A5036 Tier 1 Governance and Business Case Support

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Contents

1. Introduction 3
1.1 Scheme introduction 3
1.2 Current status 3
1.3 Purpose of report 4
1.4 A5036 Modelling Extent 5
1.5 Structure of Report 6
2. Need for traffic data 8
2.1 Scheme introduction 8
2.2 Overview of data requirements 8
2.3 Data Reports from Contributory Models 8
2.4 Use of traffic data 8
2.5 Base Year Update 9
3. Summary and review of existing data 9
3.1 Volumetric data 9
3.1.1 Summary of available data 9
3.1.2 Modelled Peak Periods 11
3.1.3 Data checking 13
3.1.4 Factoring of count data to March 2019 14
3.1.5 Vehicle classification 19
3.2 Demand Data 20
3.3 Journey Time Data 20
3.4 Signal Data 23
3.5 Geometric and operational data 26
4. Use of available traffic models 27
4.1 Trans Pennine Regional Traffic Model (TPSRTM2) 27
4.2 A5036 local area model 27
4.3 Use of TPSRTM2 and A5036 local area model 28
4.3.1 Observed Data 28
4.3.2 Network 28
4.3.3 Demand 29
5. Final volumetric and trip dataset 30
5.1 Summary of counts used in the volumetric dataset 30
5.2 A5036 2022 Traffic Surveys 31
5.3 A5036 Local area model (RPS surveys) data 32
5.4 Lancashire County Council data 33

5.5 Liverpool City Region Traffic Model counts 34
5.6 Summary of final volumetric dataset 34
6. Journey time data 35
6.1 Journey time routes 35
6.2 Observed journey time data 36
7. Port Operations 38
7.1 Introduction 38
7.2 DfT Datasets 38
7.3 Identifying HGVs by Commodity and the Port of Liverpool 38
7.3.1 Data collection 38
7.3.2 Recording the HGV data 42
7.4 Analysis of the HGV data 42
7.4.1 HGV flows 42
7.4.2 HGV type 43
7.4.3 Axle type 43
7.4.4 Commodity type 43
7.4.5 Laden status 44
7.4.6 Intermodal types 45
7.5 Observations and comments 45
7.5.1 Observations 45
7.5.2 Comments 46
8. Suitability of Accumulated Database 50
8.1 Data management 50
8.2 Summary of Adequacy of Data 50
Appendix A. A5036 2022 Traffic Surveys 51
Appendix B. A5036 Local area model dataset 54
Appendix C. Lancashire County Council dataset 57
Appendix D. Liverpool City Region Transport Model dataset 62
Appendix E. Port operations 73

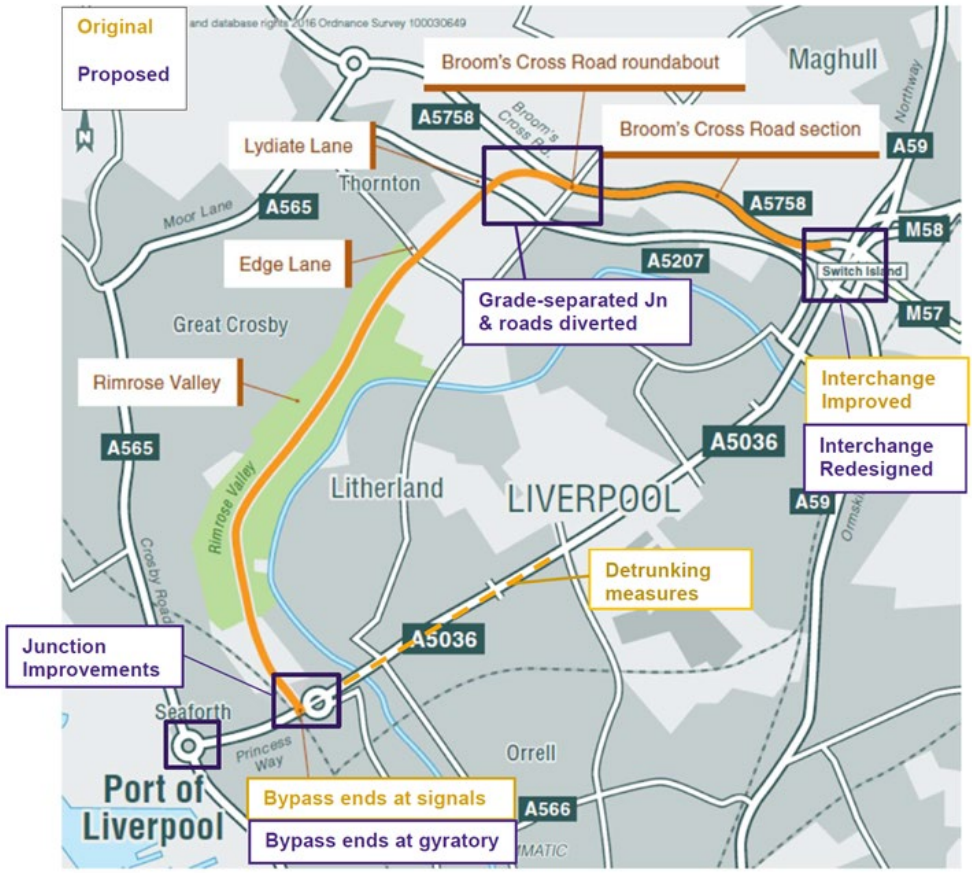
1. Introduction

1.1 Scheme introduction

The ‘A5036 Princess Way – access to the Port of Liverpool’ scheme is intended to address problems of congestion, pollution and a poor safety record on the route of the A5036 connecting the Port of Liverpool to the motorway network at Switch Island. The preferred route announced in 2017 proposes to build a new dual-carriageway road through Rimrose Valley in Sefton, connecting with Princess Way at the southern end of the existing route and Brooms Cross Road at the northern end. The PRA scheme includes upgrading Brooms Cross Road between the connection with the new road and Switch Island, and the inclusion of that section into the SRN; and the detrunking of the existing A5036 between Switch Island and the junction of the new road and Princess Way.

In 2020, a review of the scheme led to the addition of improvements to Switch Island and to the junction of Princess Way with the A565 Crosby Road South to the scope of the scheme. The enhanced preferred route is shown in Figure 1-1 below.

Figure 1-1 - Enhanced Preferred Route Announcement (PRA)



1.2 Current status

Following a review of Kier Highways’ recommendations by WSP, the scheme’s allocated Technical Assurance supplier, National Highways accepted the merits of the arguments put

forward in support of the enhanced PRA scheme, that the new road would not fully deliver against the scheme objectives without the enhancements proposed. This inevitably had cost implications, however; and a revised assured estimate produced in early 2022 concluded that the cost would be £565 million, exceeding the £500 million limit on National Highways' licence. The scheme therefore needs to transfer to Tier 1, subject to DfT and HM Treasury agreement.

The move to Tier 1 requires an up-to-date Outline Business Case (OBC). The most recent approved OBC was produced for PCF Stage 2. Since then, the transport landscape has changed significantly in respect of:

- The opening of Liverpool 2 container terminal;
- Freeport proposals in the vicinity of the scheme;
- Changing Travel Patterns catalysed by Covid 19;
- Changing patterns of short sea and deep sea trade resulting from the UK's departure from the EU; and
- Revised environmental targets.

This means that the OBC is out of date. WSP have been commissioned to update the OBC.

The analytical requirements for the update are the same as those for PCF Stage 3. The updated OBC will be used to support the scheme's passage through National Highways' IDC and IC, and DfT's IPDC. PCF Stage 3 will effectively restart at the end of that process.

1.3 Purpose of report

In order to complete the analytical requirements for PCF Stage 3, a traffic model is required to be developed. This report details the traffic data collected to support the development of the model. The model used for this scheme is an enhanced version of the National Highways' Trans Pennine South Regional Transport Model (TPSRTM2) that provides greater network and zone granularity in the area around the A5036, namely Sefton and the northern extents of Liverpool and Knowsley.

The zone and network structure in the area around the A5036 was taken from a local model that had been used to support previous PCF Stage 2 and 3 studies. This local model was developed during PCF Stage 2 by Atkins for a base year of 2015, then adapted and revalidated by RPS for Stage 3 to a new base year of 2019. This traffic model's geographical coverage concentrates on the area immediately surrounding the A5036 between the Switch Island gyratory and the Port of Liverpool.

The enhanced version of TPSRTM2, with greater network detail around the A5036, requires additional data - traffic flows, journey times and signal timings, to provide evidence of local calibration and validation around the A5036. This report details the data used for this purpose.

This Transport Data Package report is one of a series of documents that set out the scheme's traffic modelling and economic assessment. Additional documents which should be referred to for further information are:

- Appraisal Specification Report;
- Transport Model Package;
- Transport Forecasting Package;
- Economic Appraisal Package;

- Combined Modelling and Appraisal Report and
- Benefits Register.

As specified in the Appraisal Specification Report produced for PCF Stage 3, a new base year transport model for the Scheme is being produced from existing models – TPSRTM2 and local A5036 model.

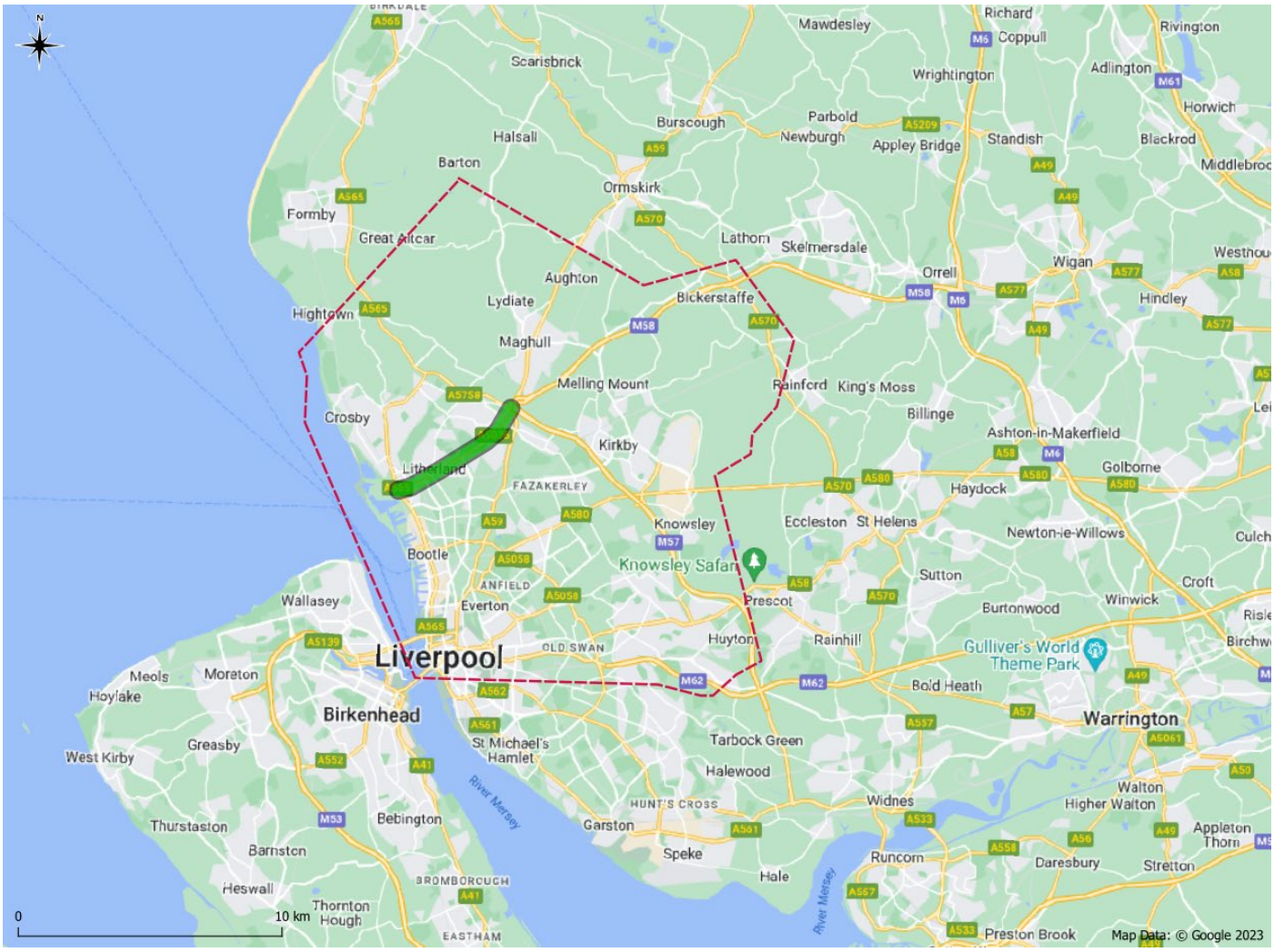
The purpose of this report is to detail the collection and initial analysis of data upon which this transport model is built. It will:

- Set out the need for traffic data taking into consideration the current PCF Stage (the Project Control Framework process) and data required for subsequent Stages;
- Collate, summarise, and review available existing traffic data.
- Describe data cleaning, expansion and checking up to the point in which it transfers to the model building process; and
- Summarise and discuss the outputs from the data collection and traffic surveys.

1.4 A5036 Modelling Extent

To gain a better appreciation of the data package, a brief introduction to the A5036 scheme area is presented. Figure 1-2 displays the location of the A5036 in relation to the major roads surrounding it such as the M58, M57, A580, M62 and M6 to the east. The current A5036 alignment is highlighted in green, the study area extent in red.

Figure 1-2 - A5036 location and study area



Further details on the Transport Model are given in the Transport Model Package.

1.5 Structure of Report

Following the introduction, the structure of this report is:

- Chapter 1 -

- Need for traffic data.
- Chapter 3 - Summary and review of existing data.
- Chapter 4 - Use of available traffic models.
- Chapter 5 - Final volumetric and trip dataset.
- Chapter 6 - Journey time data.
- Chapter 7 – Port operations.
- Chapter 8 - Suitability of Accumulated Database.
- Appendices

2. Need for traffic data

2.1 Scheme introduction

The scheme has been introduced in the section above.

2.2 Overview of data requirements

As stated in the introductory section of this report, a new transport model is under development based on the TPSRTM2 and the A5036 Local Model used to support previous PCF Stage 2 and 3 studies. The proposed model purpose is:

- To obtain a new calibrated and validated model in the A5036 scheme area;
- To predict future traffic conditions in the Do Minimum (no schemes);
- To predict future traffic conditions with the scheme (Do Something) and inform the scheme design; and
- To provide input to the economic and environmental appraisal.

To enable the development of a robust and dependable base year traffic model additional data are required. Additional data have also been collated to support other elements of scheme appraisal, such as accident data to inform the scheme's safety assessment, and environmental data to support the scheme's environmental assessment.

2.3 Data Reports from Contributory Models

The TPSRTM2 model provides comprehensive documentation in respect of data collation and treatment in respect of that specific model platform. Detail on the model data content may be found in the TPSRTM2 Model Development Report dated December 2021.

Data used in the A5036 model is reported in The A5036 Port of Liverpool Access Scheme Stage 3 Transport Data Package, February 2019.

2.4 Use of traffic data

The scheme's traffic modelling and economic assessment require several distinct types of traffic data. The key uses of the traffic data are set out in Table 2-12-1.

Table 2-1 Use of Survey Data

Type of Data	Key Uses
Volumetric data (link)	- Establish baseline link volume conditions including identification of peak hours; and determination of annualisation factors - Used in base model calibration and validation
Volumetric data (junction turning)	- An input to the development of possible operational models to assess the performance of the A5036 junctions
Vehicle classification data	- To inform the mix of vehicle types represented in the traffic model
Journey time data	- Use data for model validation of journey times along selected routes

2.5 Base Year Update

The base year of 2019 was retained as this is the base year for the TPSRTM2. Additional local calibration and validation are being conducted around the Scheme area to ensure the robustness and reliability of the updated and expanded network.

3. Summary and review of existing data

3.1 Volumetric data

3.1.1 Summary of available data

Existing traffic count (volumetric) datasets are available for use in developing the A5036 model. These are described in Table 3-1.

Table 3-1 - Existing volumetric datasets

Dataset	Date/s Survey Undertaken	Available data
A5036 2022 Traffic Surveys	November 2022 - 21 ATCs and 1 Radar count	Traffic data collected was commissioned following a data gap analysis on the network around the existing A5036 and the scheme location. This included Automatic Traffic Count (ATC) and Radar count data. Data was collected for 14 days at all sites. The following data was collected:
A5036 Local area model (RPS surveys) data	October 2019 - 9 ATCs, 3 radar counts, and 32 MCTCs January 2019 – 1 MCTC June / July 2018 – 8 ATCs, 2 Radar counts October 2017 – 4 ATCs	Traffic data was collected as part of the development of the Local area model. This included ATC, Radar counts, and Manual Classified Turning Counts (MCTC) at junctions.
Lancashire County Council counts database	September 2022 - 2 ATCs March, May, and October 2019 - 30 ATCs January, September, and November 2017 - 3 ATCs	A database of traffic count information has been made available by Lancashire County Council (LCC). The data comprises ATCs and MCTCs collected by or on behalf of the Council. The ATC data includes data recorded at both permanent and temporary sites
Liverpool City Region Traffic Model counts database	-May 2017 -September 2017 -May 2018 -2017 -2018 -2019	A database of traffic count information has been made available by Liverpool City Region. The data comprises pre-processed ATC data used in the Liverpool City Region Traffic Model (LCRTM) construction. The data represents neutral months or average annual flow in 2017, 2018 and 2019, provided as a Monday – Friday average by hour flow. There is a variety of vehicle splits given. Some counts only have data for all vehicles, some have Car and LGV separate, some have Car and LGV combined.
TPSRTM2 data	Processed to March 2019	Processed ATC data ready for use in calibration and validation. This represents March 2019, Monday – Friday average hour across peak period; AM 07:00-10:00, IP 10:00-16:00, and PM 16:00-19:00.
National Highways WebTRIS	N/A	National Highways has an extensive set of permanent monitoring sites across the Strategic Road Network (SRN) which is accessed via the WebTRIS site. These measure the volume of traffic on the network and provide continuous

database		output. This enables the derivation of robust seasonality profiles and average hourly volumes at specific sites.

