The A585 Windy Harbour to Skippool Improvement Scheme base year transport model (2015) was validated using the July 2017 v1.8 TAG databook release of Values of Time (VoT) and Vehicle Operating Costs (VOC).

4.1.4 The calibration of a highway assignment model is the process used to ensure that the model adequately reproduces the travel patterns of road users in the geographic area under consideration.

4.1.5 The validation of a highway assignment model is the process by which modelled data is compared to observed data that is independent from that used in model calibration.

4.1.6 The transport model validation acceptability guidelines as outlined in TAG Unit M3.1 are shown in Table 4-1 to Table 4-3 respectively and were used to measure the quality of the transport model trip matrices and the assignment.

Table 4-1: Screenline Flow Validation Criterion and Acceptability Guideline

Criteria	Acceptability Guideline
Differences between modelled flows and counts should be less than 5% of counts	All or nearly all screenlines

Source – TAG Unit M3.1, paragraph 3.2.5

Table 4-2: Link Flow/Turning Movement Validation Criteria and Acceptability Guidelines

Criteria	Description of Criteria	Acceptability Guideline
Flow Difference Criterion (1)	Individual flows within 100veh/h of counts for flows <700veh/h	> 85% of cases
	Individual flows within 15% of counts for flows from 700 to 2,700veh/h	> 85% of cases
	Individual flows within 400 veh/h of counts for flows > 2,700veh/h	> 85% of cases
GEH Criterion (2)	GEH < 5 for individual flows	> 85% of cases

Source – TAG Unit M3.1, paragraph 3.2.8

Table 4-3: Journey Time Validation Criterion and Acceptability Guideline

Criteria	Acceptability Guideline
Modelled journey time along routes should be within 15% of surveyed times (or 1 minute if higher than 15%)	> 85% of all routes

Source – TAG Unit M3.1, paragraph 3.2.10

4.1.7 The calibration and validation details of how the Scheme transport model performs in the base year of 2015, by comparing the model with observed data is summarised in the remainder of this chapter. The flow difference criterion and the GEH criterion are broadly comparable and link flows that meet either criterion should be regarded as satisfactory. The base year transport model calibration and validation results show that the base year transport model satisfactorily meets DfT TAG acceptability criteria.

4.2 Overview of Base Year Flows

4.2.1 The screenlines used in the calibration of the Scheme transport model are shown in Figure 4-1.

4.2.2 The results of the screenline and cordon calibration are shown in Table 4-4 to Table 4-6 for the three modelled time periods.

4.2.3 The results of the flow validation are shown in Table 4-7 to Table 4-9 for the three modelled time periods by direction of travel and shown graphically in Figure 4-2 to Figure 4-4. The directions of travel include Northbound (NB), Southbound (SB), Eastbound (EB) and Westbound (WB).

4.2.4 The model screenline and flow calibration and validation flow results show that the model performs satisfactorily across all three time periods based on total vehicles.

Figure 4-1: Calibration Screenlines and Cordon

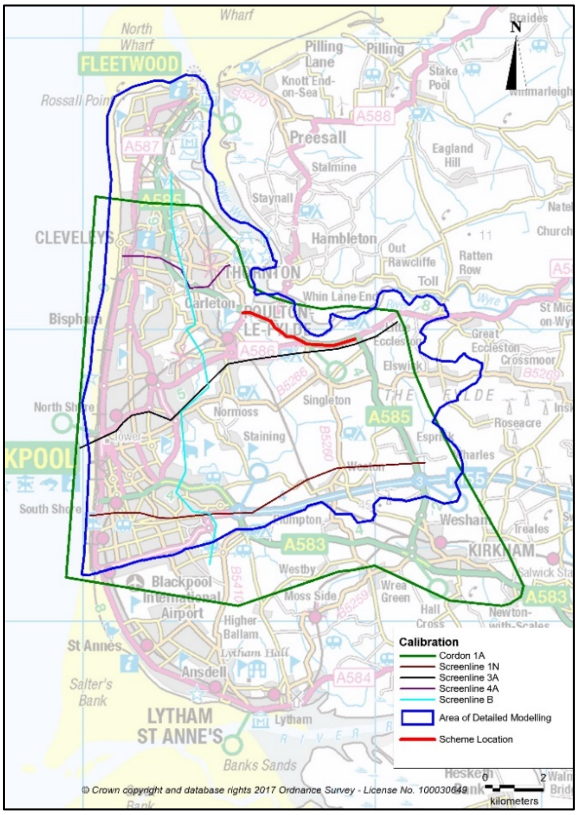


Table 4-4: B003 Screenline Calibration Summary - AM Peak

Screenline	Dir	Observed	Modelled	Difference	% Difference	GEH	Flow Pass	GEH Pass
1A	IN	8,441	8,220	-220	-2.6	2.4	✓	✓
	OUT	8,258	8,041	-217	-2.6	2.4	✓	✓
B	EB	6,020	5,823	-196	-3.3	2.6	✓	✓
	WB	6,305	5,926	-379	-6.0	4.9	×	✓
3A	NB	3,750	3,678	-73	-1.9	1.2	✓	✓
	SB	4,535	4,548	13	0.3	0.2	✓	✓
4A	NB	3,008	2,826	-182	-6.1	3.4	×	✓
	SB	3,332	3,393	61	1.8	1.1	✓	✓
1N	NB	5,889	5,676	-213	-3.6	2.8	✓	✓
	SB	5,852	5,781	-71	-1.2	0.9	✓	✓
Screenlines complying with TAG acceptability criteria							8/10	10/10
Percentage of Screenlines complying with TAG acceptability criteria							80%	100%

Table 4-5: B003 Screenline Calibration Summary - Inter Peak

Screenline	Dir	Observed	Modelled	Difference	% Difference	GEH	Flow Pass	GEH Pass
1A	IN	6,649	6,110	-539	-8.1	6.8	×	×
	OUT	6,544	6,423	-121	-1.8	1.5	✓	✓
B	EB	5,394	5,267	-127	-2.4	1.7	✓	✓
	WB	5,323	5,218	-105	-2.0	1.4	✓	✓
3A	NB	3,616	3,500	-115	-3.2	1.9	✓	✓
	SB	3,250	3,325	76	2.3	1.3	✓	✓
4A	NB	2,759	2,633	-125	-4.5	2.4	✓	✓
	SB	2,705	2,771	66	2.4	1.3	✓	✓
1N	NB	4,625	4,301	-323	-7.0	4.8	×	✓
	SB	4,493	4,548	55	1.2	0.8	✓	✓
Screenlines complying with TAG acceptability criteria							8/10	9/10
Percentage of Screenlines complying with TAG acceptability criteria							80%	90%

Table 4-6: B003 Screenline Calibration Summary - PM Peak

Screenline	Dir	Observed	Modelled	Difference	% Difference	GEH	Flow Pass	GEH Pass
1A	IN	8,733	8,431	-302	-3.5	3.3	✓	✓
	OUT	8,688	8,404	-284	-3.3	3.1	✓	✓
B	EB	6,970	6,679	-291	-4.2	3.5	✓	✓
	WB	6,553	6,256	-297	-4.5	3.7	✓	✓
3A	NB	4,694	4,514	-179	-3.8	2.6	✓	✓
	SB	3,895	4,010	116	3.0	1.8	✓	✓
4A	NB	3,763	3,616	-147	-3.9	2.4	✓	✓
	SB	3,335	3,219	-116	-3.5	2.0	✓	✓
1N	NB	6,448	6,088	-360	-5.6	4.5	×	✓
	SB	5,977	5,823	-154	-2.6	2.0	✓	✓
Screenlines complying with TAG acceptability criteria							9/10	10/10
Percentage of Screenlines complying with TAG acceptability criteria							90%	100%

Table 4-7: Summary of B003 Flow Calibration and Validation - AM Peak

Summary of Flow Calibration and Validation (including screenlines and other links)				
Count Type	Total	Number / Percentage Passing DMRB Calibration Criteria		
		Post-ME2		
		Flow Criteria	GEH Criteria	TAG
Calibration				
Screenline Links	104	88	89	90
Other Links	46	44	43	44
Total Links	**150**	**132**	**132**	**134**
		88%	**88%**	**89%**
Turns	92	89	75	89
		97%	**82%**	**97%**
Total (Links and Turns)	**242**	**221**	**207**	**223**
		91%	**86%**	**92%**
Valdation				
Screenline Links	20	15	14	15
Other Links	32	26	24	29
Total Links	**52**	**41**	**38**	**44**
		79%	**73%**	**85%**
Turns	**20**	**18**	**18**	**20**
		90%	**90%**	**100%**
Total (Links and Turns)	**72**	**59**	**56**	**64**
		82%	**78%**	**89%**
(Calibration + valdation)				
Screenline Links	124	103	103	105
Other Links	78	70	67	73
Total (Links)	**202**	**173**	**170**	**178**
		86%	**84%**	**88%**
Total (Turns)	**112**	**107**	**93**	**109**
		96%	**83%**	**97%**
Total (Links+Turns)	**314**	**280**	**263**	**287**
		89%	**84%**	**91%**