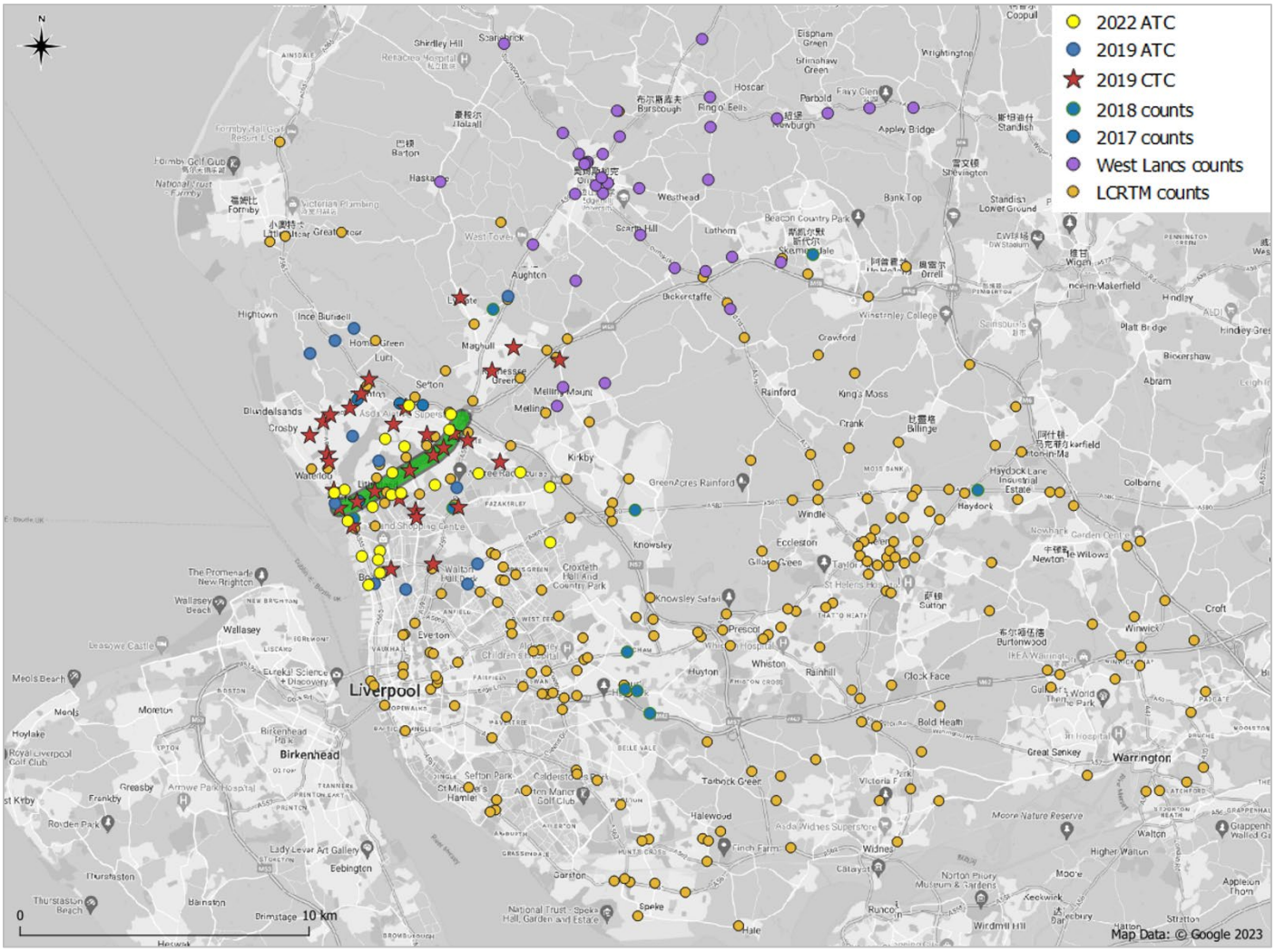
These existing datasets were reviewed to identify which data were suitable for use for this project, based on the location of the counts should be relevant to key routes that would be suitable for use in the calibration or validation of the base model.

Those counts which were suitable were selected and processed to:

- Extract data for the required model time periods
- Ensure data were checked and logical
- Factor counts to March 2019 levels
- Classify counts into modelled vehicle types; cars, LGVs and HGVs

The locations of the final set of existing counts that were processed and selected for use in the model are shown in Figure 3-1. Note that this does not include the TPSRTM2 pre-processed count data.

Figure 3-1 - Location of volumetric data processed for use in A5036 modelling



3.1.2 Modelled Peak Periods

The TPSRTM2 represents an average hour within the AM and PM peak periods (07:00-10:00 and 16:00-19:00) and the interpeak (10:00-16:00).

The RTM2 TCG Board made the decision to use these peak periods for a variety of reasons; the most significant being that, across the SRN, peak hours vary in both time and duration and so it is not possible to select a single peak hour for consideration. Datasets (including NTEM and TIS) also use these time periods and aligning the modelled time periods with these datasets was considered to be important.

Analysis of National Highways WebTRIS count data was undertaken for count sites on the A5036. This was to identify whether the average hour peak for AM and PM peak periods was applicable at a local level. Hourly flows beginning at 15-minute intervals were calculated for a neutral weekday in 2019 for four WebTRIS sites on the A5036. A neutral day is defined in DfT TAG unit M1.2 (May 2020) as “Mondays to Thursdays from March through to November (excluding August), provided adequate lighting is available, and avoiding the weeks before/after Easter, the Thursday before and all of the week of a bank holiday, and the school holidays.” The location of the WebTRIS sites is shown in Figure 3-2 and the flow at 15 min intervals is plotted in Figure 3-3.

Figure 3-2 – Location of A5036 WebTRIS count sites

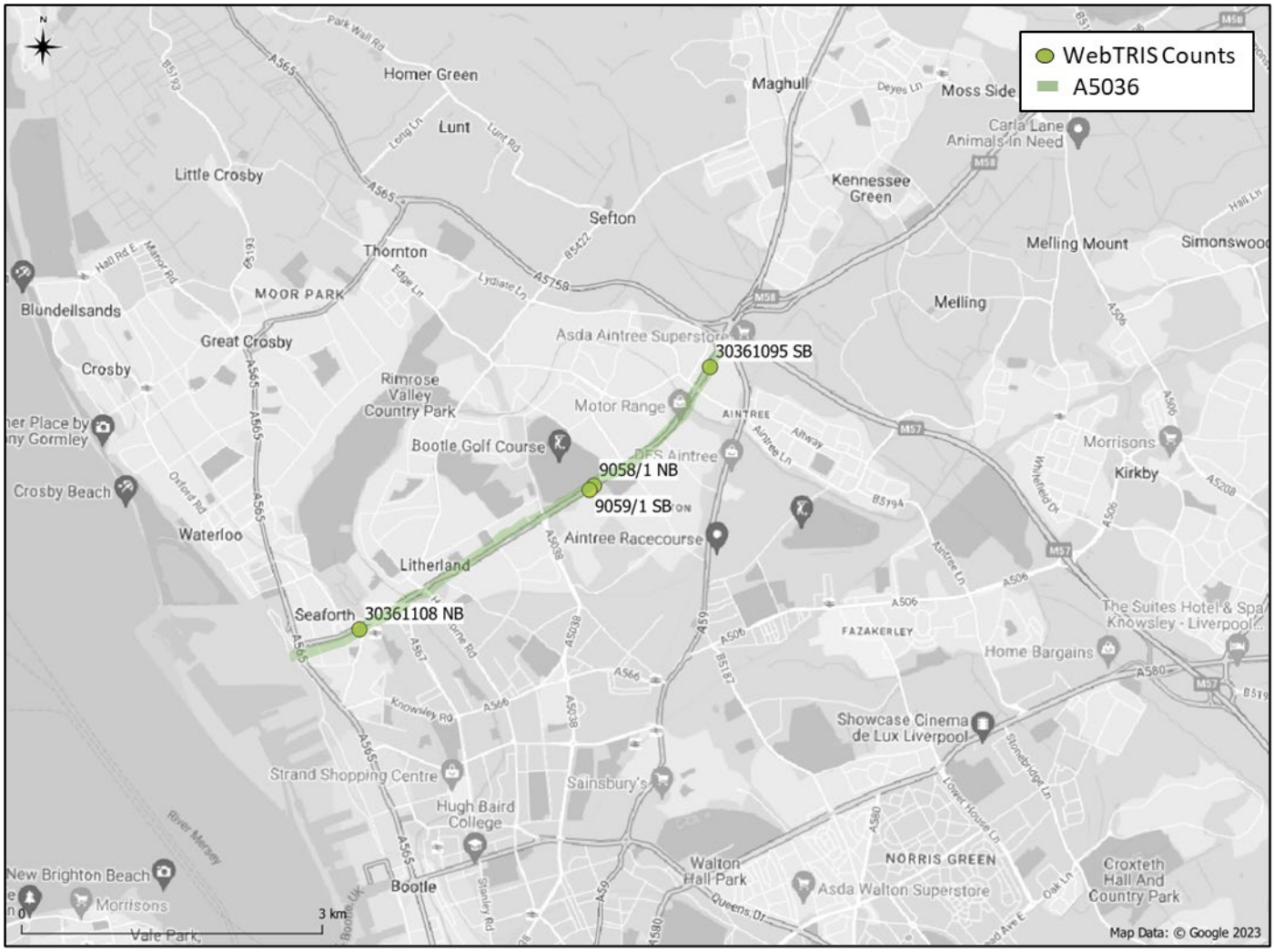
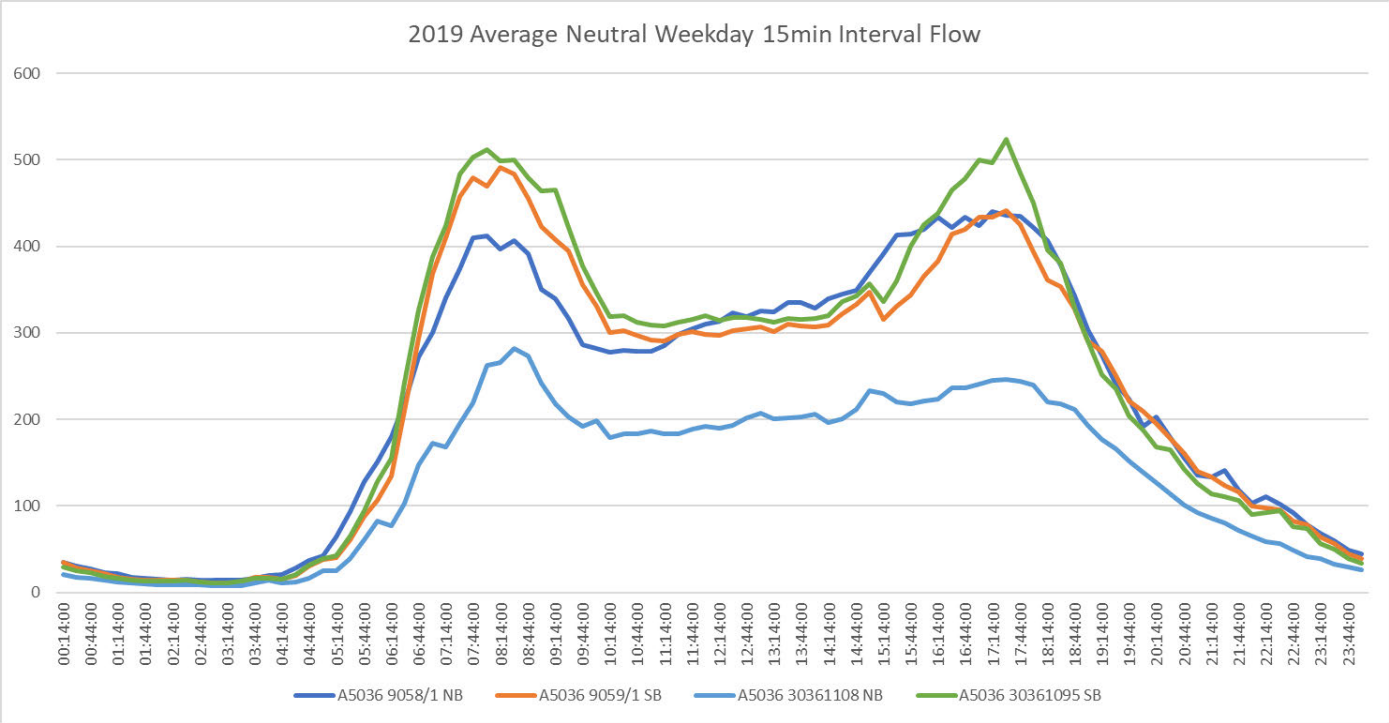


Figure 3-3 - Average 2019 neutral weekday 24-hour flow profile of 15min interval flows



The graph above shows that with the AM period (07:00-10:00) and PM period (16:00-19:00) the peak flow lasts for longer than a 60 minute period. In the AM peak southbound flows increase earlier and decrease later than northbound flows. In the PM peak northbound flows do not begin to decrease until after 18:30.

The profiles indicate that an average hour for the AM and PM peak periods is appropriate. It is noted that congestion - as measured by volume/capacity ratio and delay times - will typically be lower on the local road around the A5036 than observed during the very busiest times due to use of average peak periods.

3.1.3 Data checking

Data outliers can occur through mechanical fault including equipment failure or tampering but also in the event of traffic incidents which restrict or divert drivers and such that the resultant values are out of line with the typical daily flows recorded during the rest of the data capture period.

TAG Unit M1-2 recommends that all values outside a range of two standard deviations from the mean are considered as outliers. This calculation was undertaken for the following ATCs:

- A5036 2022 Traffic Surveys
- A5036 Local area model (RPS surveys) data
- Lancashire County Council (West Lancs) data

Any outliers were removed from the data and the average flows recalculated.

Additional checks were undertaken on the data, as follows:

- Visual checks of the count data profiled over each day were used to identify any days or part-days for which traffic data looked unusual.

- Checking for days with limited data or data which is outside of the normal trends/does not seem sensible for the time slot

During the model calibration and validation process, additional ad-hoc sense checks were also undertaken on count data. These checked that:

- The processed count data seemed appropriate for the relevant road type
- Count data seemed sensible between each time period, e.g., AM and PM peak period greater than interpeak
- Count data seemed sensible between directions, e.g., they should be broadly equal by direction across the day, certain locations will display tidality in the AM and PM peak periods)

3.1.4 Factoring of count data to March 2019

The count data was required to be adjusted to represent March 2019 traffic levels to align with the TPSRTM2. Long term traffic count data was used to calculated factors to convert the count data to March 2019 traffic flows. Long term traffic count data was taken from WebTRIS.

Count sites with good data availability (2017-2022) and in proximity to the A5036 were identified, these were:

- A5036 – 9059/1 and 9058/1
- M57 – 9060/1 and 30361656
- M62 – 8533/2 and 8535/2

Figure 3-4 - Location of WebTRIS count sites for factor derivation

The Monday to Friday average hour flow for each peak period (as defined above) was calculated for each month for Cars, LGVs and HGVs. Data recorded on bank holidays and local school holidays were removed from the analysis. The vehicle categorisations within WebTRIS are Cars defined as 0-520cm, LGVs 521-660cm, and HGVs greater than 661cm.

The distinction between car and LGV was applied to account for the growth in LGV traffic following the pandemic. The growth in LGVs calculated from WebTRIS counts was in line with the DfT Daily domestic transport use by mode - https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic.

Factors were derived by comparing the month in which the count data occurs with March 2019. Some LCRTM data did not have a month defined and as such an annual factor was derived to 2019. In addition, some LCRTM counts had car and LGV combined, in this case a combined factor was derived.

Factors are given as a proportion of March 2019 flow. In order the convert flow to March 2019 the survey flow must be divided by the factor.

Table 3-2 AM factors by vehicle type for conversion from Month to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
Jan-17	0.90	0.77	0.79	0.89	0.82
May-17	0.96	0.85	0.89	0.95	0.90
Sep-17	1.00	0.91	0.91	0.99	0.94
Oct-17	1.04	0.91	0.90	1.03	0.95
Nov-17	1.00	0.89	0.90	0.99	0.93
May-18	0.96	0.87	0.90	0.95	0.91
Jul-18	0.99	0.92	0.94	0.98	0.95
Mar-19	1.00	1.00	1.00	1.00	1.00
May-19	0.95	0.94	0.93	0.95	0.94
Jun-19	0.97	0.98	0.96	0.97	0.97
Nov-19	0.99	1.01	0.92	0.99	0.97
Sep-22	0.87	1.13	0.92	0.89	0.97
Oct-22	0.90	1.17	0.98	0.92	1.02
Nov-22	0.88	1.17	0.98	0.91	1.01

Table 3-3 AM factors by vehicle type for conversion from year annual flow to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
2017	1.00	0.89	0.94	0.99	0.94
2018	1.01	0.93	0.97	1.00	0.97
2019	1.00	1.00	1.00	1.00	1.00

Table 3-2 AM factors by vehicle type for conversion from month to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
Jan-17	0.90	0.77	0.79	0.89	0.82
May-17	0.96	0.85	0.89	0.95	0.90
Sep-17	1.00	0.91	0.91	0.99	0.94
Oct-17	1.04	0.91	0.90	1.03	0.95
Nov-17	1.00	0.89	0.90	0.99	0.93
May-18	0.96	0.87	0.90	0.95	0.91
Jul-18	0.99	0.92	0.94	0.98	0.95
Mar-19	1.00	1.00	1.00	1.00	1.00
May-19	0.95	0.94	0.93	0.95	0.94
Jun-19	0.97	0.98	0.96	0.97	0.97
Nov-19	0.99	1.01	0.92	0.99	0.97
Sep-22	0.87	1.13	0.92	0.89	0.97
Oct-22	0.90	1.17	0.98	0.92	1.02
Nov-22	0.88	1.17	0.98	0.91	1.01

Table 3-3 AM factors by vehicle type for conversion from annual flow to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
2017	1.00	0.89	0.94	0.99	0.94
2018	1.01	0.93	0.97	1.00	0.97
2019	1.00	1.00	1.00	1.00	1.00

Table 3-4 IP factors by vehicle type for conversion from month to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
Jan-17	0.92	0.82	0.84	0.91	0.86
May-17	0.95	0.84	0.91	0.94	0.90
Sep-17	0.96	0.91	0.93	0.95	0.93
Oct-17	0.98	0.91	0.91	0.97	0.93
Nov-17	0.95	0.05	0.93	0.88	0.65
May-18	0.98	0.90	0.91	0.98	0.93
Jul-18	1.01	0.95	0.97	1.00	0.98
Mar-19	1.00	1.00	1.00	1.00	1.00
May-19	0.99	0.96	0.96	0.99	0.97
Jun-19	0.99	0.98	0.98	0.99	0.98
Nov-19	1.00	1.04	0.98	1.00	1.01
Sep-22	0.96	1.13	0.90	0.97	1.00
Oct-22	0.95	1.14	0.97	0.96	1.02
Nov-22	0.97	1.17	1.00	0.98	1.05

Table 3-5 IP factors by vehicle type for conversion from annual flow to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
2017	0.96	0.80	0.92	0.95	0.90
2018	0.99	0.95	0.96	0.99	0.97
2019	1.00	1.00	1.00	1.00	1.00

Table 3-6 PM factors by vehicle type for conversion from month to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
Jan-17	0.95	0.80	0.86	0.94	0.87
May-17	0.99	0.91	1.03	0.98	0.97
Sep-17	1.02	0.98	0.99	1.02	1.00
Oct-17	1.02	0.96	1.01	1.01	1.00
Nov-17	1.00	0.96	0.97	1.00	0.98
May-18	0.99	0.95	0.98	0.99	0.98
Jul-18	1.00	1.00	0.99	1.00	1.00
Mar-19	1.00	1.00	1.00	1.00	1.00
May-19	1.01	1.01	0.99	1.01	1.01
Jun-19	0.99	1.00	0.97	0.99	0.99
Nov-19	1.01	1.05	0.98	1.01	1.01
Sep-22	0.94	1.22	0.84	0.95	1.00
Oct-22	0.96	1.24	0.90	0.98	1.04
Nov-22	0.96	1.23	0.90	0.98	1.03

Table 3-7 PM factors by vehicle type for conversion from annual flow to March 2019

Conversion Dates	Car	LGV	HGV	Car+LGV	Total
2017	0.99	0.90	0.99	0.99	0.96
2018	0.99	0.95	1.00	0.99	0.98
2019	1.00	1.00	1.00	1.00	1.00

3.1.5 Vehicle classification

The ATC data required to be processed into Car, LGV and HGV – the vehicle classes within the model. The distinction between OGV1 and OGV2 was kept to better understand the proportions and, if necessary, to inform generalised cost parameter assumptions for the model assignment. These were then be combined in the observed data to create a single observed HGV value.

The ATC data was presented in different formats, with varying vehicle classifications depending on the survey company. The data either aligned with COBA or ARX classification system. The COBA/ARX classifications applied to ATC are not dependable. Therefore, the Car/LGV/HGV splits based on the ATC classifications were compared with the splits from adjacent CTC counts, where available, and where the CTC has arm(s) of similar link classification, e.g. A road, B road etc. The identification of the CTC to use in comparison was a manual process based on professional judgement. If there were major differences in vehicle proportions, then the vehicle splits from the adjacent CTC counts should be applied to the ATC data. The comparison with CTCs was applied to the following ATCs:

- A5036 2022 Traffic Surveys
- A5036 Local area model (RPS surveys) data

The CTCs used for comparison were from the A5036 local area model (RPS survey) data dataset. ATC and CTC vehicle proportions were compared at time period level, i.e., AM peak period, Inter peak and PM peak period.

The ATCs from West Lancashire did not have any CTCs in their locality. Vehicle proportions were compared with nearby processed TPSRTM2 count data.

The LCRTM data provided a variety of vehicle proportions. The LCRTM data encompassed a large area. Vehicle proportions of LCRTM data around the A5036 and in Liverpool (west of the M57) was compared to the CTCs from the A5036 local area model (RPS survey) data. As before, identification of CTC arms of similar link characteristics was needed. Vehicle proportions of LCRTM data outside of the A5036 and Liverpool was compared to the processed TPSRTM2 count data.

3.2 Demand Data

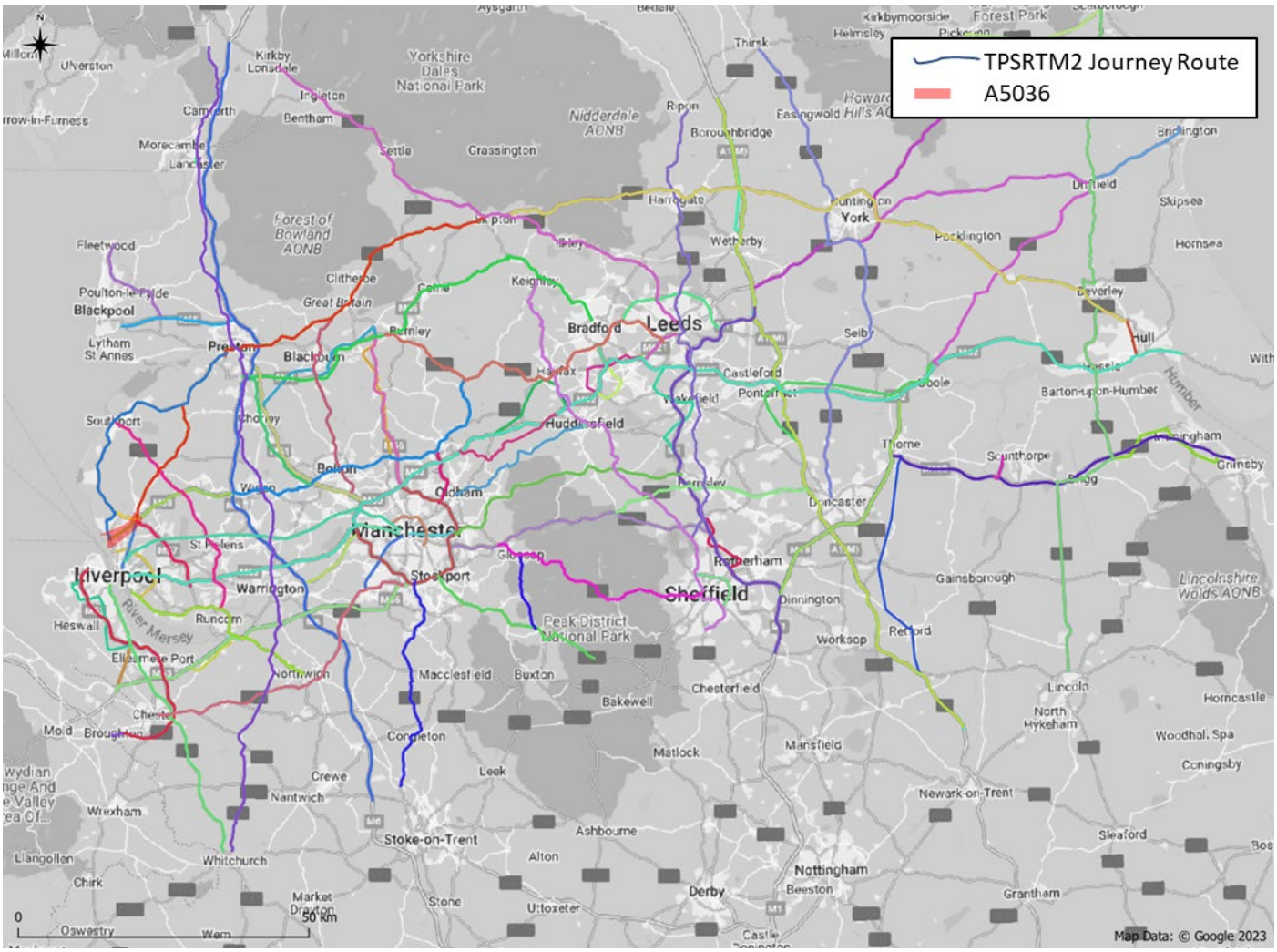
Matrix data originated from National Highways' Trans Pennine South Regional Transport Model (TPSRTM2). The TPSRTM2 has a base year of 2019 and represents Monday-Friday Peak Periods, AM 07:00-10:00, Inter peak 10:00-16:00, and PM 16:00-19:00.

Section 4 of this report provides further details on the use of TPSRTM2. Any changes to the demand are documented in the Transport Modelling Package.

3.3 Journey Time Data

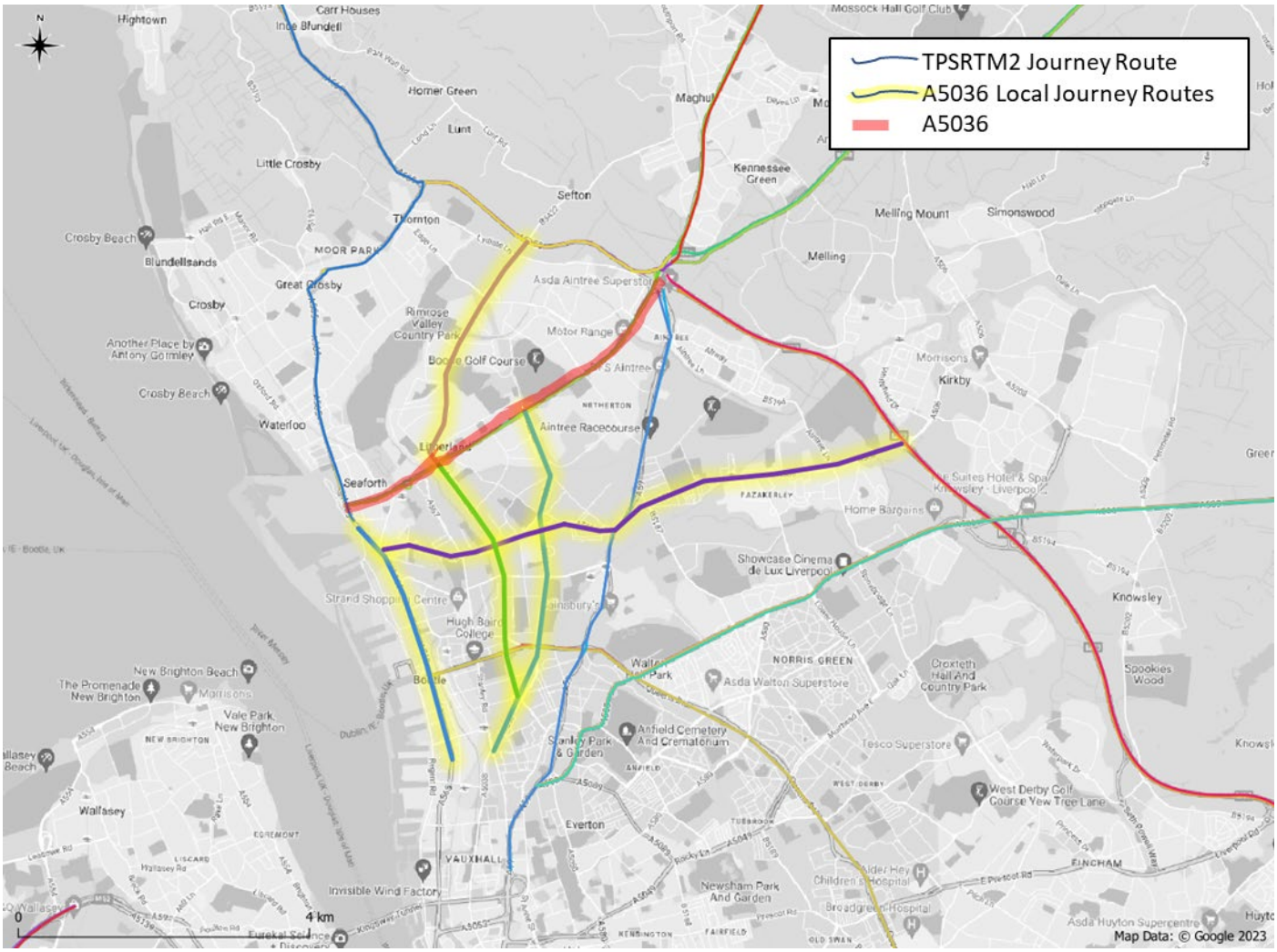
Journey time data is used to understand baseline transport conditions and for validating the new base year A5036 traffic model. The TPSRTM2 had defined a series of journey for model validation. The observed journey times were derived from data provided by the DfT purchased from Teletrac Navman containing global positioning system (GPS) derived journey times of vehicles. The data was used to calculate observed journey time data along a series of key routes. The TPSRTM2 journey routes are shown in Figure 3-5.

Figure 3-5 - TPSRTM2 Journey routes



Additional journey routes were required to provide model validation in the local area around the A5036. The observed journey times for these routes were calculated from the same dataset that had been used to calculate the TPSRTM2 journey time data. The additional local journey routes are highlighted in yellow in Figure 3-6 below. The TPSRTM2 journey routes are also shown to provide all proposed validation routes around the A5036.

Figure 3-6 – Additional Local journey time validation routes



The Teletrac Navman dataset used to derive the local journey times was the same as used in the TPSRTM2 validation. The version of the Teletrac Navman data provided was processed using a specific version of the OS MasterMap Highways Network dataset. The specific file geodatabase supplied was called 'OSHighways180410Congestion.gdb' which included various 'Roadlink' feature classes with associated 'link_ID' attributes which provided a link between the relevant road segment as a geometric feature and the associated journey time data. The data was given in aggregate 15 minute intervals, i.e. average journey time per vehicle on a specific link in a 15 minute interval.

The dataset represented March, May and June 2019 data. May and June data was added during TPSRTM2 validation to boost sample size.

The following steps were undertaken to process the data:

- Removal of Saturdays/Sundays from the dataset
- Removal of public and school holidays from the May/June dataset:
- Correction for British Summer Time
- Append a time period based on the hour of the journey start time:
    - AM 07:00-10:00 = 1

    - IP 10:00-16:00 = 2
    - PM 16:00-19:00 = 3
- Aggregation of data to:
    - OS MasterMap Highways Network link
    - Time period

All data was included in the calculated journey times meaning all vehicle classes were used. This is the same approach as used in the original RTM work.

The highest and lowest 5% journey time values for each link were removed as outliers. The median was used as the main method of calculating journey time outputs from the raw data. Additional calculations were undertaken to derive the median output standard deviation, number of counts processed, and minimum and maximum median values.

The journey times received were in 100ths of seconds and so a last step was used to convert all time values into seconds.

Section 6 provides further details on the journey time data used in the A5036 Model development.

3.4 Signal Data

The proposed model network relies on a combination of TPSRTM2 and A5036 local model network coding. Both networks represent 2019 conditions. The A5036 local model provides the detailed area around the A5036, with TPSRTM2 providing the wider network to the east beyond the M57.

There are 14 signalised junctions on the A5036 / A59 from the port entrance to just south of Maghull. The source of the timings with the A5036 local model was not well documented, and given the importance of the A5036 it was agreed with National Highways to collect signal time data for the junctions along the A5036.

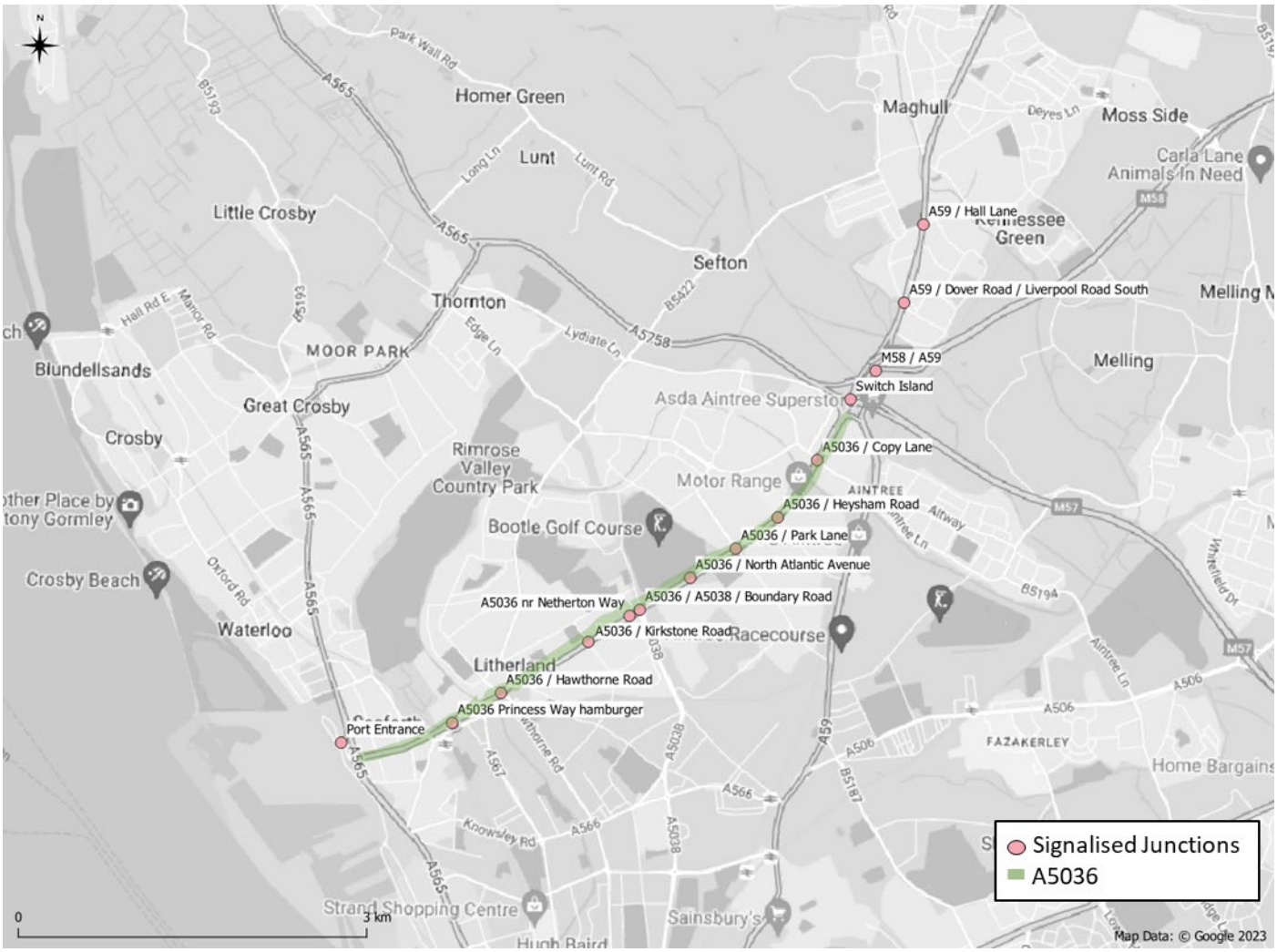
A request was made to Sefton Urban Traffic Control (UTC) for data for the following junctions shown in Table 3-83-5.