Table 4-8: Summary of B003 Flow Calibration and Validation - Inter-Peak

Summary of Flow Calibration and Validation (including screenlines and other links)				
Count Type	Total	Number / Percentage Passing DMRB Calibration Criteria		
		Post-ME2		
		Flow Criteria	GEH Criteria	TAG
Calibration				
Screenline Links	104	92	87	93
Other Links	46	46	45	46
Total Links	**150**	**138**	**132**	**139**
		92%	**88%**	**93%**
Turns	92	91	75	91
		99%	**82%**	**99%**
Total (Links and Turns)	**242**	**229**	**207**	**230**
		95%	**86%**	**95%**
Valdation				
Screenline Links	20	20	19	20
Other Links	32	30	25	30
Total Links	**52**	**50**	**44**	**50**
		96%	**85%**	**96%**
Turns	**20**	**20**	**19**	**20**
		100%	**95%**	**100%**
Total (Links and Turns)	**72**	**70**	**63**	**70**
		97%	**88%**	**97%**
(Calibration + valdation)				
Screenline Links	124	112	106	113
Other Links	78	76	70	76
Total (Links)	**202**	**188**	**176**	**189**
		93%	**87%**	**94%**
Total (Turns)	**112**	**111**	**94**	**111**
		99%	**84%**	**99%**
Total (Links+Turns)	**314**	**299**	**270**	**300**
		95%	**86%**	**96%**

Table 4-9: Summary of B003 Flow Validation - PM Peak

Summary of Flow Calibration and Validation (including screenlines and other links)				
Count Type	Total	Number / Percentage Passing DMRB Calibration Criteria		
		Post-ME2		
		Flow Criteria	GEH Criteria	TAG
Calibration				
Screenline Links	104	89	89	90
Other Links	46	45	44	45
Total Links	**150**	**134**	**133**	**135**
		89%	**89%**	**90%**
Turns	92	80	72	82
		87%	**78%**	**89%**
Total (Links and Turns)	**242**	**214**	**205**	**217**
		88%	**85%**	**90%**
Valdation				
Screenline Links	20	17	16	17
Other Links	32	28	24	28
Total Links	**52**	**45**	**40**	**45**
		87%	**77%**	**87%**
Turns	**20**	**18**	**16**	**19**
		90%	**80%**	**95%**
Total (Links and Turns)	**72**	**63**	**56**	**64**
		88%	**78%**	**89%**
(Calibration + valdation)				
Screenline Links	124	106	105	107
Other Links	78	73	68	73
Total (Links)	**202**	**179**	**173**	**180**
		89%	**86%**	**89%**
Total (Turns)	**112**	**98**	**88**	**101**
		88%	**79%**	**90%**
Total (Links+Turns)	**314**	**277**	**261**	**281**
		88%	**83%**	**89%**