Table 3-8 - Signalised junctions data request

No.	Junction Type (J=junction, P=ped xing)	Location	Signal Controllers
1	J	Port Entrance	1
2	J	A5036 Princess Way hamburger	1
3	J	A5036 / Hawthorne Road	1
4	J	A5036 / Kirkstone Road	1
5	P	A5036 nr Netherton Way	1
6	J	A5036 / A5038 / Boundary Road	1
7	J	A5036 / North Atlantic Avenue	1
8	J	A5036 / Park Lane	1
9	J	A5036 / Heysham Road	1
10	J	A5036 / Copy Lane	1
11	J	Switch Island	4
12	J	M58 / A59	1
13	J	A59 / Dover Road / Liverpool Road South	1
14	J	A59 / Hall Lane	1

These are shown spatially in Figure 3-7.

Figure 3-7- Location of signalised junctions for data



Historic 2019 signal timings were not available. It was agreed with National Highways that current 2023 traffic conditions were relatively similar to those in 2019. Therefore current timings from 2023 could be used in the 2019 model. The data was collected on 21st February 2023. In addition to the signal timing data, the signal specification and as built drawings were also supplied for each junction.

For each junction, the green time and intergreen time were provided for each stage for a 24hr period. The data was processed as follows:

- Average green time and intergreen time for each stage over the following time periods:
  - AM 07:00-10:00
  - IP 10:00-16:00
  - PM 16:00-19:00
- Cycle time was derived from summation of the calculated green and intergreen times.
- Check of signal specification, i.e. stages and phases, aligned with network coding

At the time of writing, signal timings have been received and processed for all junctions requested with the exception of:

- Port Entrance – no signal timings provided
- Princess Way hamburger – no signal timings provided
- Park Lane junction – duplicate timings from Copy Lane provided
- Hawthorne Lane junction – no signal specification provided

The junction of A59 / Dover Road / Liverpool Road South has been reconfigured since 2019. As such the signal data provided was not used in the 2019 model but will inform the forecast networks.

3.5 Geometric and operational data

A variety of standard mapping sources are available for use under the appropriate license arrangements for scheme development and transport modelling. These include:

- Ordnance Survey (OS) Master map tiles;
- Freely available OS mapping products;
- Google Earth / Maps and Streetview and
- Bing Maps.

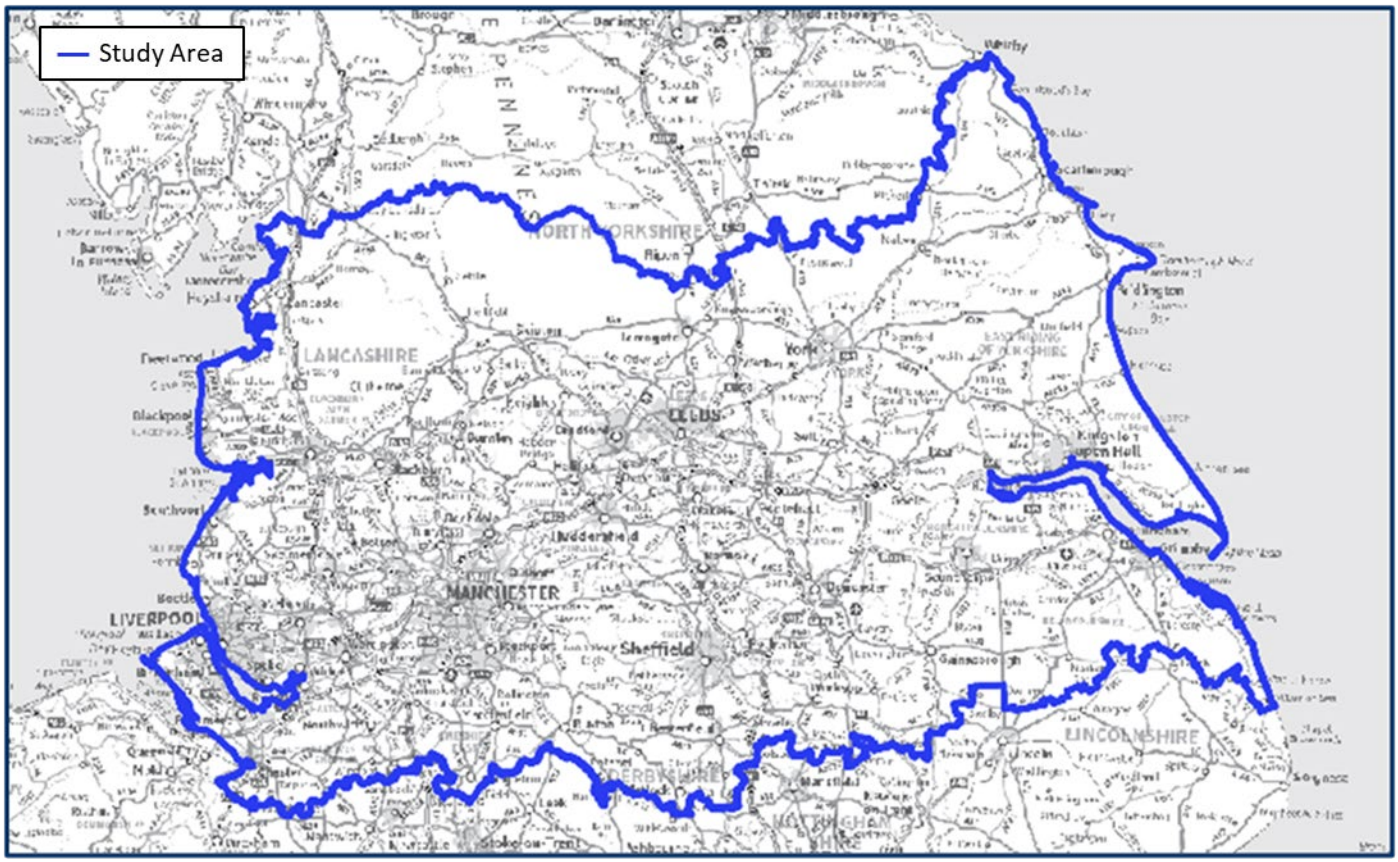
The mapping information will be used for purposes including network model building, operational assessment of junctions and reviewing the plausibility of journey routing.

4. Use of available traffic models

4.1 Trans Pennine Regional Traffic Model (TPSRTM2)

The Trans Pennine South Regional Traffic Model (TPSRTM2) is one of five RTMs that covers a specified area within England. It is a second generation RTM and was completed in early 2022. The model study area is shown in Figure 4-1.

Figure 4-1 - TPSRTM2 Study Area



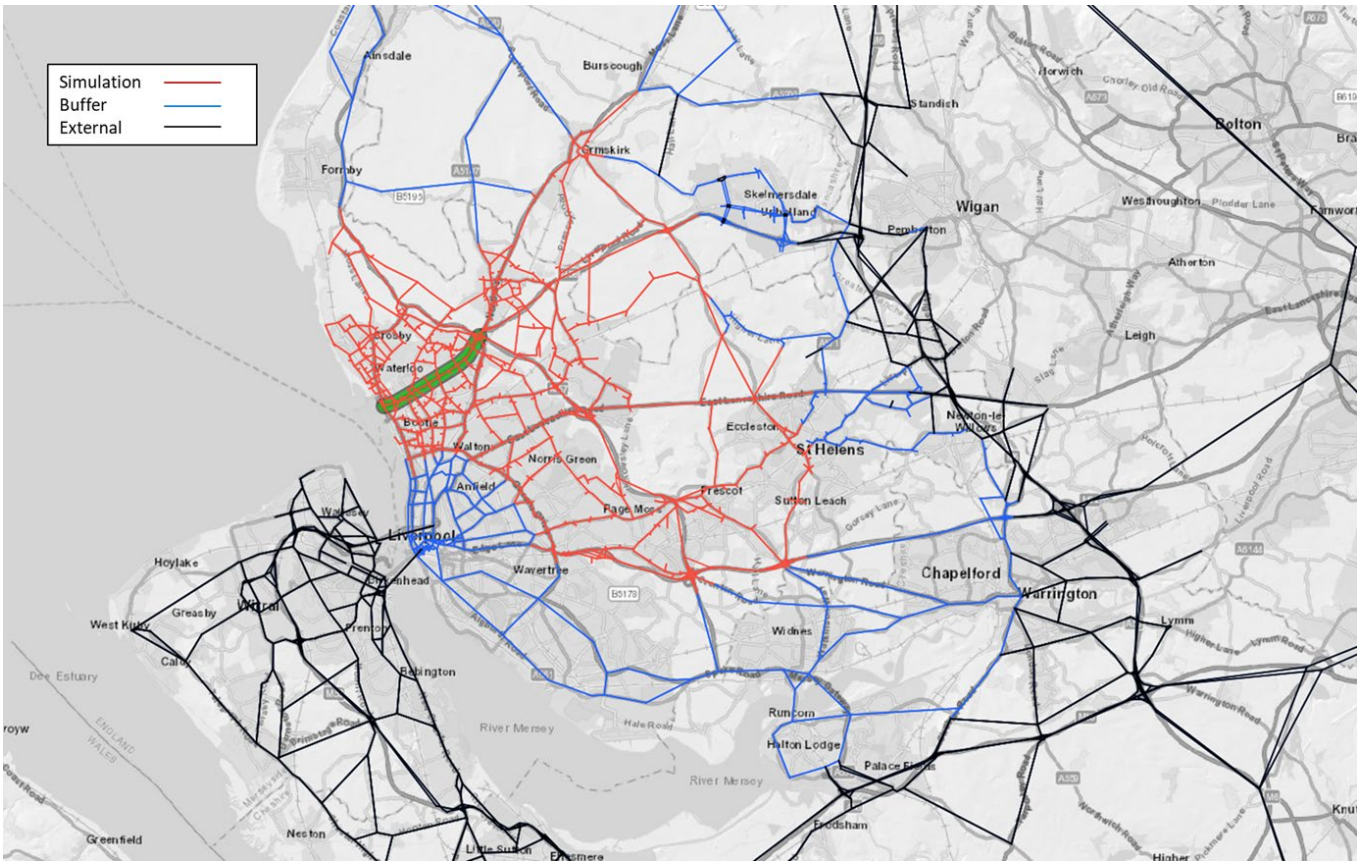
4.2 A5036 local area model

Previous modelling work has been undertaken for PCF Stage 2 (2015), PCF Stage 3 (2019) and to inform OBC (2019). The model was developed during PCF Stage 2 by Atkins for a base year of 2015. The Stage 2 base year model was adapted and revalidated by RPS for Stage 3 to a new base year of 2019. The Stage 2 base year model used the M58 Junction 1 study model as a starting point. Prior to the Stage 3 RPS Model, Arcadis also created an earlier Stage 3 update.

The traffic model's geographical coverage concentrates on the area immediately surrounding the A5036 between the Switch Island gyratory and the Port of Liverpool. The City of Liverpool and its outskirts are modelled in detail in the Stage 2 and Stage 3 models, as simulation links and junctions. The Arcadis model improves upon the Stage 2 model by changing zone connector locations and other minor changes.

The simulation, buffer and external links are shown in Figure 4-2.

Figure 4-2 - A5036 Model simulation, buffer and external links



4.3 Use of TPSRTM2 and A5036 local area model

It is proposed that the base year model is based upon the TPSRTM2 developed for National Highways in early 2022. The model is developed from 2019 data. To achieve this the model refinement process would require the following steps relating to data.

4.3.1 Observed Data

Data processing of existing and new commissioned surveys is discussed in Section 3.1. The dataset of counts and journey routes supporting TPSRTM2 is to be enhanced with local available data.

4.3.2 Network

Expansion of highway network detail for TPSRTM2 using information from the current A5036 model, with verification for accuracy. The additional network will be the local roads around the A5036. It is not envisaged to add any other links that were not previously represented within the A5036 model.

A comparison of the coding on common link and junctions between the two models will be undertaken. It is expected that the A5036 model network will provide a greater degree of accuracy that the TPSRTM2 but this will be assessed during the process. The A5036 network will adopt the saturation and speed flow relationships defined in the TPSRTM2 Coding Manual. Additional data

(aerial images, streetview, updated signal timings) will be used when required.

4.3.3 Demand

The demand will be based upon the TPSRTM2 prior matrix. This matrix will be disaggregated to a more granular zone structure in the A5036 model area. This will necessitate the redistribution of local trips using synthetic model. The public transport costs will be treated in equivalent manner to maintain linked demand model functionality.

5. Final volumetric and trip dataset

5.1 Summary of counts used in the volumetric dataset

A summary of the total number of counts for potential use in the development of the new A5036 base model is presented in Table 5-15-1. The full list of count locations and summaries of key traffic information is presented in Appendices A-D to this report. Figure 3-1 presents the locations of the complete data set.

Traffic counts have been extracted for weekday (Monday-Friday) modelled periods, factored to 2019. At this stage MCTCs have only been used for vehicle proportions. They have not been processed to provide link count data.

It should be noted that the counts presented in Table 5-15-1 are those that were made available for use in developing the base model. Not every single one of these counts will necessarily be used in the final model calibration and validation process.

Table 5-1 - Summary of Volumetric Dataset

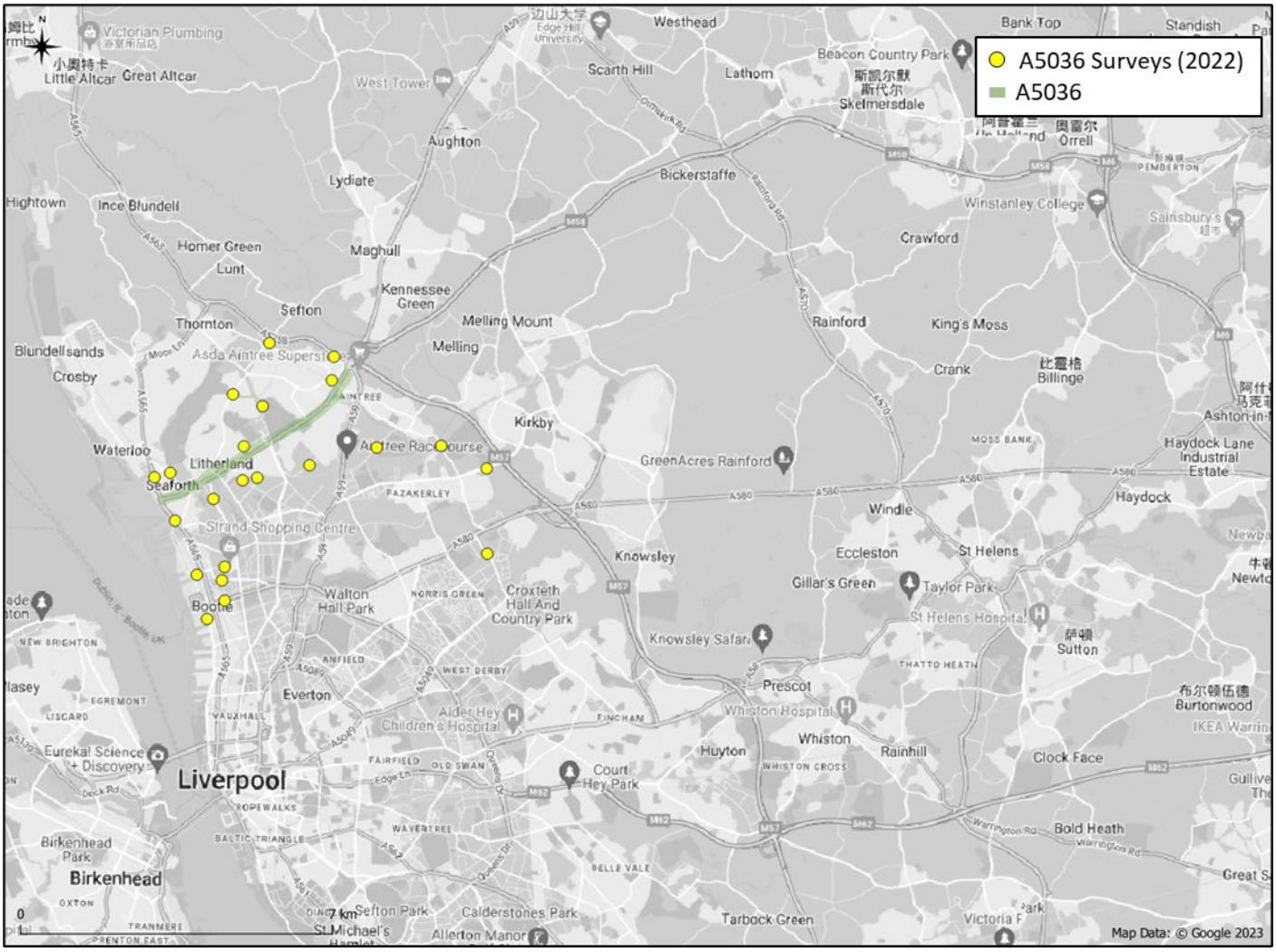
Count source	Count type	No. of surveys by collection year						Total no. of counts
		2017	2018	2019	2020	2021	2022	
TPSRTM2 Model*		0	0	916	0	0	0	916
A5036 2022 Traffic Surveys	ATC	0	0	0	0	0	22	22
A5036 Local area model (RPS surveys) data	ATC	4	10	10	0	0	0	24
Lancashire County Council counts database	ATC	3	0	30	0	0	2	35
Liverpool City Region Traffic Model counts database	ATC	92	28	7	0	0	0	127
Total no. of counts		99	38	963	0	0	24	1124

*Approximation of TPSRTM2 – dividing link counts used for calibration and validation by two

5.2 A5036 2022 Traffic Surveys

Figure 5-1 presents the locations of counts taken from the A5036 2022 Traffic Surveys dataset. The full list of count locations and summaries of key traffic information is presented in Appendix A of this report.

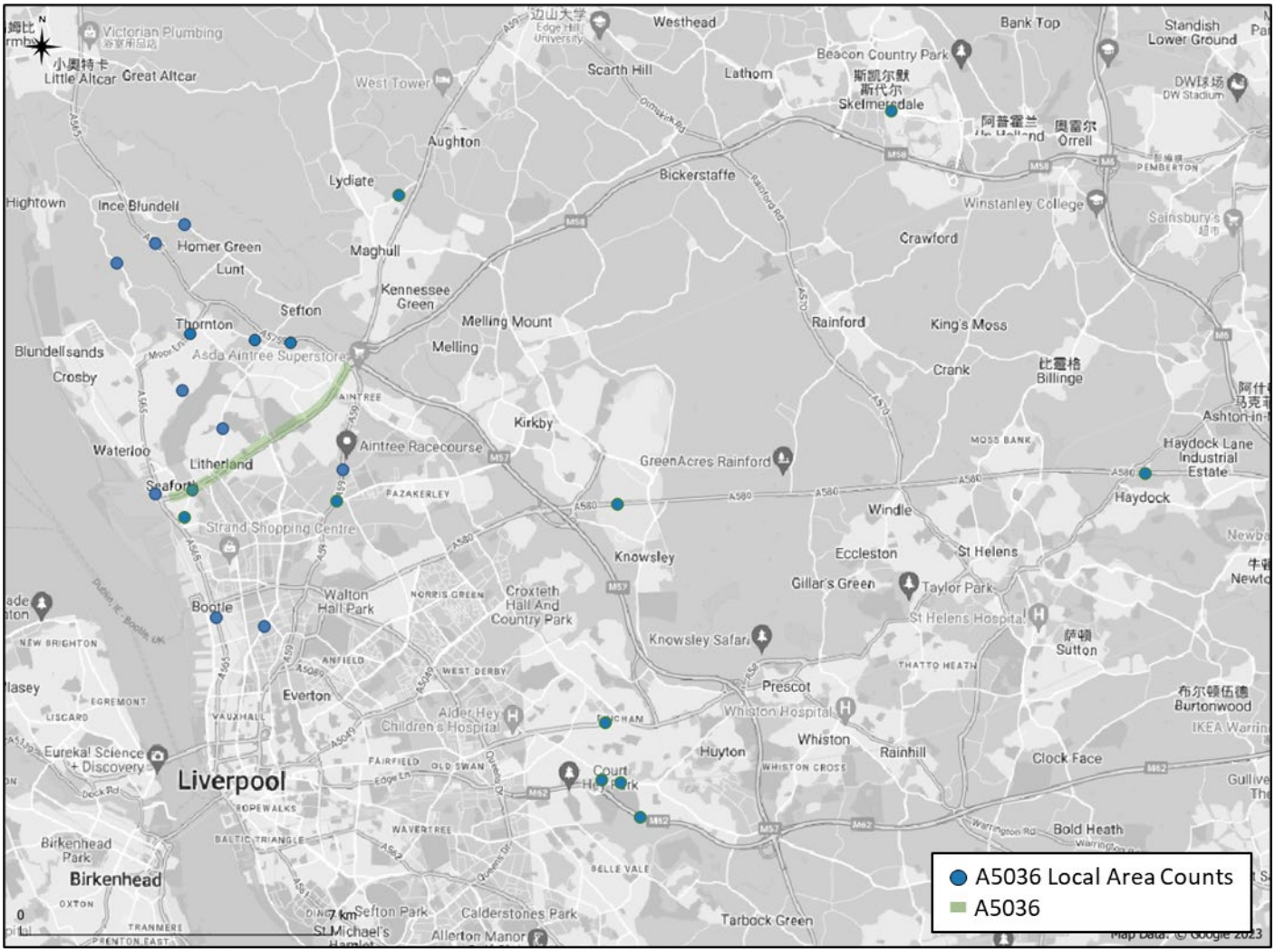
Figure 5-1 - Location plan of A5036 2022 Traffic Surveys counts



5.3 A5036 Local area model (RPS surveys) data

Figure 5-2 presents the locations of counts taken from A5036 Local area model dataset. The full list of count locations and summaries of key traffic information is presented in Appendix B of this report.

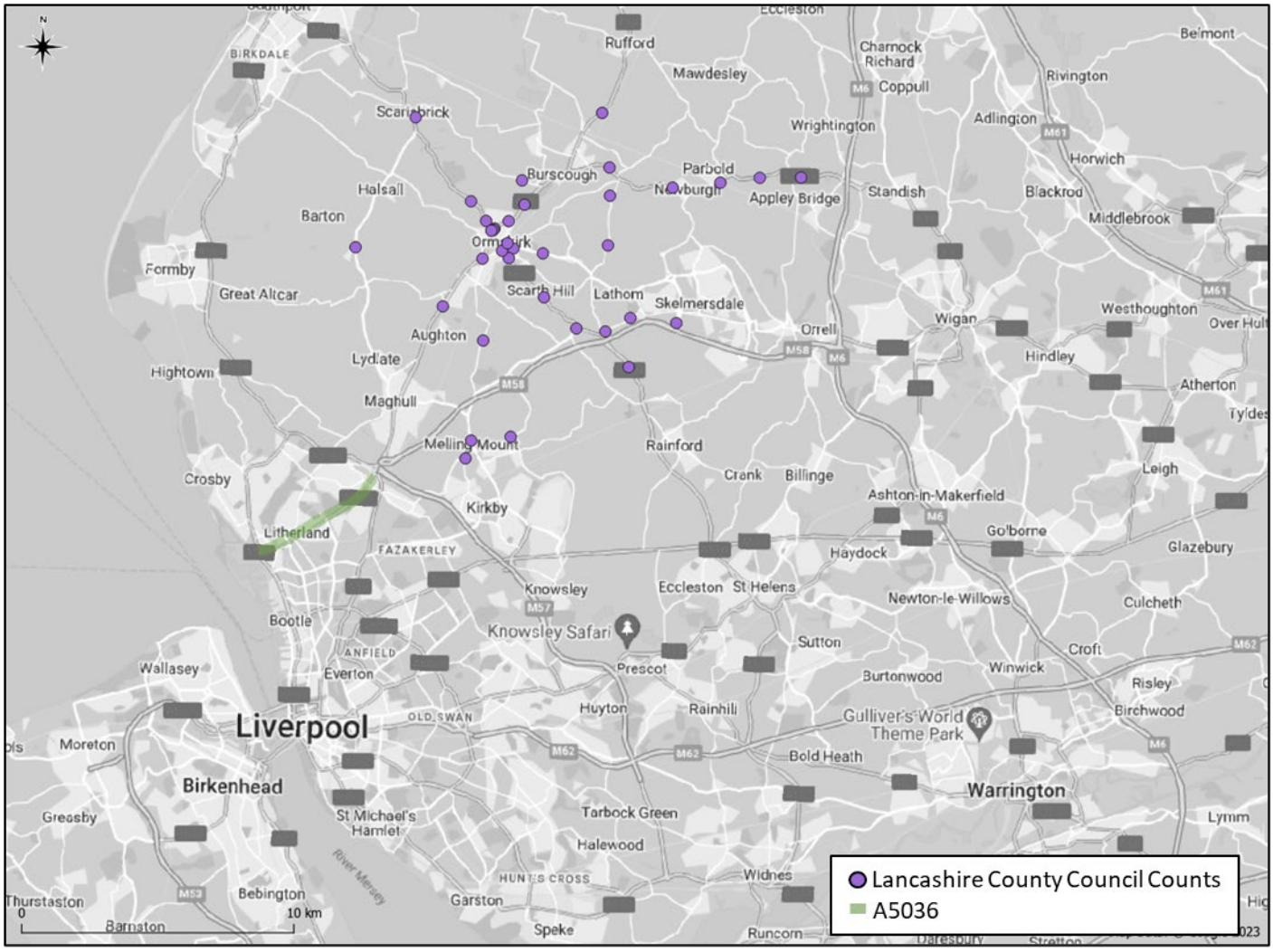
Figure 5-2 - Location plan of A5036 local area model counts



5.4 Lancashire County Council data

Figure 5-3 presents the locations of counts taken from Lancashire County Council dataset. The full list of count locations and summaries of key traffic information is presented in Appendix C of this report.

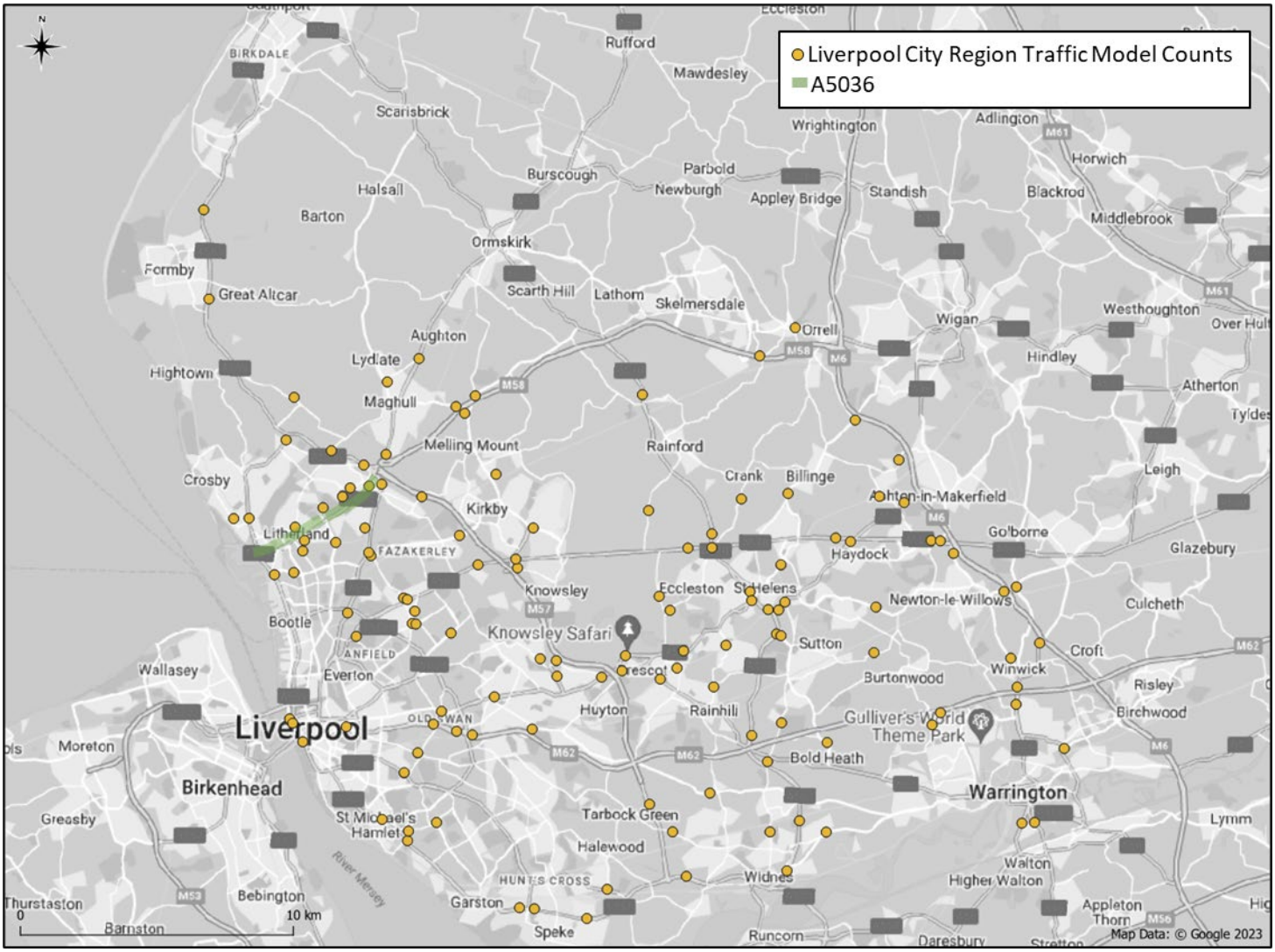
Figure 5-3 - Location plan of Lancashire County Council counts



5.5 Liverpool City Region Traffic Model counts

Figure 5-4 presents the locations of counts taken from the Liverpool City Region Traffic Model counts dataset. The full list of count locations and summaries of key traffic information is presented in Appendix D of this report.

Figure 5-4 - Location plan of Liverpool City Region Traffic Model counts



5.6 Summary of final volumetric dataset

The final set of traffic flows from each of the above-mentioned datasets are summarised in Appendices A to D of this report.

6. Journey time data

This section describes the locations of additional local journey time routes that have been analysed to establish baseline conditions to inform the transport model development. The journey time data are used to check and compare the delays and travel times calculated by the model with observed data as part of a model validation process in the local area around the A5036.

Journey time data along selected routes were obtained from Teletrac Navman. Teletrac Navman is a journey time dataset based on data gathered using satellite navigation devices installed in cars and other vehicles. Travel times are specified for links in the Integrated Transport Network (ITN). Times along a set of routes are collated by aggregating the set of ITN links along the route.

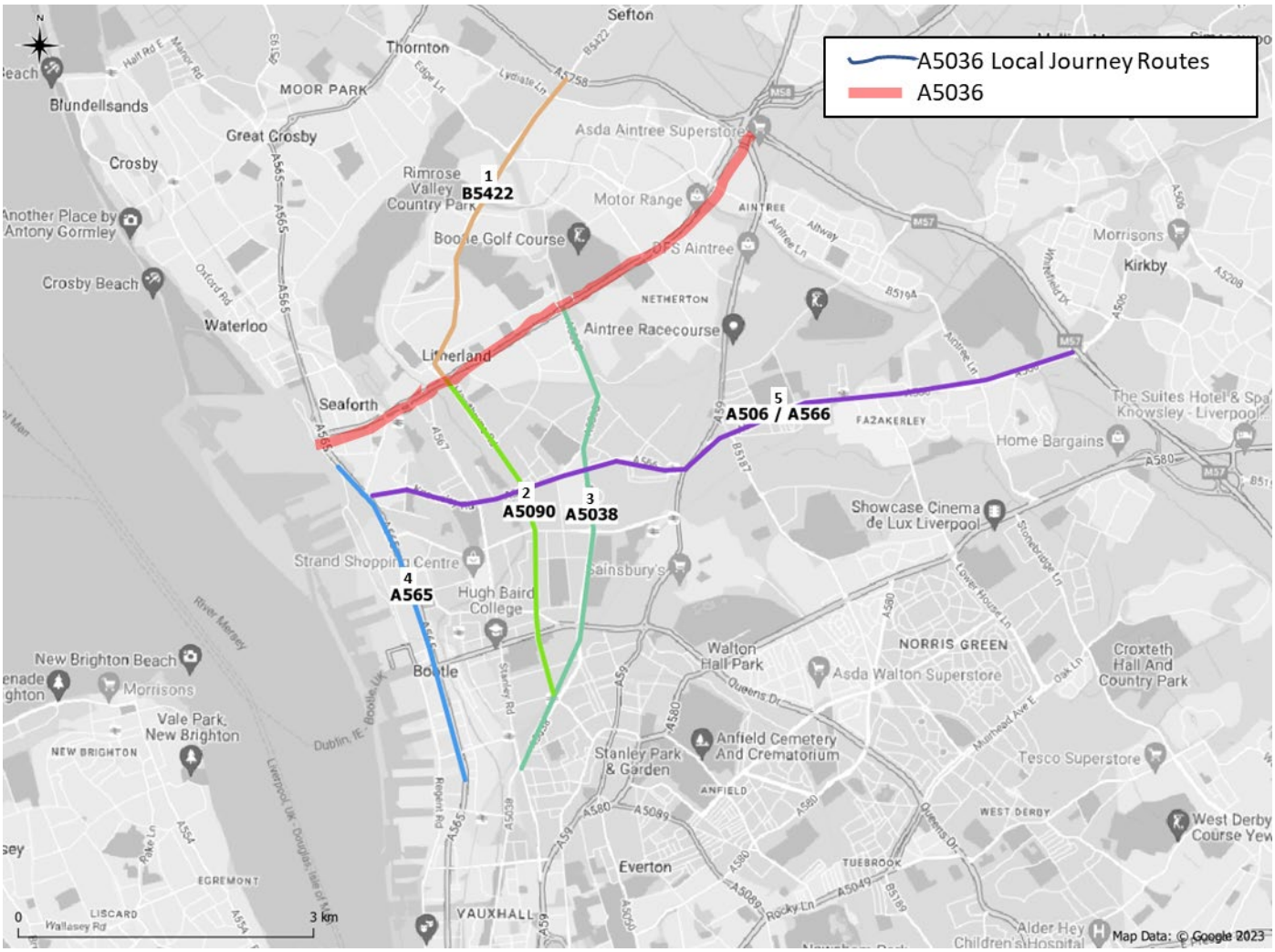
6.1 Journey time routes

A series of 5 bi-directional routes were devised as shown in Figure 6-1. The purpose of each route was to provide local validation, i.e. on links that did not form part of an existing TPSRTM2 journey route. The routes selected were:

1. B5422 from A5758 Brooms Cross Road to A5036 Church Road
2. A5090 Hawthorne Road from A5036 Church Road to A5038 Brewster Street
3. A5038 from A5036 Dunnings Bridge Road to A567 Stanley Road
4. A565 from Seaforth interchange to Studholme Street
5. A506 / A566 from M57 J6 to A565 Rimrose Road

For these 5 routes, during the validation process observed data will be compared to modelled flows to ensure the model times closely resemble those experienced on the ground.