Figure 4-2: B003 AM Peak Link Calibration

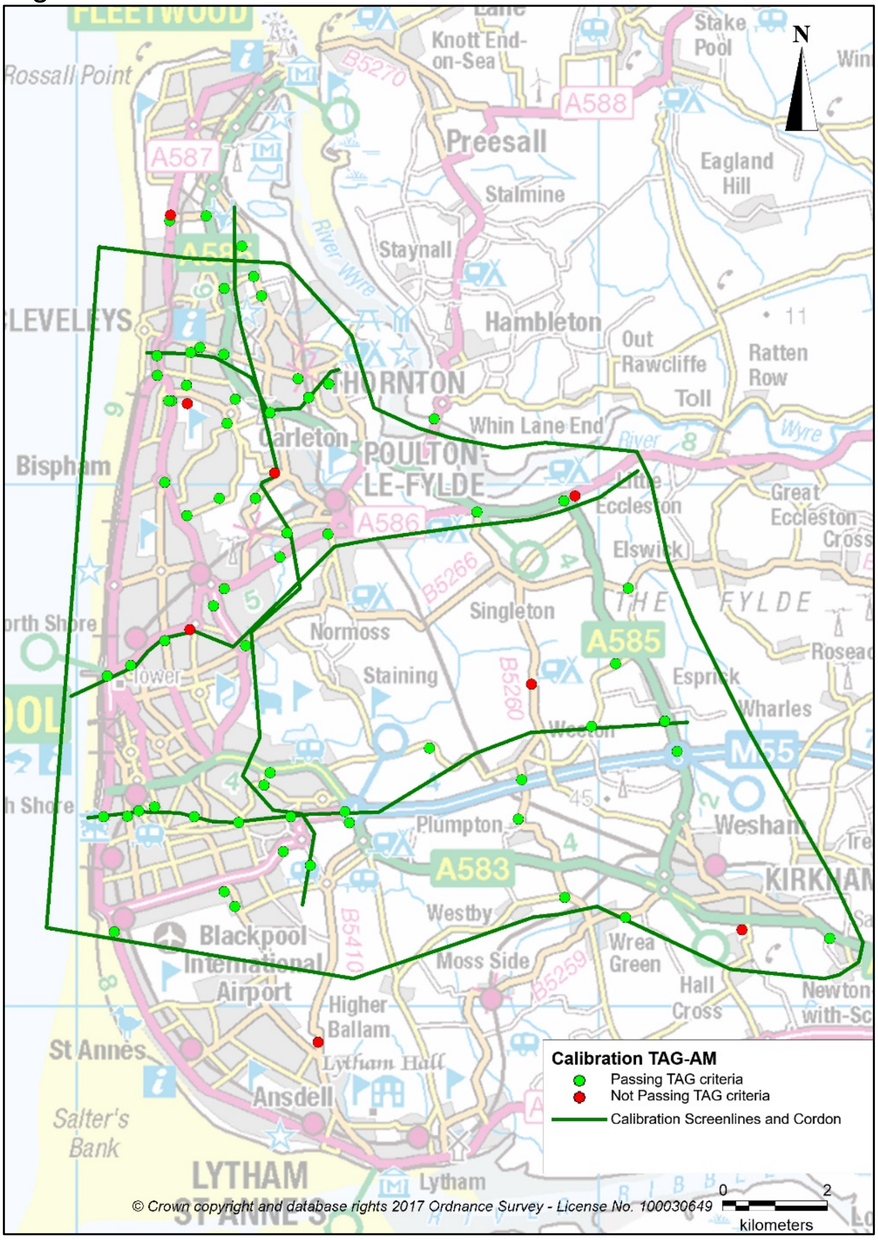


Figure 4-3: B003 Inter Peak Link Calibration

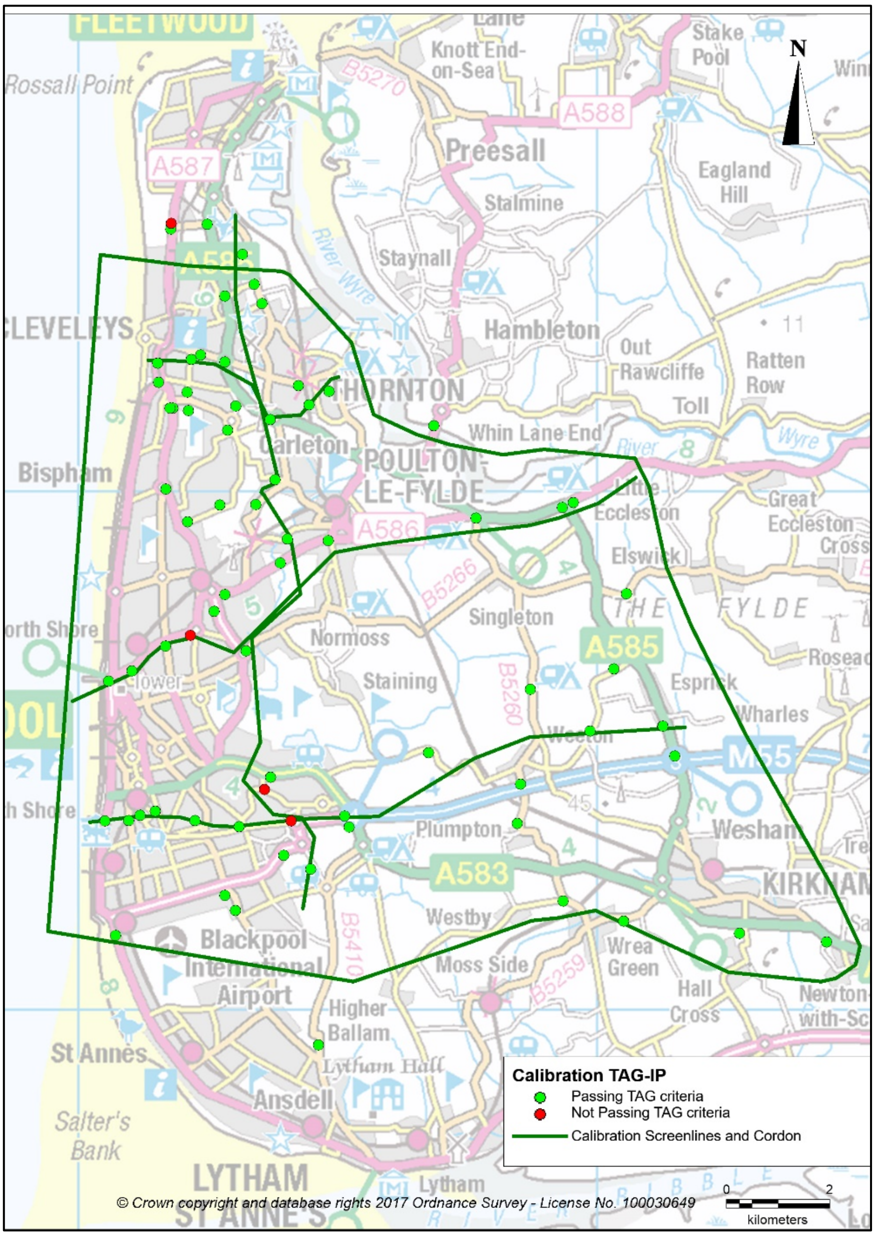
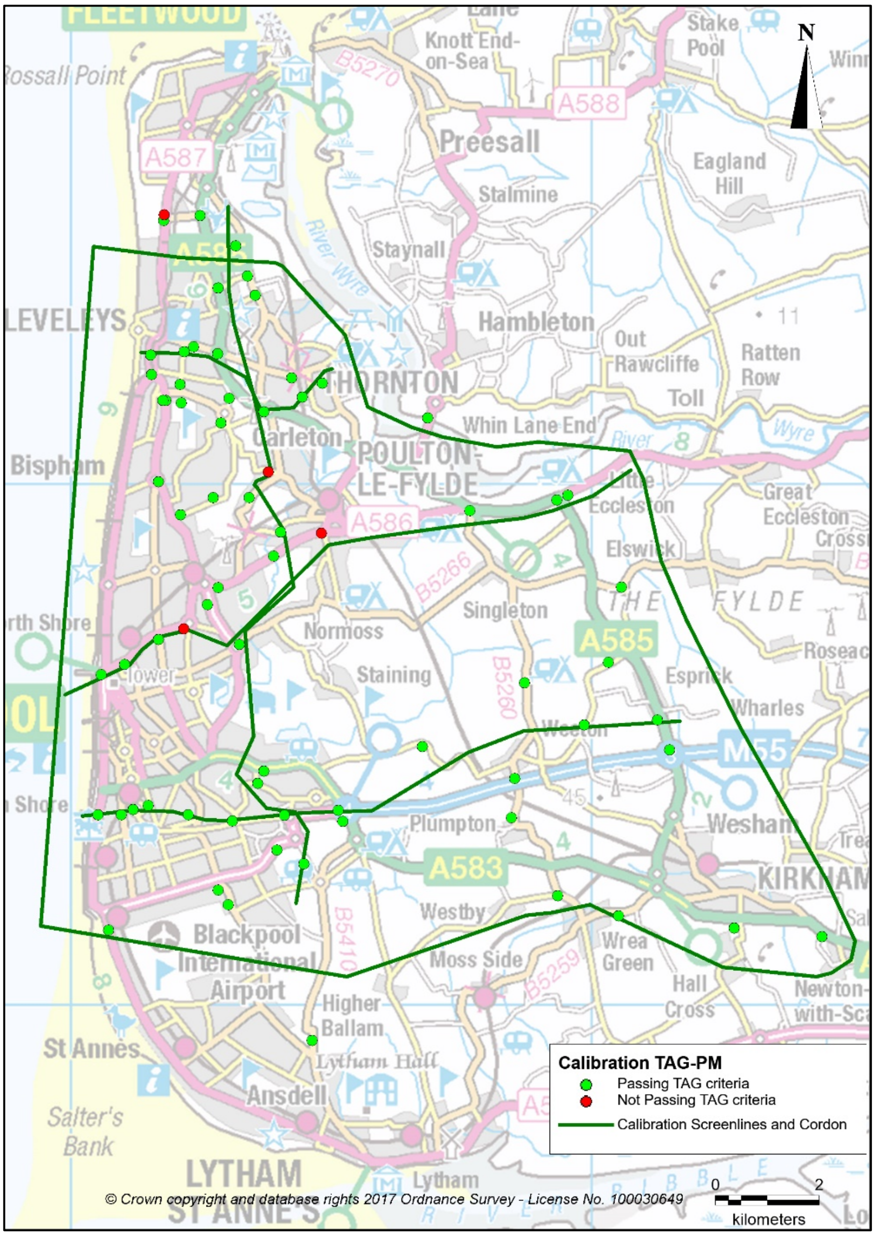


Figure 4-4: B003 PM Peak Link Calibration



4.3 Overview of Journey Times

4.3.1 The modelled journey times were extracted for each modelled time period and compared with the corresponding observed journey time information as a check on the quality of the network and the assignment. Journey time data was extracted from the Trafficmaster database for the 14 two directional journey time routes (28 routes by direction) as shown in Figure 4-5. The Trafficmaster GPS link time for each route was extracted using the ITN layer.

4.3.2 The journey time validation results for each of routes across all three modelled time periods is shown in Table 4-10. It is seen that 26 out of the 28 journey time routes in the AM and Inter-Peak, and 27 out of 28 routes in the PM Peak meet the TAG journey time acceptability criteria.