Figure 6-1 - Local Journey time routes for model validation



6.2 Observed journey time data

Journey time data were obtained for weekdays (Monday - Friday) excluding school and bank holidays in March, May and June 2019. This is consistent with the approach used by the Regional Traffic Models. The data were obtained for the following time periods

- AM peak (average hour between 07:00-10:00)
- IP (average hour between 10:00-16:00)
- PM peak (average hour between 16:00-17:00)

A summary of journey times on each route is provided in Table *6-1*6-1. Data were processed for all routes shown in Figure 6-1. For each journey time observation, the median value of the journey time was used.

Table 6-1 - Median observed journey times

Route ID	Route Description	Direction	Length [m]	Observed journey time [mm:ss]			Speed [kph]		
				AM	IP	PM	AM	IP	PM
1	B5422	SB	3,781	07:08	06:27	07:54	31.8	35.2	28.7
		NB	3,820	07:06	06:43	08:13	32.3	34.1	27.9
2	A5090 Hawthorne Road	SB	3,605	07:20	06:15	07:05	29.5	34.6	30.5
		NB	3,600	06:15	06:26	07:09	34.5	33.6	30.2
3	A5038	SB	4,965	09:36	08:16	09:28	31.0	36.0	31.4
		NB	4,965	09:19	09:15	10:36	31.9	32.2	28.1
4	A565	SB	3,618	07:52	06:10	04:37	27.6	35.2	47.0
		NB	3,582	04:23	04:34	05:08	49.0	47.0	41.9
5	A506 / A566	EB	7,706	14:27	14:24	16:11	32.0	32.1	28.6
		WB	7,691	13:38	14:26	14:42	33.8	32.0	31.4

7. Port Operations

7.1 Introduction

The study will benefit from an understanding of port operations and volumes.

This chapter details sources of data, including DfT statistics, together with bespoke analysis of how “on the network” freight movements at the Port of Liverpool were recorded and analysed.

Details on the methodology that was proposed can be found in the appendix to the ASR.

A glossary of terms used in this chapter is provided in Appendix E.

7.2 DfT Datasets

DfT collect high level data focussed on the operation of port sites within the UK. Tabulations are focussed on the reporting of statistics including:

- Freight tonnage by year;
- Freight routes;
- Cargo types; and
- Loaded status.

The URL associated with the data is located below:

https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port

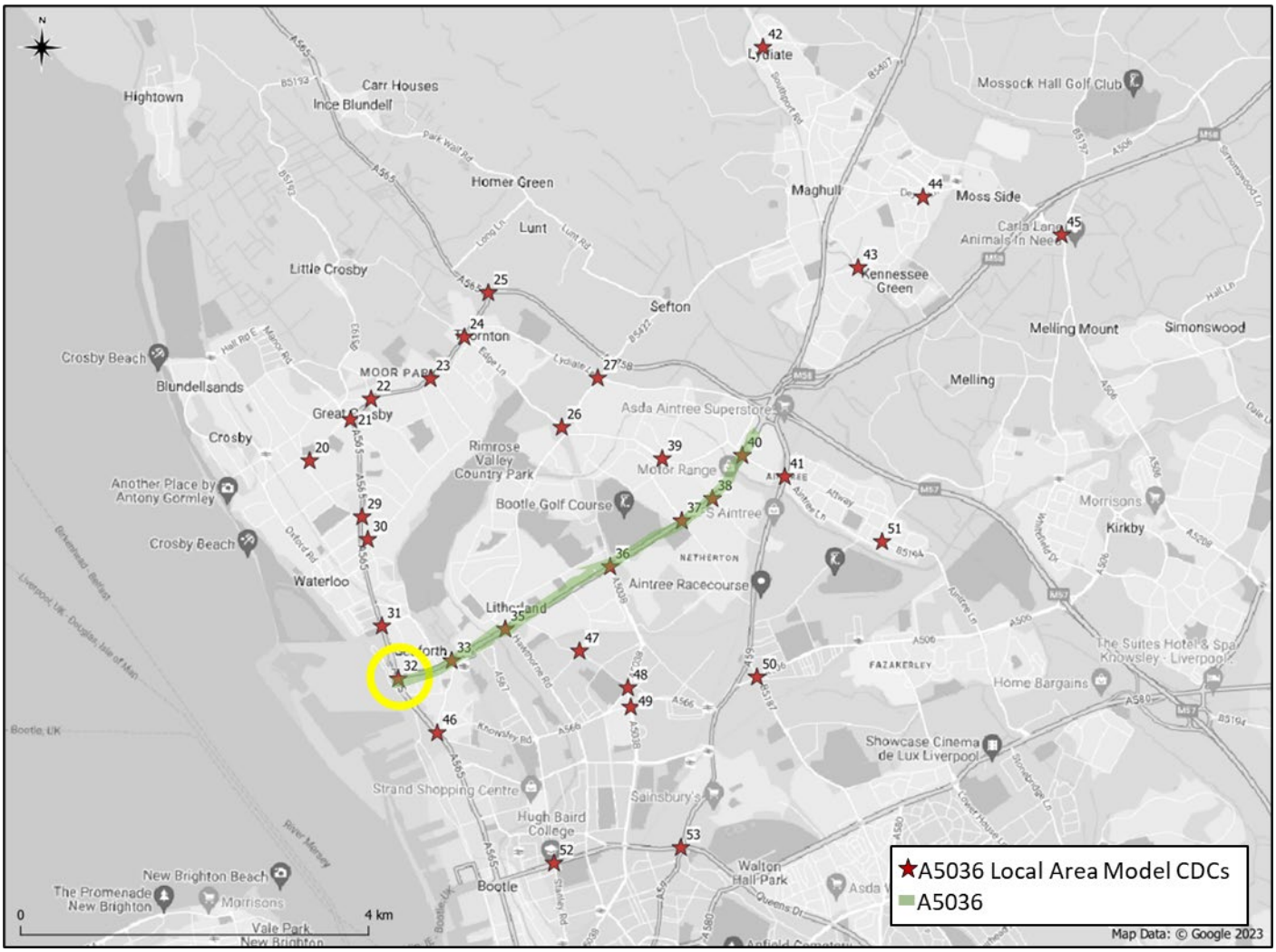
Latest datasets are provided for 2021 although 2022 data is anticipated in the near future. This data will be used to supplement existing understanding of content from GBFM and bespoke surveys.

7.3 Identifying HGVs by Commodity and the Port of Liverpool

7.3.1 Data collection

WSP received the raw video footage for the Classified Turning Counts (CTCs) from the A5036 model gathered in October 2019. The sites where data was collected are illustrated in Figure 7-1 which shows that one of the count sites (no. 32) is outside the north gate of the Port of Liverpool.

Figure 7-1 - Location plan of A5036 local area model CTCs (2019)



The CTC site at the A5036/A565 roundabout had cameras covering the various approaches and egresses at the roundabout. Reviewing the camera locations WSP was able to select the most appropriate cameras that would identify HGV traffic that is inbound to the port and outbound to the port. These are illustrated in Figure 7-2 and show that camera 5-1 observed HGVs entering the port and camera 4-2 observed HGVs leaving the port.

Figure 7-2 - CTC Camera Locations for Observing Port Gate Traffic

The view of camera 5-1 is shown in Figure 7-3 and the view of camera 4-2 in shown in Figure 7-4.

Figure 7-3 - Camera 5-1 View

Figure 7-4 - Camera 4-2 View

The video footage is taken across the days of the 13th and 14th of November in 2019 and covers the period of 07:00 to 19:00. However as it is taken from November several hours of footage is recorded in the dark with other light sources insufficient to be able to always clearly record the

relevant data. The light conditions allow for optimum data collection between 07:30 and 16:15. Weather conditions are mostly dry but there is inclement weather between 07:00 and 07:30 which adds to the difficulty in recording the observations.

7.3.2 Recording the HGV data

- The video footage was observed and WSP was able to record the following data about the HGVs:
- Direction of travel (either inbound to or outbound from the Port of Liverpool);
- Time of day (recorded in 15 minute segments);
- HGV type (either OGV1 = Rigid HGV or OGV2 = Articulated HGV);
- The number of axles (helps to indicate the size of the HGV);
- The commodity class (where possible to determine);
- Laden status (where possible to determine); and
- Number of containers carried if the HGV was the Intermodal commodity class.

A list of the data classes is provided in Appendix E.

Checks of the recorded data were made by undertaking spot checks cross referencing the recorded data with the video footage.

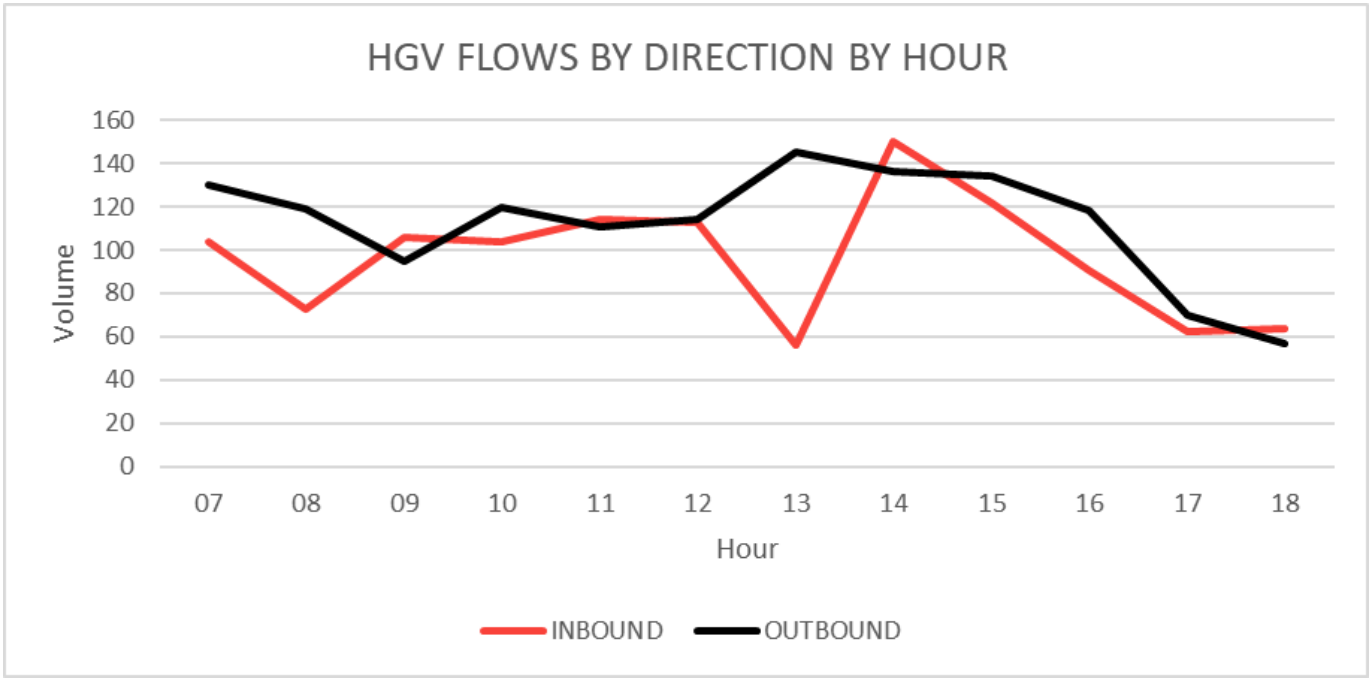
7.4 Analysis of the HGV data

The following sections provide analysis of the HGV data.

7.4.1 HGV flows

The volume of HGVs observed entering and leaving the port is shown in Figure 7-5.

Figure 7-5 - HGV flows by direction and by hour



The volume of HGVs is a similar volume for inbound and outbound HGVs. This is a similar volume between 07:00 and 16:00 after which HGV volumes decline. The decline coincides with the end of the working day.

There is a reduction in the volume of inbound HGVs at 13:00 which is due to a camera fail leading to an incomplete dataset. As such all for all further analysis the data for 13:00 (for both directions) is excluded.

The total number of inbound HGVs is 1,103 and the total number of outbound HGVs is 1,204 which is an inbound:outbound ratio of 48:52 which suggests that inbound and outbound flow volumes are balanced.

7.4.2 HGV type

The total number of HGVs by Type is displayed in Table 7-17-1.

Table 7-1 - Observed HGV types

HGV Type	Total (veh)	%
OGV1	266	12%
OGV2	2,041	88%
Total	2,307	100%

Eighty-eight percent of HGVs are the larger OGV2 type. This is due to the activities at the Port of Liverpool which are concerned with moving large volumes of materials and the largest HGVs are most suitable for this purpose.

7.4.3 Axle type

The sizes are HGVs are summarised in Table 7-27-2.

Table 7-2 - HGV type by axle

Axle Type	Total (veh)	%	Comment
6A	1,917	83%	The largest common type of HGV which can weigh a maximum of 44t GVW[1]
8W	226	10%	The largest rigid type of HGV which can weigh a maximum of 32t GVW.
All others	164	7%	
Total	2,307	100%	

In common with the HGV type, the most common observed (at 83%) Axle type is the 6A which is an OGV2. This is the largest common type of HGV at 44t GVW permitted on the highway network (without otherwise gaining further licensing or special permissions). The other most common observed (at 10%) Axle type is the 8W which is an OGV1 (Rigid). This is the largest rigid type of HGV which can weight a maximum of 32t GVW. The 6A and 8W Axle types make up 93% of all HGVs observed entering and exiting the Port of Liverpool.

7.4.4 Commodity type

Where possible the type of commodity sector that the HGV was operating in was recorded. The results are displayed in Table 7-37-3 which shows the top five commodities observed.

[1] GVW = Gross Vehicle Weight

Table 7-3 - Observed commodity types

Commodity Type	Total (veh)	%
Intermodal	1,170	51%
RoRo[2]	313	14%
Grain	299	13%
Aggregate	205	9%
Chemical	112	5%
Other	208	9%
Total	2,307	100%

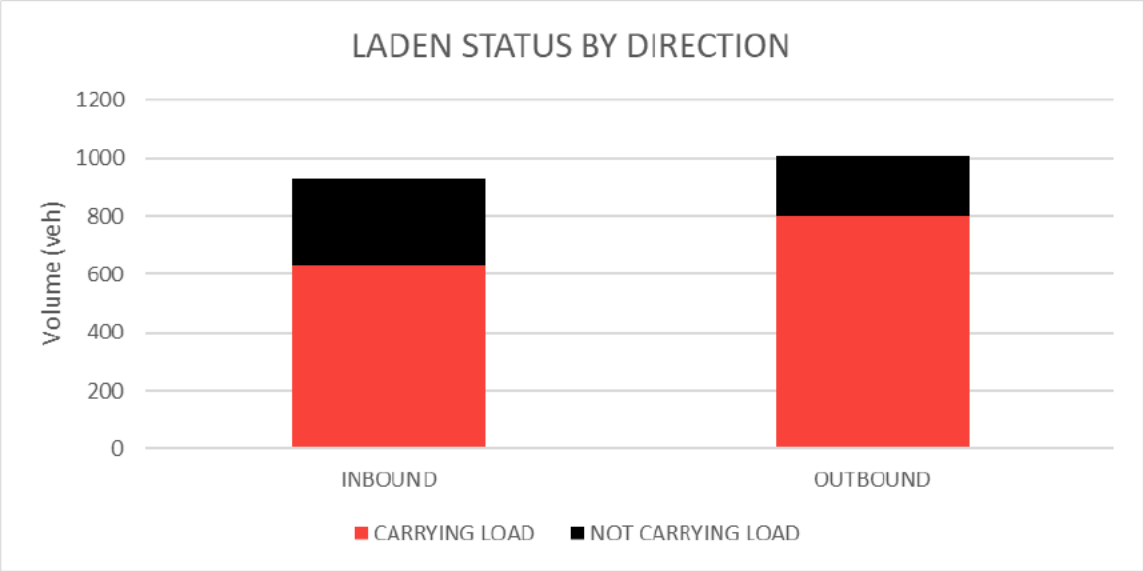
The top five commodity types are all commodities that have a significant presence at the Port of Liverpool. The most populous is intermodal which is reflective of the large container terminals at Liverpool. The top five commodities make up 91% of all HGVs observed.

For most commodities, the inbound and outbound flow volumes are similar. This is not the case for HGVs carrying grains with twice as many leaving the Port of Liverpool by the Seaforth Gate as entering. This suggests that grain HGVs are entering via another point of entry (such as at Strand Road) and travelling within the Port itself.

7.4.5 Laden status

The laden status of each HGV was observed. The results are displayed in Figure 7-6.

Figure 7-6 - HGV laden status by direction



The laden status of HGVs shows that while the inbound and outbound flow volumes are similar, a higher proportion of HGVs carrying a load leave the Port of Liverpool than enter. When one

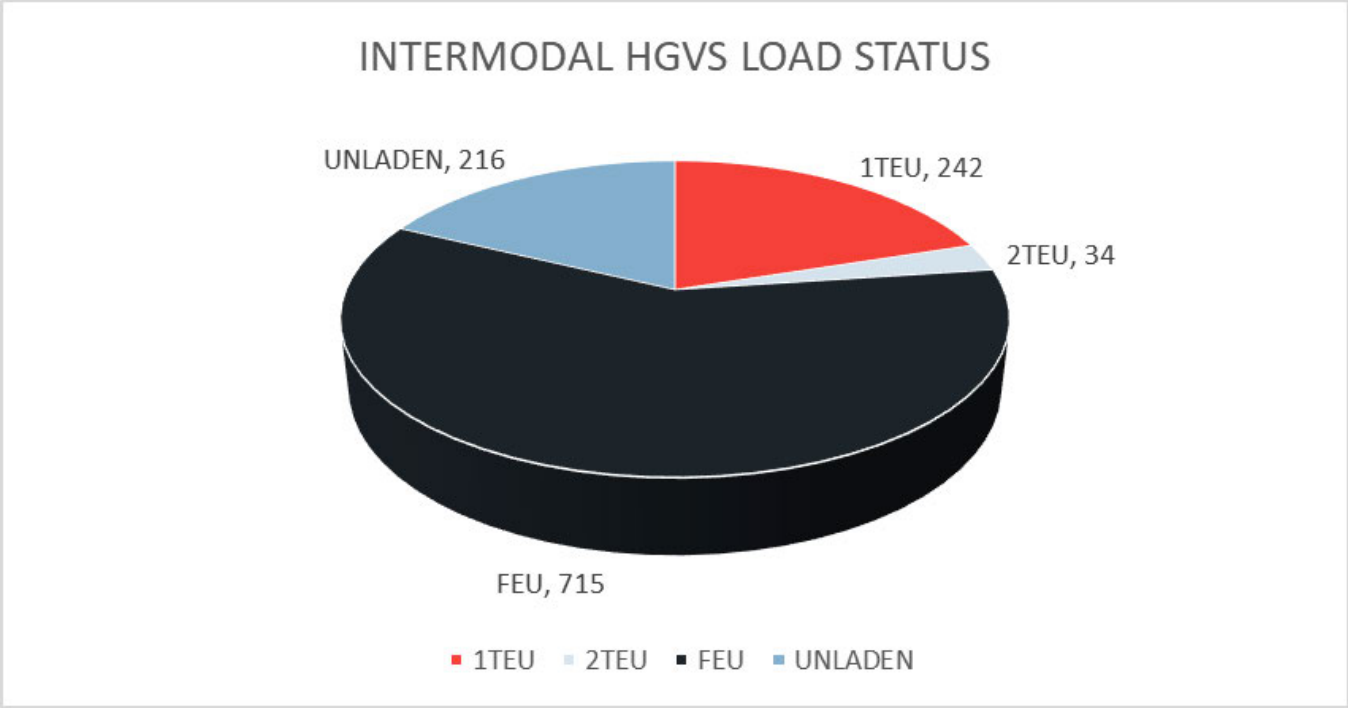
[2] This has been estimated based sum of the total number of Roll on Roll off identified HGVs, curtainside HGVs and HGVs with no trailer. It is thought that most curtainside HGVs will be related to RoRo activity as the other major commodities handled at the Port of Liverpool require specific trailer types. HGVs with no trailer are likely to be involved in RoRo as they will more than likely be either collecting or have dropped off an unaccompanied trailer at the RoRo terminal.

considers the balance of UK goods trade volumes where the UK imports more than it exports the trend observed from the data makes sense. When considering all HGV movements (regardless of direction), 74% of HGVs were observed carrying a load compared to 26% of HGVs not carrying a load. This compares to about 30% of all HGVs according to Department for Transport statistics.

7.4.6 Intermodal types

The laden status of intermodal HGVs is shown in Figure 7-7.

Figure 7-7 - Intermodal HGVs load status



The chart above shows that 59% of intermodal HGVs are carrying forty foot containers which are the largest of the most common container types. Twenty percent are carrying a single twenty foot container with only 3% carrying two twenty foot containers (which is possible on an intermodal skeletal trailer). Eighteen percent of intermodal HGVs were unladen which is below the average figure observed across the whole dataset.

7.5 Observations and comments

The analysis of the recorded freight data has revealed the following observations.

7.5.1 Observations

- The balance of entries and exits from the Seaforth Gate are similar – following the adage of what goes in, must come out.
- The largest HGV types are used in moving goods into and out of the Port.
- The most common commodity types observed are all commodities handled by the Port. This is unsurprising. These are also commodity types that have terminals close to the Seaforth Gate. Based on internet based research the commodity terminals are shown in Figure 7-8
- It is estimated that 74% of all HGVs are carrying a load and that proportion rises to 82% for HGVs carrying intermodal containers.

Figure 7-8 - Terminal locations by commodity type

7.5.2 Comments

This analysis covered just the Seaforth Gate. Given that the Port of Liverpool is a large site running alongside the River Mersey it is highly likely that certain commodity HGVs are using specific gates to access and exit the Port. This is suspected as while HGVs carrying scrap metal were observed they were only a limited number. Given that the scrap metal terminals are located closer to other Port Gates it is highly likely that HGVs involved in scrap metal are using the other Port Gates.

Having cameras that covered the inbound and outbound HGV movements at other Port Gates would increase the value of the Freight Data Exercise.

Grain and Aggregate HGVs can look quite similar to each other however the WSP team was able to identify subtle differences which allowed for the identification of these commodity types. The differences are:

- Name of the haulier – quite often a HGV will have the name of the haulier and/or the type of commodity the haulier specialises in transporting. An internet search of the haulier name can also help confirm the commodity type;
- The rear of the trailer – will bulk grain and aggregate trailers are both tipper types, the hinged flap at the rear of the trailer can help to determine whether the trailer is designed to carry grains or aggregates. A grain trailer will have a much smaller chute whereas an aggregate tailer flap will be hinged across the width of the trailer. Examples of grain and aggregate trailers are shown in Figure 7-9 and Figure 7-10 respectively; and
- The cleanliness of the trailer – the least dependable method of determination compared to the two described above, aggregate trailers will often go off road into quarries and onto building sites which lends them to getting quite dirty which is while an untidy sight is not of huge concern to the haulier. However a grain trailer that is not kept clean will fall foul of health and safety requirements and could lead to the rejection of a load as such grain trailers will have a satisfactory level of cleanliness.

Figure 7-9 - Rear of grain trailer

Figure 7-10 - Rear of an aggregate trailer

With respect to biomass the major user of biomass in England is Drax Power Station that burns biomass pellets. Some biomass pellets are imported from North America and these imports would logically enter England via the Port of Liverpool. However the impact of this commodity on the highway network is not clear as much of the biomass is transported by rail. According to Drax's website approximately fourteen trains arrive every day from the ports of Liverpool, Tyne, Immingham and Hull delivering up to 20,000 tonnes. Rail is most economical when it is transporting large homogenous volumes at rail connected sites, which both the Port of Liverpool and the Power Station are.

Figure 7-11 - A Drax biomass train

8. Suitability of Accumulated Database

8.1 Data management

Traffic data from various sources have been collated to inform the modification of a transport model to provide local calibration and validation in support of the A5036 Princess Way / Port of Liverpool access scheme.

Where possible, all data collection sites are referenced by the originator's assigned site IDs and locations. However, newly collected data has new site IDs and file identifiers assigned.

Quality checks have been applied to the data during the processing stage before exporting to the model building process, as discussed throughout this report. This ensures consistency and accuracy throughout the model building process, and for subsequent use in the processing of model outputs.

8.2 Summary of Adequacy of Data

This report has identified and described the review of traffic survey data previously collected and collated to assess and quantify baseline conditions for model development.

The traffic data collated for this study have been obtained from credible sources. A process of data filtering and checking has been implemented to confirm the suitability of traffic data provided for the study purposes.

The Teletrac Navman data is commonly used for transport model development purposes across the UK and is considered the most appropriate source of journey time data.

Further port operational data has been collected to support and inform elements of scheme modelling and appraisal.

Overall, it is considered that the data collected as part of the A5036 model development forms a suitable and comprehensive database. It is sufficiently detailed to establish principal traffic movements and characteristics along the A5036 corridor and surrounding area.

Appendix A. A5036 2022 Traffic Surveys

Figure 8-1 - Location plan of A5036 2022 Traffic Surveys dataset with site IDs shown.

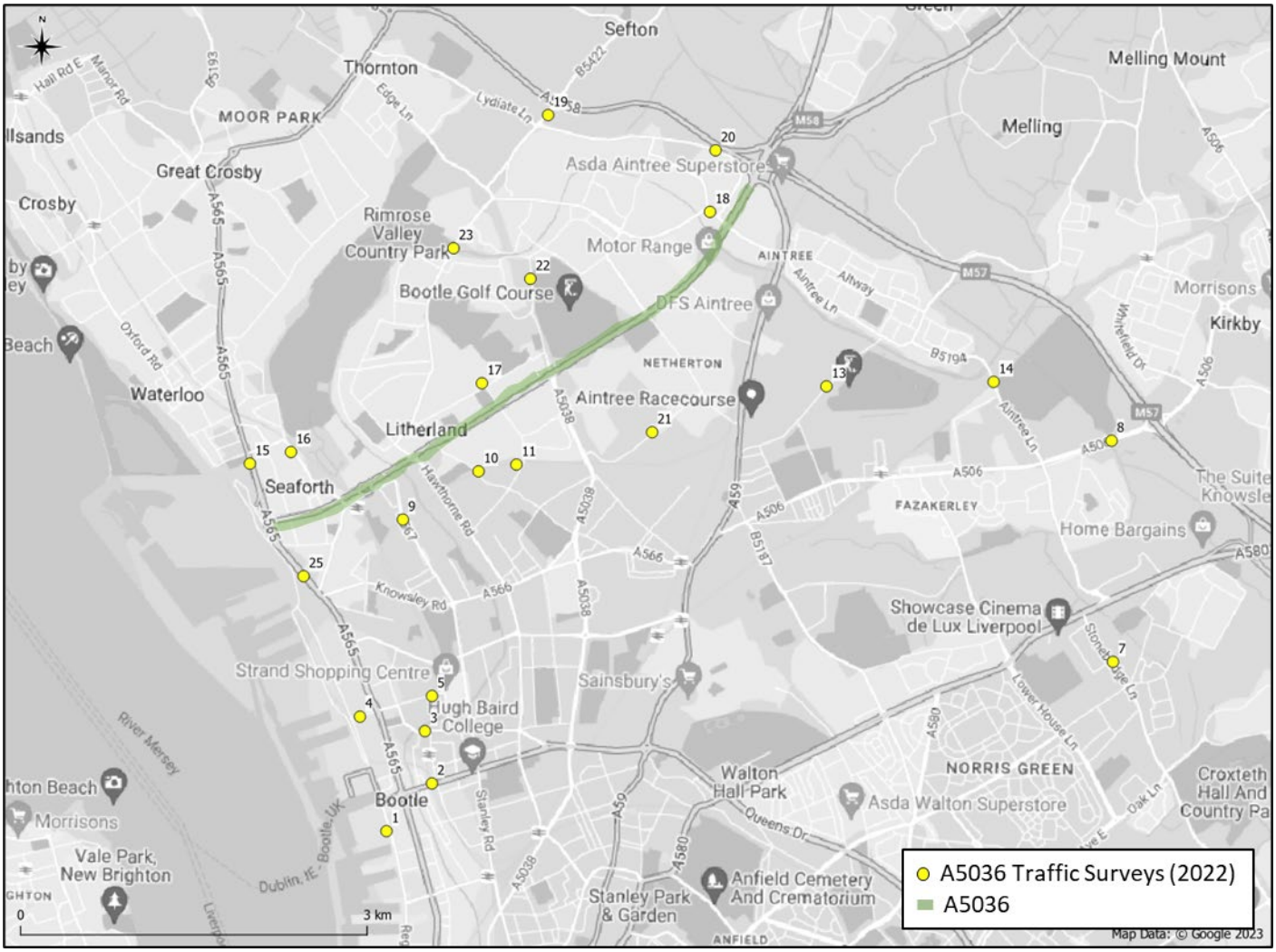


Table 8-1 Observed Flows (veh/hr) at A5036 2022 Traffic Survey count sites (Car,LGV,HGV)

CountID	Location	Date	Count Direction	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
1	Regent Road, south of Raleigh Street	11-2022	NB	351	20	26	397	286	20	25	331	222	8	12	242
			SB	206	19	23	249	302	26	28	355	428	19	14	462
2	A5058 Millers Bridge, west of Kings Road	11-2022	EB	235	25	31	291	289	39	33	361	367	30	26	423
			WB	333	45	42	420	272	41	52	365	264	21	30	314
3	A5057 Merton Road, west of Oriel Road	11-2022	NB	352	33	2	387	225	28	0	254	282	16	0	298
			SB	217	9	26	251	183	9	22	214	253	6	16	275
4	Strand Road, at port entrance	11-2022	EB	353	33	2	388	224	28	0	253	279	16	0	295
			WB	217	9	26	251	182	9	22	212	253	6	16	274
5	Strand Road, east of Bank Road	11-2022	EB	165	13	0	178	297	17	1	315	309	10	0	320
			WB	169	14	3	186	242	14	8	265	227	10	3	240
7	Stonebridge Lane, south of Stonedale Crescent	11-2022	NB	440	66	4	510	370	53	5	427	418	40	2	460
			SB	387	47	4	437	398	41	3	442	531	28	3	562
8	A506 Valley Road, west of Ingoe Lane	11-2022	EB	1,110	87	38	1,235	819	70	24	912	1,018	67	27	1,112
			WB	784	64	45	893	741	53	37	832	947	39	48	1,034
9	Linacre Road, north of Lily Road	11-2022	NB	197	8	11	216	268	9	14	291	303	7	16	326
			SB	224	34	1	258	227	29	1	258	250	22	1	273
10	Orrell Road, north of Walker Drive	11-2022	EB	62	6	0	68	39	4	0	43	45	4	0	49
			WB	75	7	0	83	84	9	0	94	114	8	0	122
11	Parris Drive, south of Gaisworthy Avenue	11-2022	NB	125	16	0	141	162	14	0	176	232	14	0	246
			SB	237	19	1	257	169	13	0	182	189	10	0	199
13	Melling Road	11-2022	NB	144	12	0	156	171	11	0	182	295	13	0	309
			SB	372	15	2	389	172	8	1	181	209	6	2	217
14	B5194 Wango Lane	11-2022	NB	193	21	1	215	240	19	1	259	370	23	1	394
			SB	301	25	0	326	223	17	0	241	246	14	0	260
15	A565 Crosby Road South, south of Cambridge Road	11-2022	NB	860	58	39	956	1,016	59	41	1,116	1,398	26	70	1,494
			SB	1,243	76	78	1,397	853	81	37	971	940	53	31	1,023
16	Sandy Road, north of Chesnut Road	11-2022	SB	285	32	0	317	217	27	0	244	244	18	0	262
17	Kirkistone Road North, north of Moss Lane	11-2022	EB	19	1	0	20	27	1	0	28	39	1	0	40
			WB	27	2	0	28	24	1	0	25	30	1	0	31
18	Copy Lane, south of Browns Lane	11-2022	NB	178	16	0	194	136	12	0	147	176	10	0	186
			SB	165	13	2	181	164	12	1	177	255	15	2	273

CountID	Location	Date	Count Direction	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
19	B5422 Bucley Hill Lane, north of Northern Perimeter Road	11-2022	NB	423	34	5	462	386	32	7	424	502	20	3	526
			SB	637	46	20	702	482	45	12	539	593	36	12	641
20	Northern Permimeter Road, east of Hollinhey Close	11-2022	NB	226	16	1	243	157	11	0	169	145	7	0	152
			SB	102	20	1	123	161	15	1	176	227	15	0	242
21	Bridle Road, east of Farriers Way	11-2022	EB	226	16	1	243	157	11	0	169	145	7	0	152
			WB	114	8	0	123	165	11	0	176	231	11	0	242
22	Sefton Moss Lane	11-2022	NB	130	13	0	143	148	12	0	160	250	15	0	264
			SB	259	18	0	277	123	10	0	132	154	9	0	163
23	Gorsey Lane, south of Pendle Drive	11-2022	NB	542	53	7	602	572	51	8	632	780	37	7	824
			SB	664	68	8	740	514	56	7	577	565	35	2	602

Table 8-2 Observed Flows (veh/hr) at A5036 2022 Traffic Survey count sites (Car/LGV and HGV)

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
25	A565 Crosby Road South, north of Seaforth Road	11-2022	NB	818	213	1,031	1,044	218	1,261	1,652	142	1,794
			SB	1,574	274	1,848	917	227	1,144	975	148	1,124

Appendix B. A5036 Local area model dataset

Figure 8-2 - Location plan of A5036 Local area model dataset with site IDs shown.