Figure 4-5: Journey Time Routes

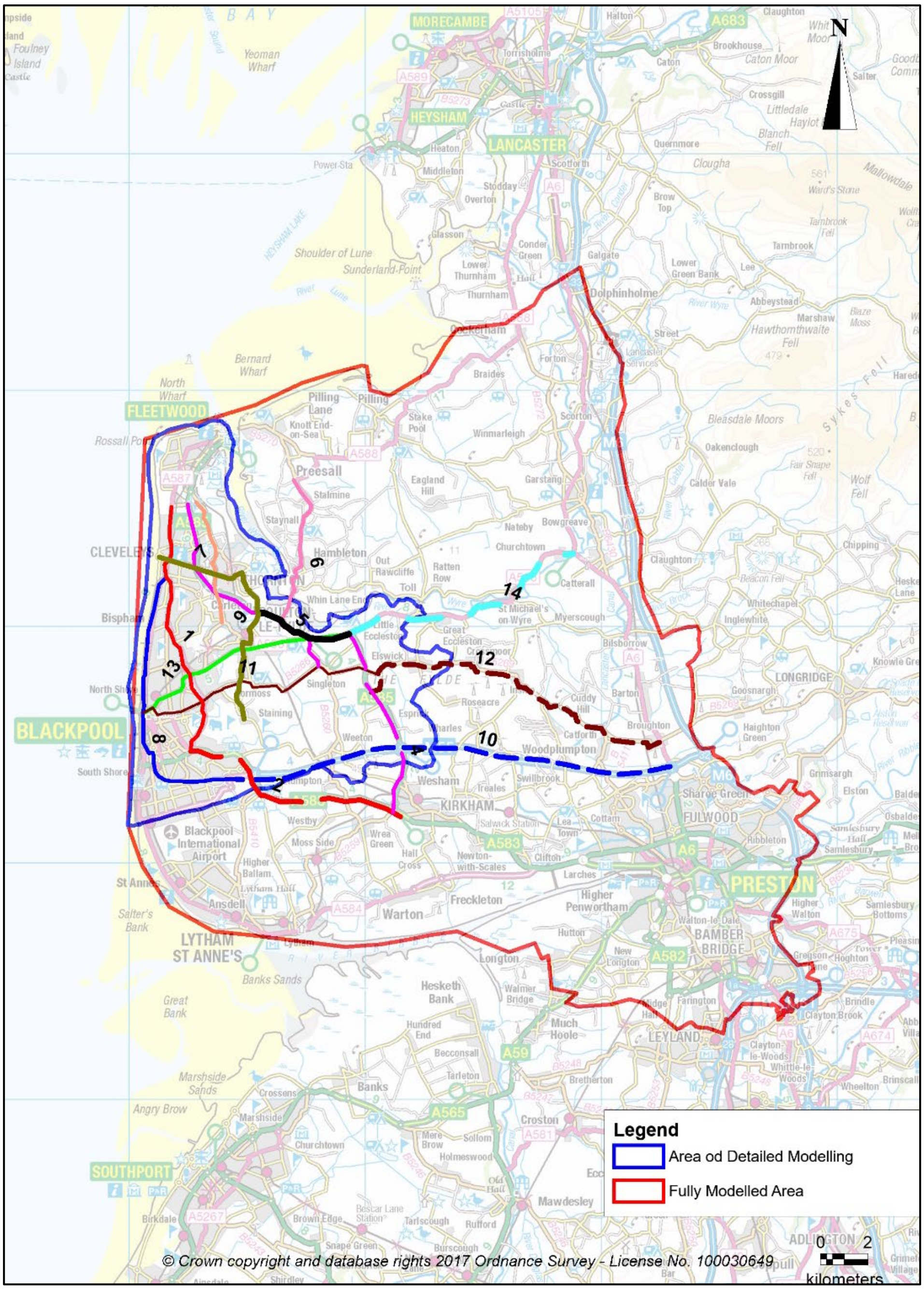


Table 4-10: B003 Journey Time Validation Results

Route Name	B003 – AM Peak Journey Time (secs)					B003 – Inter Peak Journey Time (secs)					B003 – PM Peak Journey Time (secs)				
	Observed	Modelled	Diff (secs)	% Diff	Criteria	Observed	Modelled	Diff (secs)	% Diff	Criteria	Observed	Modelled	Diff (secs)	% Diff	Criteria
1 NB	1,171	1,264	-93	8%	Pass	1,170	1,263	-93	8%	Pass	1,252	1,380	-128	10%	Pass
1 SB	1,191	1,342	-151	13%	Pass	1,165	1,311	-146	13%	Pass	1,205	1,352	-147	12%	Pass
2 NB	723	714	9	-1%	Pass	715	699	16	-2%	Pass	730	723	7	-1%	Pass
2 SB	692	677	15	-2%	Pass	696	644	52	-7%	Pass	700	653	47	-7%	Pass
3 EB	775	827	-52	7%	Pass	743	801	-58	8%	Pass	940	848	92	-10%	Pass
3 WB	786	834	-48	6%	Pass	706	819	-113	16%	Fail	729	852	-123	17%	Fail
4 EB	523	530	-7	1%	Pass	524	513	11	-2%	Pass	528	555	-27	5%	Pass
4 WB	520	526	-6	1%	Pass	522	492	30	-6%	Pass	517	495	22	-4%	Pass
5 NB	307	337	-30	10%	Pass	293	336	-43	15%	Pass	332	349	-17	5%	Pass
5 SB	378	329	49	-13%	Pass	301	320	-19	6%	Pass	316	326	-10	3%	Pass
6 NB	463	449	14	-3%	Pass	470	448	22	-5%	Pass	463	492	-29	6%	Pass
6 SB	494	559	-65	13%	Pass	493	474	19	-4%	Pass	491	499	-8	2%	Pass
7 NB	486	477	9	-2%	Pass	495	475	20	-4%	Pass	542	487	55	-10%	Pass
7 SB	538	576	-38	7%	Pass	524	566	-42	8%	Pass	543	618	-75	14%	Pass
8 NB	1,006	1,064	-58	6%	Pass	1,071	1,025	46	-4%	Pass	1,169	1,134	35	-3%	Pass
8 SB	998	1,096	-98	10%	Pass	1,066	1,023	43	-4%	Pass	1,127	1,084	43	-4%	Pass
9 NB	1,123	1,111	12	-1%	Pass	1,077	1,089	-12	1%	Pass	1,155	1,125	30	-3%	Pass
9 SB	1,144	1,129	15	-1%	Pass	1,132	1,093	39	-3%	Pass	1,191	1,117	74	-6%	Pass
10 EB	615	644	-29	5%	Pass	637	638	-1	0%	Pass	624	646	-22	3%	Pass
10 WB	636	648	-12	2%	Pass	629	638	-9	1%	Pass	603	646	-43	7%	Pass
11 EB	949	1,074	-125	13%	Pass	945	1,006	-61	6%	Pass	983	1,041	-58	6%	Pass
11 WB	966	1,164	-198	21%	Fail	985	1,069	-84	9%	Pass	1,001	1,110	-109	11%	Pass
12 EB	1,272	1,173	99	-8%	Pass	1,237	1,163	74	-6%	Pass	1,246	1,169	77	-6%	Pass
12 WB	1,181	1,243	-62	5%	Pass	1,136	1,162	-26	2%	Pass	1,136	1,165	-29	3%	Pass
13 EB	970	1,226	-256	26%	Fail	950	1,104	-154	16%	Fail	999	1,145	-146	15%	Pass
13 WB	932	1,028	-96	10%	Pass	919	964	-45	5%	Pass	955	1,009	-54	6%	Pass

Route Name	B003 – AM Peak Journey Time (secs)					B003 – Inter Peak Journey Time (secs)					B003 – PM Peak Journey Time (secs)				
	Observed	Modelled	Diff (secs)	% Diff	Criteria	Observed	Modelled	Diff (secs)	% Diff	Criteria	Observed	Modelled	Diff (secs)	% Diff	Criteria
14 EB	628	582	46	-7%	Pass	647	585	62	-10%	Pass	630	604	26	-4%	Pass
14 WB	634	625	9	-1%	Pass	654	631	23	-4%	Pass	647	639	8	-1%	Pass
					26 / 28					**26 / 28**					**27 / 28**
					93%					93%					96%

5 FUTURE NETWORK PERFORMANCE

5.1 Introduction

5.1.1 Future year traffic flows are required for the design of the A585 Windy Harbour to Skippool Improvement Scheme and also for the Scheme highway design, environmental, operational and economic assessment purposes.

5.1.2 The Without Scheme represents elements that are either near certain or more than likely to be delivered. The Without Scheme scenario should represent a realistic view of what is likely to happen in the absence of any specific scheme proposals. It should focus on maintaining present transport facilities and implementing the more certain aspects of regional and local strategies.

5.1.3 The Without Scheme and With Scheme scenario was produced by running the Scheme VDM using the reference demand, the changes to the generalised cost assumptions and the revised highway networks to achieve equilibrium of the demand and the travel costs.

5.1.4 This chapter describes the A585 Windy Harbour to Skippool Improvement Scheme Core Scenario forecast transport model (model version VDM_06) results.

5.2 Area Wide Changes in Traffic Volume

5.2.1 The forecast changes in Core Scenario area wide traffic flows on the highway network between the 2015 base year and forecast years due to the Scheme are shown in Figure 5-1 to Figure 5-3 in the Design Year (2037). Links highlighted green indicate an increase in traffic flow and links highlighted blue indicate a decrease in traffic flow. The plots show the change in pattern of the traffic and not traffic volume detail. The increase shown in green is approximately 200-300 vehicles an hour on the A585 and A586. A schematic showing further details of the Scheme traffic flows is contained in Appendix A.

5.2.2 The figures show the growth in highway flows across all three time periods, particularly for the movements on the strategic A585 Windy Harbour to Skippool Improvement Scheme corridor.

5.2.3 The largest changes in the highway flow across all modelled time periods occur on the strategic route of the A585. The Scheme benefits the long-distance traffic that use the strategic roads of A585 and M55 to travel from the authorities of Wyre and Fylde and Blackpool to the rest of UK.

5.2.4 It can be seen that the traffic from Blackpool and Wyre using the local roads to reach the M55 in the Without Scheme, now heads towards the A585 in the With Scheme option. A reduction of trips is forecast on other roads.

5.2.5 The high negative values seen in the SATURN transport model plots on the A585 between the Windy Harbour junction and the Skippool junction is as a result of the shift of traffic from the existing A585 to the Scheme. The reduced traffic flow on the de-trunked section due to the Scheme has the potential to improve the local environment along the de-trunked section and should encourage walking and cycling.

Figure 5-1: Core Scenario Changes in Traffic Flow (2037 With Scheme to Without Scheme - AM)

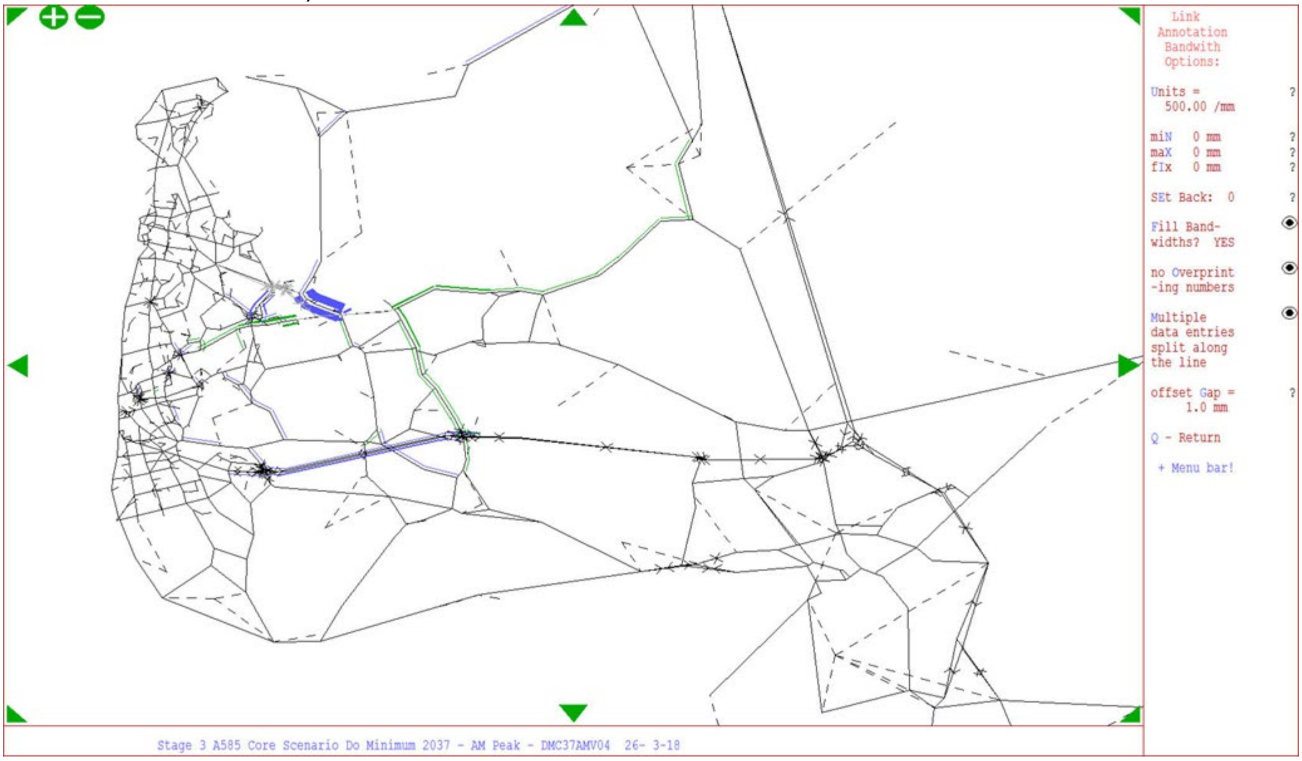


Figure 5-2: Core Scenario Changes in Traffic Flow (2037 With Scheme to Without Scheme - IP)

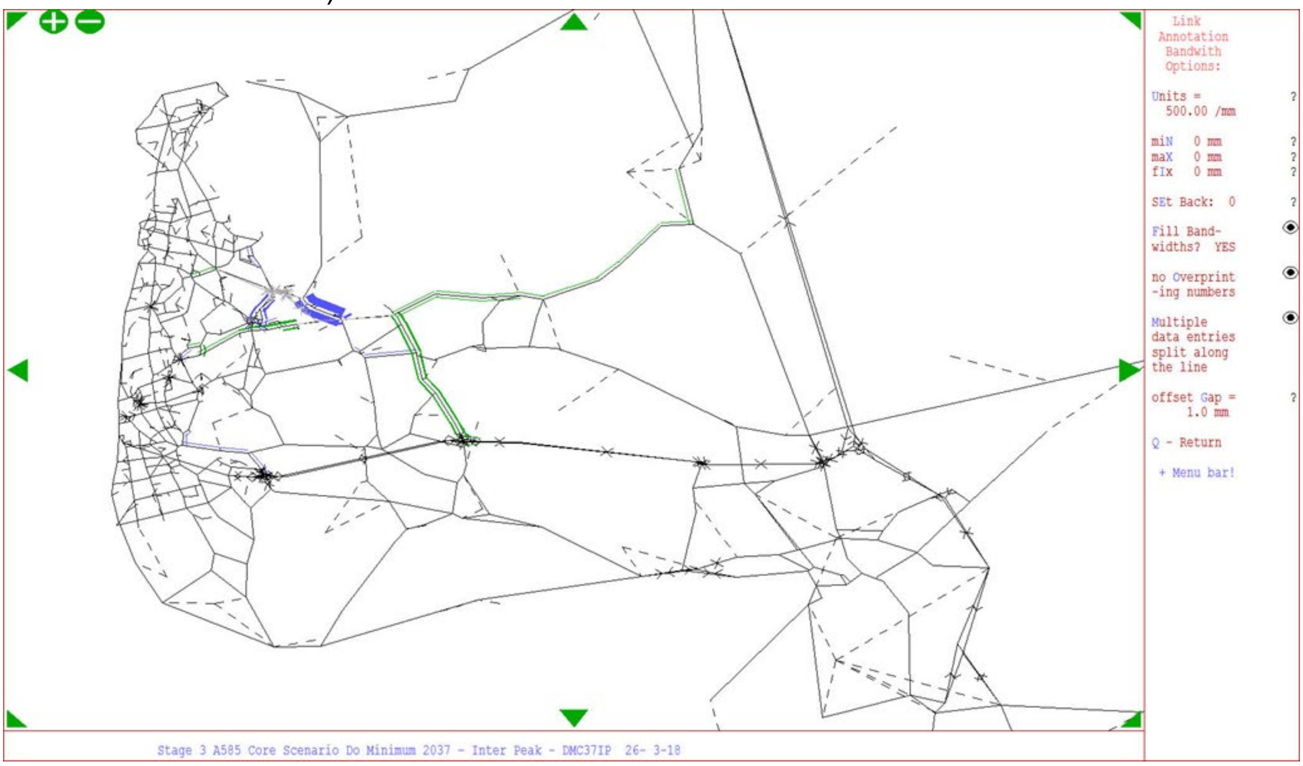
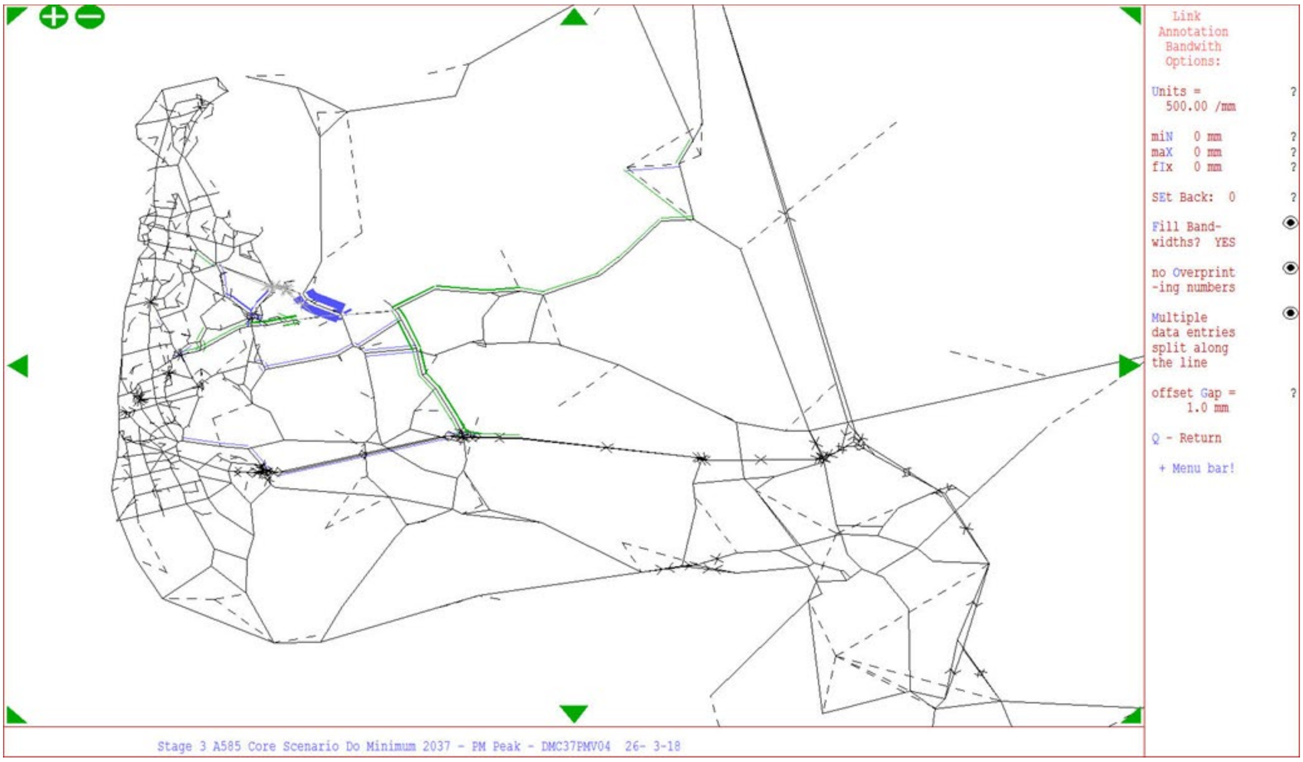


Figure 5-3: Core Scenario Changes in Traffic Flow (2037 With Scheme to Without Scheme - PM)



5.3 Core Scenario Traffic Forecasts on the A585 (From Windy Harbour junction to Skippool junction)

5.3.1 A summary of the forecast Core Scenario traffic flow on the A585 from Windy Harbour junction to Skippool junction for the Without Scheme and With Scheme scenario is shown in Table 5-1 to Table 5-2 for the future years for the modelled time periods. The traffic on the new Scheme links in the With Scheme case is compared against the existing A585 links in the Without Scheme case.

5.3.2 It can be seen that the most heavily trafficked section of the A585 is between the Little Singleton junction and the Windy Harbour junction.

5.3.3 A reduction in flow is observed compared to the Without Scheme scenario between Skippool junction and Skippool Bridge junction representing the route choice road users have to access the Poulton Industrial estate via the Scheme or via Breck Road. Overall traffic levels are not forecast to impact on Breck Road due to the Scheme in future years in the With Scheme scenario compared to the Without Scheme scenario. In addition, as Mains Lane will continue to carry some residual traffic in the With Scheme Scenario eastbound in the morning peak, there is a reduction in flow on the Scheme between the Skippool Bridge junction and the Poulton junction compared to the A585 between Shard Road junction and Little Singleton junction in the Without Scheme scenario.

5.3.4 As reported in the Scheme description paragraph 2.3.6 the Norcross roundabout and surrounding area is predicted to become severely congested, with and without the proposed A585 Windy Harbour to Skippool Improvement Scheme. Options for improving the operation of the Norcross junction are currently being considered independent of the A585 Windy Harbour to Skippool Improvement Scheme assessment, and therefore the Scheme design, environmental, operational and economic assessment assumes no scheme at the A585 Norcross junction (the adjacent Operations Directorate scheme) is in place in the opening year or design year of the A585 Windy Harbour to Skippool Improvement Scheme. Inclusion of the A585 Norcross scheme would require a separate sensitivity test to determine its impact on the A585 Windy Harbour to Skippool Improvement Scheme as the traffic flows approaching the Scheme are constrained by the existing capacity of the upstream A585 Norcross junction. A sensitivity test would address an otherwise possible limitation of the current Scheme appraisal in terms of assessing the chosen Scheme's resilience to improved throughput of eastbound traffic as a result of any A585 Norcross improvement scheme.

Table 5-1: Model Traffic Flows (in 2022) – A585 Windy Harbour to Skippool Improvement Scheme - Core Scenario (in Vehs/hr)

Location	Without Scheme	With Scheme	% Diff
AM			
EB between Skippool Junction and Shard Road Junction	1302	1212	-7%
WB between Shard Road Junction and Skippool Junction	1329	1367	3%
EB between Shard Road Junction and Little Singleton Junction	1184	1005	-15%
WB between Little Singleton Junction and Shard Road Junction	779	857	10%
EB between Little Singleton Junction and Windy Harbour Junction	1189	1524	28%
WB between Windy Harbour Junction and Little Singleton Junction	1054	1137	8%
IP			
EB between Skippool Junction and Shard Road Junction	1182	1149	-3%
WB between Shard Road Junction and Skippool Junction	1133	1132	0%
EB between Shard Road Junction and Little Singleton Junction	880	887	1%
WB between Little Singleton Junction and Shard Road Junction	808	892	10%
EB between Little Singleton Junction and Windy Harbour Junction	1066	1289	21%
WB between Windy Harbour Junction and Little Singleton Junction	1063	1183	11%
PM			
EB between Skippool Junction and Shard Road Junction	1535	1584	3%
WB between Shard Road Junction and Skippool Junction	1353	1431	6%

Location	Without Scheme	With Scheme	% Diff
EB between Shard Road Junction and Little Singleton Junction	955	1049	10%
WB between Little Singleton Junction and Shard Road Junction	1029	1197	16%
EB between Little Singleton Junction and Windy Harbour Junction	1292	1593	23%
WB between Windy Harbour Junction and Little Singleton Junction	1237	1419	15%

Table 5-2: Model Traffic Flows (in 2037) – A585 Windy Harbour to Skippool Improvement Scheme - Core Scenario (in Vehs/hr)

Location	Without Scheme	With Scheme	% Diff
AM			
EB between Skippool Junction and Shard Road Junction	1355	1283	-5%
WB between Shard Road Junction and Skippool Junction	1488	1654	11%
EB between Shard Road Junction and Little Singleton Junction	1263	1034	-18%
WB between Little Singleton Junction and Shard Road Junction	939	1094	17%
EB between Little Singleton Junction and Windy Harbour Junction	1295	1654	28%
WB between Windy Harbour Junction and Little Singleton Junction	1257	1391	11%
IP			
EB between Skippool Junction and Shard Road Junction	1373	1364	-1%
WB between Shard Road Junction and Skippool Junction	1269	1386	9%
EB between Shard Road Junction and Little Singleton Junction	1070	1061	-1%
WB between Little Singleton Junction and Shard Road Junction	942	1115	18%
EB between Little Singleton Junction and Windy Harbour Junction	1268	1583	25%
WB between Windy Harbour Junction and Little Singleton Junction	1244	1409	13%
PM			
EB between Skippool Junction and Shard Road Junction	1698	1871	10%
WB between Shard Road Junction and Skippool Junction	1385	1560	13%
EB between Shard Road Junction and Little Singleton Junction	1121	1257	12%
WB between Little Singleton Junction and Shard Road Junction	1071	1287	20%
EB between Little Singleton Junction and Windy Harbour Junction	1446	1843	27%
WB between Windy Harbour Junction and Little Singleton Junction	1356	1574	16%

5.3.1 A summary of the daily Core Scenario future traffic flow on the Scheme is shown in Table 5-3. As described in section 2.3 the Scheme is a mostly off-line dual carriageway bypass. The Scheme has a mainline capacity of up to 41,000 vehicles per day per direction. The provision of mainline capacity is therefore in excess of the forecast traffic flow. The A585 mainline traffic flows is not forecast to reach capacity by the design year 2037 showing that the Scheme mainline has reserve capacity to support future development in the area. The Scheme therefore supports economic growth in the area.

Table 5-3: Core Scenario With Scheme demand growth along the A585 (Vehs/hr)

Link	AADT (2022)	AADT (2037)
Skippool Junction to Skippool Bridge Junction Eastbound	17,539	20,388
Skippool Bridge Junction to Poulton Junction Eastbound	12,937	15,049
Poulton Junction to Windy Harbour Junction Eastbound	19,278	22,628
Windy Harbour Junction to Poulton Junction Westbound	16,809	19,623
Poulton Junction to Skippool Bridge Junction Westbound	13,264	15,729
Skippool Bridge Junction to Skippool Junction Westbound	17,195	20,174

5.4 Overview of Journey Times

5.4.1 Information on Core Scenario travel times through the network was extracted from the transport model for the Without Scheme and With Scheme scenario for the forecast years.

5.4.2 Figure 4-4 to Figure 4-5 present the extent of the journey time routes between the Windy Harbour junction and the Skippool junction for the Without Scheme and With Scheme scenarios.

5.4.3 The journey time of the Without Scheme scenario for the extent of the route shown in Figure 4-4 in yellow was extracted from the transport model for each of the model time periods and compared to the journey time of the With Scheme scenario for the extent of the route shown in Figure 4-5 in red in order to ascertain the journey time saving that would result from the implementation of the Scheme.

5.4.4 The results of the Core Scenario journey time analysis by direction on the A585 between Windy Harbour and Skippool junction for the proposed Scheme is shown in Table 5-4. Travel Times were extracted from the transport model for the Eastbound (EB) and Westbound (WB) directions of the Without Scheme and With Scheme journey time routes shown in Figure 5-4 and Figure 5-5 respectively. The difference in journey times between the Without Scheme and With Scheme scenarios of the routes shown was calculated in order to determine the travel time savings forecast to be saved by the Scheme road users if the Scheme is implemented.

Table 5-4: Core Scenario Scheme Journey Time Savings

Year	Route Direction	AM Peak			Inter Peak			PM Peak		
		Without Scheme	With Scheme	Diff (savings)	Without Scheme	With Scheme	Diff (savings)	Without Scheme	With Scheme	Diff (savings)
2022	A585 EB	05:37	03:41	01:56	05:27	03:37	01:40	05:36	03:47	01:49
	A585 WB	05:43	03:29	02:14	05:43	03:28	02:02	07:11	03:41	03:30
2037	A585 EB	05:46	03:31	02:15	05:52	03:23	02:29	06:00	03:33	02:27
	A585 WB	06:03	03:20	02:43	06:12	03:16	02:56	08:04	03:25	04:39

5.4.5 In all modelled time periods the journey times along the Scheme, seem to be reasonable i.e. the Without Scheme being the slowest with a slight increase in journey time savings over the forecast period.

5.4.6 The Scheme is shown to improve road user journey time and reliability. Within the proposed Scheme, in the EB direction in the opening year, there is a journey time saving of around two minutes in the AM, IP and PM peaks. In the WB direction the journey time savings are in the range of 2 minutes for AM and IP and between 3-4 minutes for the PM peak. These journey time savings are maintained in 2037 and 2051 with similar journey time savings observed between model years. The maximum time saving of around 4.5 minutes is observed in the westbound direction in the evening peak.

5.4.7 The Scheme generates Wider Economic Impacts due to improved journey times and reliability for business road users which supports economic growth in the area.

Figure 5-4: Without Scheme Journey Time Route along the A585 from Windy Harbour Junction to Skippool junction

Figure 5-5: With Scheme Journey Time Route along the A585 from Windy Harbour Junction to Skippool junction

6 ROAD SAFETY

6.1 Overview

6.1.1 The safety impacts of the updated Scheme design were assessed quantitatively using details of link and junction characteristics and forecast traffic volumes and monetised and incorporated into the overall economic assessment of the Scheme.

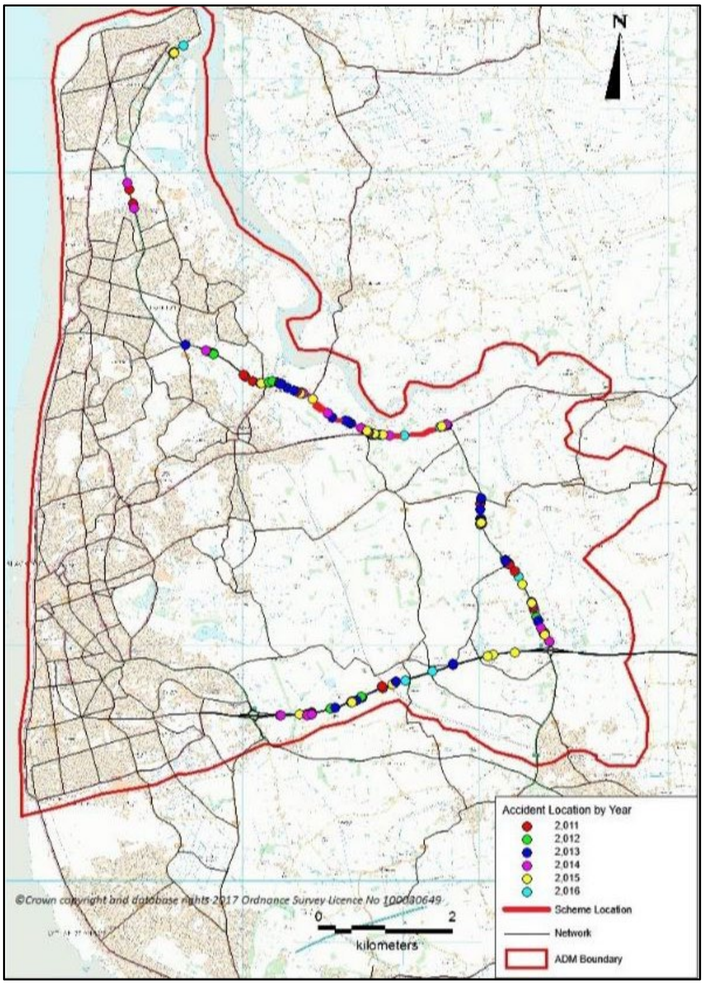
6.1.2 The Scheme Safety Assessment was undertaken in accordance with TAG Unit A4.1 Social Impact Appraisal. The accident appraisal was calculated using the Cost and Benefit to Accidents – Light Touch (COBALT) program (Version 2013.2), a spreadsheet application developed by the DfT to undertake the analysis of the impacts on accidents as part of the economic appraisal of road schemes.

6.2 Observed accident data

6.2.1 COBALT calculates the number of accidents over the Scheme appraisal period (60 years) from either default (national average) or observed (local) accident rates.

6.2.2 Observed accident rates were calculated for COBALT from Personal Injury Accident (PIA) data for the latest available complete six-year period (2011-2016). This data was obtained from the Road Safety Data website, published by the DfT Accident locations along the A585 between 2011 and 2016 are shown in Figure 6-1.

Figure 6-1: Accident locations by Year (2011-2016)



6.2.3 Local accident rates were calculated using the following steps:

- Geocoded database of road accidents on the A585 developed
- COBALT road types allocated to relevant SATURN links
- AADT 24-hour (2way) traffic flows was calculated for the SATURN link using TRIS count data
- Annual million vehicle kilometres were estimated (traffic flow * link length * 365 * 10^-6)
- Average number of accidents in the study area by link type was calculated
- Local accident rates were calculated by road type (accidents by link type per year / million veh km) and these were applied to a combined link and junction COBALT analysis.
- The local accident rates were evaluated between 2011-2016 using the observed flow data (AADT) from WebTRIS.

6.2.4 The Scheme is forecast to save 30 accidents and 120 casualties over the 60 year appraisal period. The accident and casualty savings show that the Scheme design provides improved accident and casualty reduction measures compared to the Without Scheme scenario.

6.2.5 The local accidents rates were calculated along A585 and M55 as these were the traffic count sites with available observed AADT data in the study area.

6.2.6 Table 6-1 summarises the local accident rate used in the accident appraisal compared to the default accident rate each road type and speed limit category.

Table 6-1: Accident Rates

Road Type	Speed (mph)	Default Accident Rate	Local Accident Rate
D2M	50/60/70	0.08	-
D3M	50/60/70	0.067	0.099
D4M	50/60/70	0.079	-
Modern S2 Roads	30/40	0.532	-
Modern S2 Roads	>40	0.244	0.384
Modern D2 Roads	30/40	0.553	-
Modern D2 Roads	>40	0.107	-

6.3 Accident Analysis Results

6.3.1 AADT flows for each modelled link for both Without and With Scheme for all forecast years were assessed.

6.3.2 Road types were specified as per the classification given in the COBALT manual. Table 6-2 presents the road sections along A585 categorised by COBALT road type.

Table 6-2: COBALT Road Type- A585 Windy Harbour to Skippool Improvement Scheme

Road Type	Speed(kmph)	Road Section
Modern S2	>40	1 to 7
D3 Motorway	50/60/70	8

6.3.3 The accidents saved as a result of the Scheme are calculated as the difference between the number of accidents in the Without Scheme and the With Scheme Scenarios. The number of accidents saved by the Scheme design is shown in Table 6-3.

Table 6-3: Scheme accident savings

Scenario	Total Accidents		Accidents Saved
	Without Scheme	With Scheme	
Core	15,641	15,612	30

6.3.4 The change in the number of casualties between the With Scheme and the Without Scheme scenarios is shown in Table 6-4. It is shown that there is reduction in all types of casualties i.e. fatal, serious and slight injuries over the appraisal period due to the Scheme.

Table 6-4: Scheme casualty saving

Scenario	Number of Casualties						Casualties Saved		
	Without Scheme			With Scheme					
	Fatal	Serious	Slight	Fatal	Serious	Slight	Fatal	Serious	Slight
Core	171	2,079	19,254	163	2,039	19,183	8	41	71

6.1 Summary

6.1.1 An overall objective of the Scheme, to improve safety along the route, will be achieved, as the Scheme if implemented is shown to reduce the number of accidents and casualties.

7 SUMMARY AND CONCLUSIONS

7.1.1 The existing A585 traffic flow, which is in excess of the recommended flow range of a single lane carriageway, causes congestion issues on the road network, particularly in peak periods. The congestion leads to unreliable journey times and safety impacts in the villages of Little Singleton and Skippool and surrounding areas.

7.1.2 An overall objective of the Scheme, to improve safety along the route, will be achieved, as the Scheme if implemented is shown to reduce the number of accidents and casualties.

7.1.3 The Scheme reduces severance for walkers, cyclists and horse riders and improves access across the existing A585 between the Little Singleton and Skippool junctions. Previously there were no controlled crossing points along the A585 between Skippool and Little Singleton junctions. Signalised pedestrian crossings have been introduced at Skippool, Shard Road and Little Singleton junctions. In addition the footpaths will be improved and a combined footway and cycleway will be implemented. The routes for pedestrians and cyclists will follow the existing road network rather than the bypass as this provides direct links between communities along routes with lower traffic flows. The reduced traffic flow on the de-trunked section due to the Scheme has the potential to improve the local environment along the de-trunked section and should encourage walking and cycling.

7.1.4 The impact of the A585 Windy Harbour to Skippool Improvement Scheme on the highway network is assessed by analysing the resulting changes in the travel conditions across the highway network with respect to changes in traffic flows and journey times and a reduction in delay for the Scheme compared with the Without Scheme option.

7.1.5 The largest changes in the highway flow across all modelled time periods occur on the strategic route of the A585. The Scheme benefits the long-distance traffic that uses the strategic roads of the A585 and M55 to travel between the authorities of Wyre, Fylde and Blackpool and the rest of the UK. A reduction of trips is forecast on other roads.

7.1.6 In all modelled time periods the journey times along the Scheme, seems to be reasonable i.e. the Without Scheme being the slowest with slight increases over the forecast period.

7.1.7 The Scheme improves road user journey time and reliability. Travel time savings of between 2 and 4.5 minutes per journey are forecast to be saved by road users due to the Scheme. The Scheme generates Wider Economic Impacts due to improved journey times and reliability for business road users which supports economic growth in the area.

7.1.8 The Scheme is a mostly off-line dual carriageway bypass. The Scheme has a mainline capacity of up to 41,000 vehicles per day per direction. The provision of mainline capacity is therefore in excess of the forecast traffic flow and therefore the scheme includes future provision for traffic growth in the area. The A585 mainline traffic flows is not forecast to reach capacity by the design year 2037 showing that the Scheme mainline has reserve capacity to support future development in the area.

7.1.9 The Norcross roundabout and surrounding area is predicted to become severely congested, with and without the proposed A585 Windy Harbour to Skippool Improvement Scheme. Options for improving the operation of the adjacent A585

Norcross junction are currently being considered independent of the A585 Windy Harbour to Skippool Improvement Scheme assessment by the Operations Directorate. A sensitivity test would address an otherwise possible limitation of the current Scheme appraisal in terms of assessing the chosen Scheme's resilience to improved throughput of eastbound traffic as a result of the A585 Norcross improvement scheme.

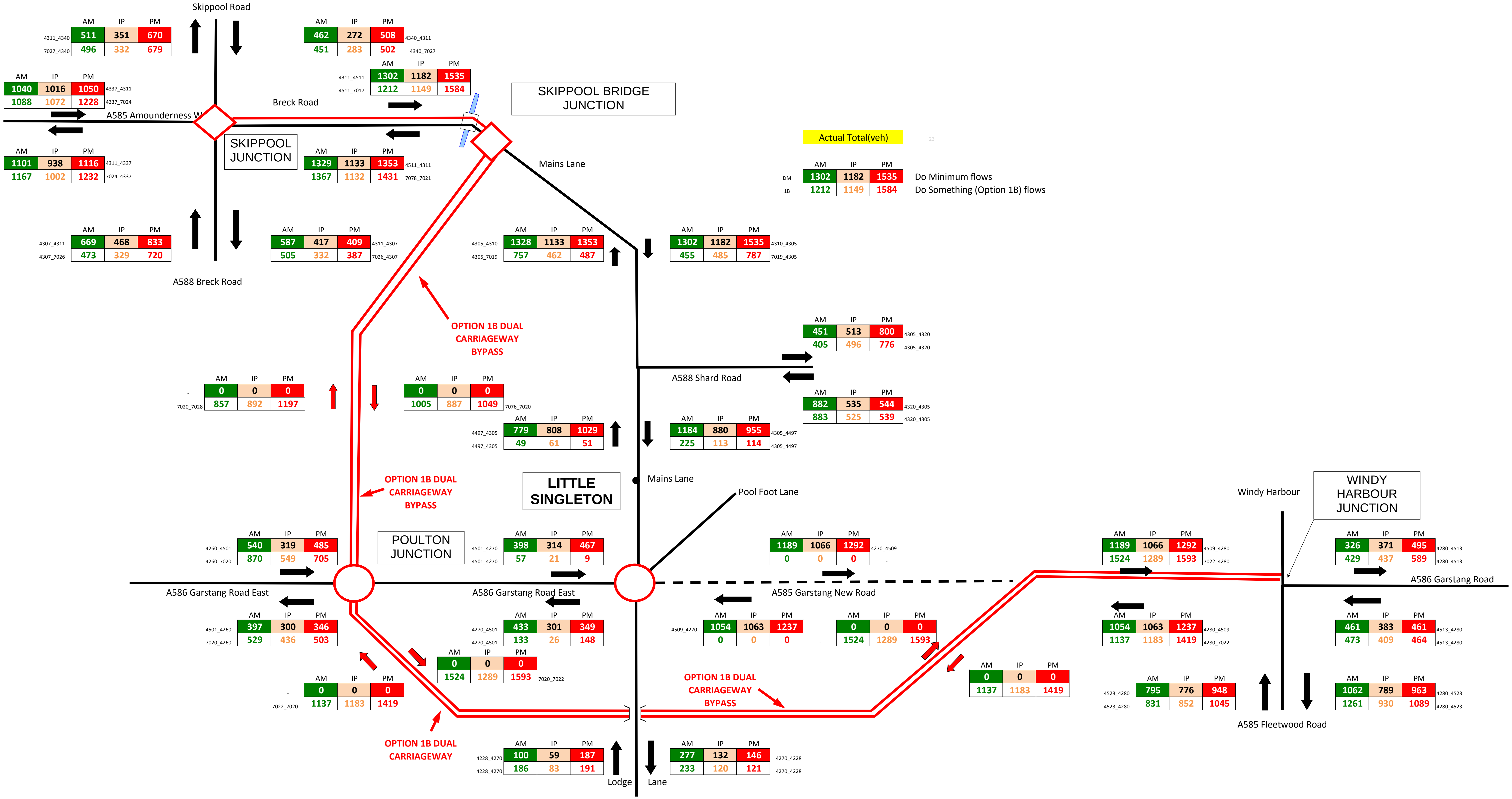
8 ABBREVIATIONS AND GLOSSARY

AADT	Average annual daily traffic
ADM	Area of detailed modelling
ATC	Automatic Traffic Count
CLHTM	Central Lancashire Highways & Transport Masterplan (CLHTM)
CJC	Classified Junction Count
COBALT	Cost and Benefit to Accidents – Light Touch (COBALT) Accident Appraisal Software
CUBE	Transport model software
DCO	Development Consent Order
DfT	Department for Transport
DIADEM	Dynamic integrated assignment and demand modelling (DIADEM) is a software tool used to set up variable demand models
DMRB	Design Manual for Roads and Bridges
EB	Eastbound
FMA	Fully Modelled Area
GEH	The GEH Statistic is a formula used in traffic engineering, traffic forecasting, and traffic modelling to compare two sets of traffic volumes
GPS	Global Positioning System
HGV	Heavy goods vehicle
ITN	Ordnance Survey Integrated Transport Network
LCC	Lancashire County Council
LGV	Light goods vehicle
LMVR	Local Model Validation Report
NB	Northbound
NTEM	Department for Transport National Trip End Model
MCC	Manual Classified Count
OS	Ordnance Survey
PCF	Highways England Project Control Framework process
pcu	passenger car units. This is a metric to allow different vehicle types within traffic flows in a traffic model to be assessed in a consistent manner. Typical pcu factors are: 1 for a car or light goods vehicle; 2 for a bus of heavy goods vehicle; 0.4 for a motorcycle; and 0.2 for a pedal cycle
PIA	Personal Injury Accident data
PWD	Preston Western Distributor is a proposed road scheme linking Preston and southern Fylde to the M55 Motorway
RSIs	Roadside interviews
SATURN	Simulation and Assignment of Traffic to Urban Road Networks, Transport model software
SB	Southbound

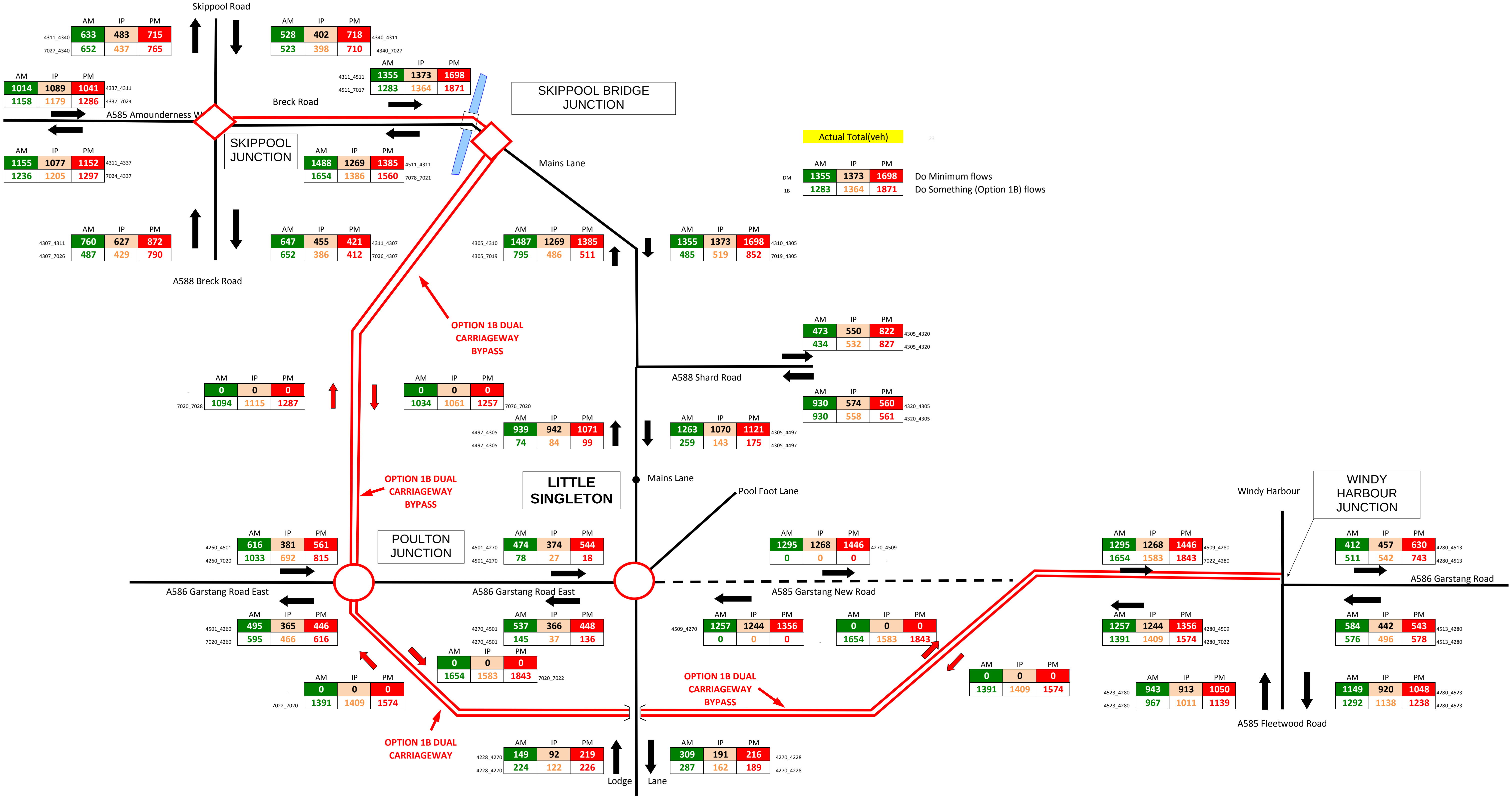
SRN	Strategic Road Network, the core road network, managed in England by Highways England
TAG	Transport Analysis Guidance: national web-based guidance document produced by the Department for Transport on appraising transport projects and proposals
TPG	The Traffic Appraisal, Modelling and Economics team within Highways England now referred to as the Transport Planning Group (TPG)
TPS RTM	Trans-Pennine South Regional Traffic Model
TRADS/TRIS	Highways England Traffic Flow Data System (holds information on traffic flows at sites on the network) now referred to as Traffic Information System (TRIS)
Trafficmaster	Trafficmaster, a division of Teletrac, owned by Danaher. Formerly known as Trafficmaster in the UK, Teletrac is one of the largest fleet companies in the UK and USA
VDM	Variable demand model (VDM) is used in transport appraisal to predict and quantify changes in demand due to a change in transport conditions
VOC	Vehicle Operating Costs
VOT	Values of Time
vph	Vehicles per hour
WB	Westbound
Without Scheme/ With Scheme	Without Scheme: The scenario where government takes the minimum amount of action necessary and is used as a benchmark in the appraisal of options With Scheme: An option that provides enhanced services by comparison to the benchmark Without Scheme scenario

Appendix A – Core Scenario Scheme Effect

Scheme Effect Core Scenario 2022



Scheme Effect Core Scenario 2037



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