Table 8-3 Observed Flows (veh/hr) at A5036 Local are model count sites (Car, LGV, HGV)

Count ID	Location	Date	Count Dir	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
101	B5193	11-2019	NB	484	21	1	505	232	14	0	246	303	8	0	311
			SB	255	12	6	272	219	12	7	237	459	12	8	478
102	A565	11-2019	NB	871	91	11	973	912	84	11	1,007	1,327	61	5	1,393
			SB	1,148	38	22	1,208	925	60	14	998	901	36	7	945
103	Park Wall Road	11-2019	EB	168	15	0	183	66	6	1	72	50	3	0	53
			WB	49	4	0	53	65	4	0	69	103	5	0	108
104	Brownmoor Lane	11-2019	EB	237	14	1	252	217	14	2	233	312	12	2	327
			WB	384	11	11	405	225	11	5	241	285	7	6	298
105	Gorsey Lane	11-2019	NB	333	38	5	376	417	38	6	461	538	29	2	569
			SB	524	47	6	577	423	41	6	469	433	30	1	464
106	A59	11-2019	NB	706	16	26	748	817	23	18	858	823	8	17	848
			SB	711	39	18	769	797	40	23	860	904	23	31	958
107	A565	11-2019	NB	427	34	19	480	493	53	25	572	709	25	13	746
			SB	876	39	24	939	558	46	23	626	594	16	12	622
108	A5038	11-2019	NB	448	29	13	490	481	39	8	529	621	22	7	651
			SB	759	49	22	830	484	40	9	532	561	20	7	588
112	Outside Port entrance	11-2019	NB	365	17	29	411	261	15	27	303	164	6	13	182
			SB	283	4	22	309	284	8	27	319	241	5	15	261
A_1	B5207 Lydiate Lane	10-2017	EB	221	14	1	236	155	12	1	168	167	9	1	177
			WB	152	15	2	169	178	13	1	192	294	11	0	306
A_2	A5758 Broom's Cross Road	10-2017	EB	1,024	61	15	1,101	727	68	13	808	787	46	6	839
			WB	540	61	11	613	766	61	12	839	1,304	49	9	1,362
A_3	A565 Moor Lane	10-2017	EB	733	39	8	781	744	50	7	801	808	27	6	841
			WB	931	63	19	1,014	724	51	10	786	849	28	19	896
A_4	A5036 Princess Way	10-2017	NB	771	76	123	970	769	88	109	966	1,044	57	80	1,181
			SB	806	78	129	1,014	592	64	130	786	758	41	96	896
B_1	Seaforth Road	7-2018	SWB	115	16	6	137	117	16	7	140	117	12	4	134
			NEB	25	3	1	29	27	4	1	32	30	2	0	32
B_2	A59 Warbeck Moor	7-2018	SWB	431	50	20	500	359	39	17	415	383	33	10	426
			NEB	293	33	11	337	368	41	16	425	463	39	9	511
B_3	A57 Liverpool Road	7-2018	SWB	692	88	46	826	526	58	40	624	691	59	38	788
			NEB	511	64	34	610	509	56	39	603	710	61	39	810

Count ID	Location	Date	Count Dir	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
B_4	A5080 Roby Road	7-2018	EB	428	103	21	552	419	113	24	555	636	147	21	804
			WB	548	105	25	678	420	80	19	519	578	86	12	676
B_5	Pilch Lane East, North of A5080	7-2018	NB	290	39	6	335	305	39	7	351	426	39	6	470
			SB	354	47	7	408	316	43	7	366	394	35	5	434
B_6	M62 Between J5 and J6 (on Foot Over Bridge near Lawlers Travel)	7-2018	WB	2,230	416	167	2,812	1,648	325	165	2,138	2,704	259	66	3,028
B_7	A580 East Lancashire Road	7-2018	EB	403	47	172	622	327	38	141	505	488	59	183	730
			WB	588	27	165	780	410	18	99	527	558	17	96	670
B_8	B5312 Grimshaw Road	7-2018	EB	247	46	15	308	424	68	17	508	639	81	10	730
			WB	525	129	21	675	424	118	19	561	426	109	12	547
B_9	A580 East Lancashire Road	7-2018	EB	705	35	169	909	569	25	117	711	597	26	118	741
			WB	691	17	79	787	593	12	58	662	886	25	87	998
B_10	B5407 Liverpool Road	7-2018	EB	81	17	3	101	77	15	4	97	93	23	2	117
			WB	60	23	5	87	61	16	4	81	71	17	2	90

Appendix C. Lancashire County Council dataset

Figure 8-3 - Location plan of Lancashire Count Council dataset with site IDs shown.

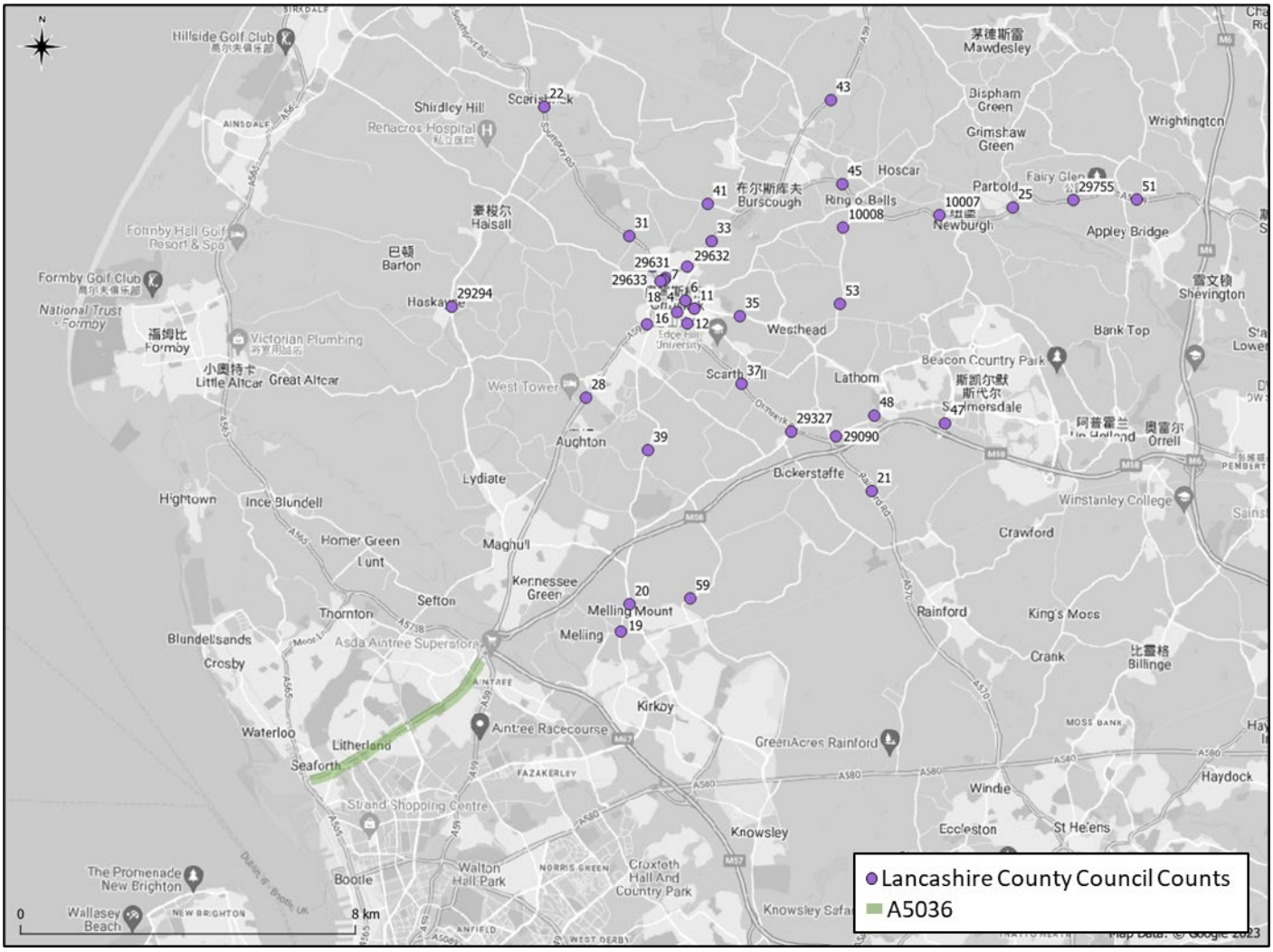


Table 8-4 Observed Flows (veh/hr) at Lancashire County Council count sites (Car, LGV, HGV)

CountID	Location	Date	Count Direction	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
4	Park Road	5-2019	EB	234	9	4	247	220	8	2	230	256	5	2	263
			WB	756	54	38	849	788	36	28	853	893	21	33	948
6	Derby Street	5-2019	EB	941	70	15	1,026	903	83	11	997	1,024	41	10	1,075
7	County Road	5-2019	NB	326	26	15	367	318	29	17	364	380	15	9	404
			SB	405	30	20	455	386	27	19	433	470	16	13	499
11	Wigan Road	5-2019	EB	349	15	3	368	306	18	1	325	327	11	1	339
			WB	321	8	11	340	320	12	5	337	305	9	3	317
12	St Helens Road	5-2019	NB	389	43	15	446	413	35	12	459	586	18	7	610
			SB	476	39	8	523	394	45	6	445	434	20	3	458
16	Holborn Hill	5-2019	EB	646	43	14	704	588	43	13	644	712	28	9	749
			WB	595	42	18	655	603	42	19	664	703	24	8	736
19	Prescot Road	5-2019	NB	224	16	1	241	191	16	1	208	350	17	0	367
			SB	343	22	4	368	200	16	1	217	310	14	1	325
20	Bank Lane	5-2019	NB	482	43	10	535	358	42	11	411	579	32	5	616
			SB	442	41	9	491	333	37	12	382	493	24	5	522
21	Rainford Road	5-2019	NB	499	53	18	570	358	47	17	422	549	42	11	602
			SB	537	59	20	615	361	49	16	426	590	37	11	639
22	Southport Road	5-2019	NB	572	34	11	617	517	37	9	562	707	22	7	736
			SB	625	24	14	663	523	37	11	572	564	17	4	585
25	Alder Lane	5-2019	NB	525	58	14	597	498	53	14	565	700	41	12	753
			SB	640	50	19	708	509	47	19	575	591	31	7	629
28	Northway	5-2019	NB	519	61	15	594	500	55	15	570	703	45	12	759
			SB	639	49	19	706	509	48	20	576	588	31	7	626
28	Northway	5-2019	SB	639	49	19	706	509	48	20	576	588	31	7	626
			NB	519	61	15	594	500	55	15	570	703	45	12	759

CountID	Location	Date	Count Direction	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
31	Southport Road	5-2019	NB	449	46	11	506	421	36	8	465	539	25	3	567
			SB	431	36	10	478	412	41	10	463	463	18	6	487
33	High Lane	5-2019	NB	451	31	30	512	477	35	31	543	565	19	20	604
			SB	525	54	26	604	507	49	21	577	588	26	7	622
35	Crosshall Brow	5-2019	EB	300	15	1	316	310	19	1	330	409	14	1	425
			WB	352	19	2	373	241	16	0	258	242	13	0	256
37	Ormskirk Road	5-2019	NB	594	61	14	669	438	47	11	496	617	28	5	650
			SB	442	46	9	496	464	54	6	525	555	26	4	585
39	Prescot Road	5-2019	NB	144	14	2	161	132	11	2	145	263	11	0	274
			SB	219	15	3	237	111	11	3	125	145	10	1	156
39	Prescot Road	5-2019	NB	144	14	2	161	132	11	2	145	263	11	0	274
			SB	219	15	3	237	111	11	3	125	145	10	1	156
41	Pippin Street	5-2019	EB	263	27	4	294	209	26	5	240	269	16	2	287
			WB	235	29	7	272	232	30	6	268	325	24	3	352
43	Moss Lane	5-2019	NB	305	29	13	347	308	34	16	358	433	24	10	467
			SB	401	40	22	463	306	36	19	361	388	22	12	421
45	Brlars Lane	5-2019	EB	478	40	24	541	335	39	19	393	444	24	12	480
			WB	434	40	18	491	400	40	20	460	555	29	12	595
47	Glenburn Road	5-2019	NB	158	19	5	183	164	21	7	192	266	14	5	285
			SB	230	16	4	249	129	16	5	151	136	8	3	147
48	Skelmersdale Road	5-2019	NB	579	76	48	704	397	79	50	526	652	57	33	742
			SB	572	87	45	704	388	84	47	518	555	45	35	635
51	Hall Lane	5-2019	EB	310	21	1	333	267	19	3	288	377	18	2	398
			WB	304	22	2	328	242	20	2	263	303	12	1	317
53	Hall Lane	5-2019	EB	107	7	1	115	82	8	1	91	134	7	0	141
			WB	136	7	2	145	77	6	1	84	121	5	0	126
59	Hall Lane	6-2019	NB	44	2	0	46	31	3	0	34	68	5	0	72

CountID	Location	Date	Count Direction	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
			SB	64	4	0	69	30	2	0	32	42	1	0	44

Table 8-5 Observed Flows (veh/hr) at Lancashire County Council count sites (Car/LGV, HGV)

CountID	Location	Date	Count Direction	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
10007	Course Lane	9-2022	EB	189	23	213	232	25	257	280	15	295
			WB	244	21	265	265	18	284	278	12	289
10008	Hall Lane	10-2022	NB	279	44	322	274	47	321	377	30	407
			SB	410	35	444	277	33	309	298	24	322
29294	Wanishar Lane	10-2017	NB	234	23	256	206	24	230	329	20	348
			SB	305	30	335	212	25	237	309	17	326
29327	Liverpool Road	11-2017	EB	191	11	202	137	12	149	143	7	150
			WB	99	9	108	126	12	138	182	8	190
29327	Liverpool Road	11-2017	WB	99	9	108	126	12	138	182	8	190
			EB	191	11	202	137	12	149	143	7	150
29632	County Road	3-2019	EB	320	37	356	351	50	401	418	32	450
			WB	279	49	328	325	49	374	398	27	425
29633	Southport Rd	3-2019	NB	313	44	357	399	39	438	455	21	476
			WB	278	27	304	325	38	363	346	16	362
29755	Sparrow Hill	11-2019	EB	324	35	360	329	44	373	386	30	417
			WB	373	47	420	374	42	417	499	26	525

Table 8-6 Observed Flows (veh/hr) at Lancashire County Council count sites (Total)

CountID	Location	Date	Count Direction	AM	IP	PM
				Total	Total	Total
29090	Skelmersdale Road	1-2017	EB	134	147	193
			WB	148	143	184

Appendix D. Liverpool City Region Transport Model dataset

Figure 8-4 - Location plan of Liverpool City Region Transport Model dataset with site IDs shown.

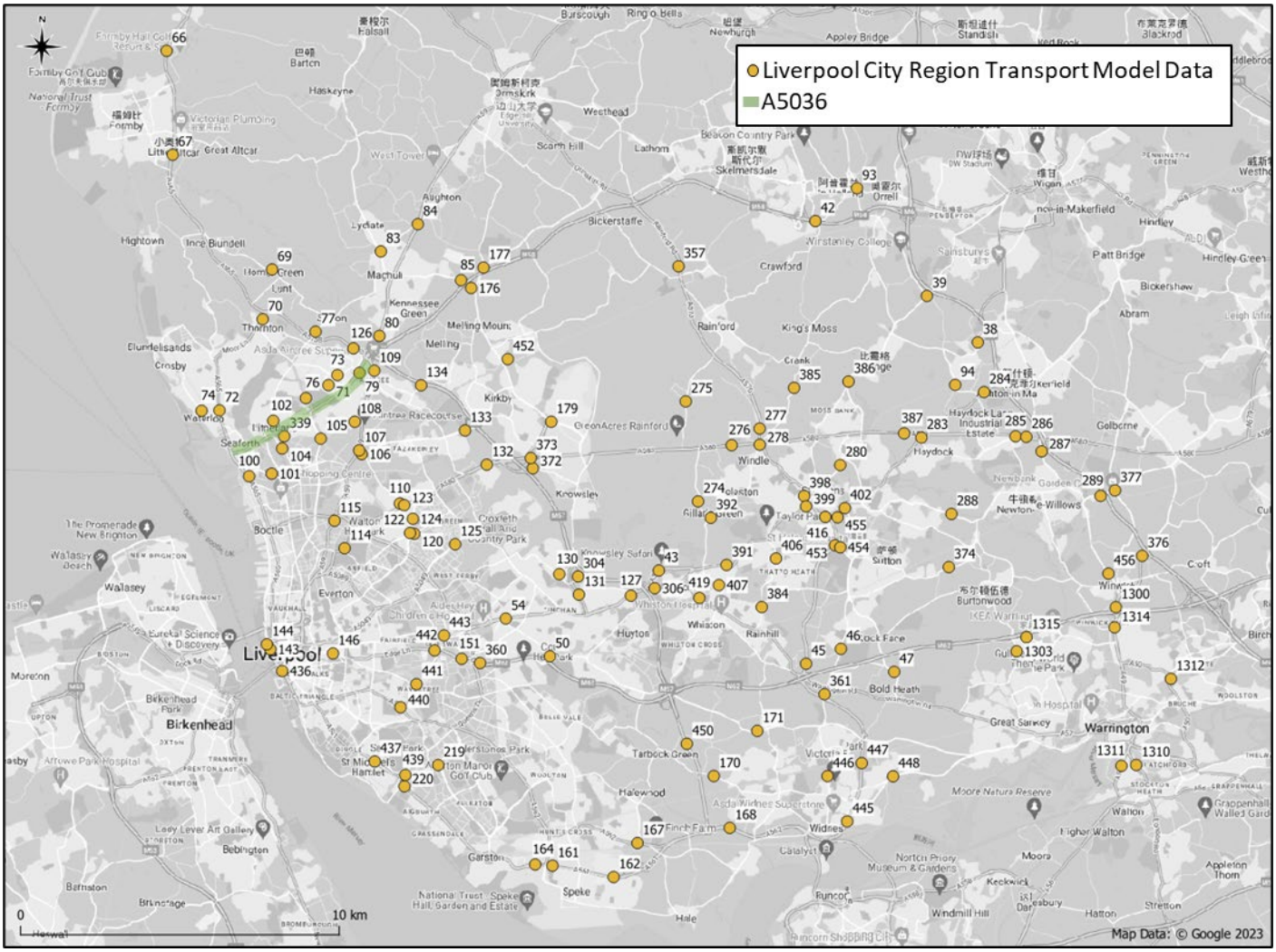


Table 8-7 - Observed Flows (veh/hr) at Liverpool City Region Transport Model count sites (Car, LGV, HGV)

CountID	Location	Date	Count Dir	AM				IP				PM			
				Car	LGV	HGV	Total	Car	LGV	HGV	Total	Car	LGV	HGV	Total
220	A561 Aigburth Road	5-2018	NB	502	567	89	1,158	625	1,162	160	1,947	466	682	54	1,202
			SB	630	411	69	1,109	1,149	865	148	2,162	840	504	63	1,407
274	B5203 Gillars Lane	5-2017	NB	115	112	7	234	140	150	17	307	136	109	6	251
			SB	151	90	11	251	221	160	18	398	167	100	6	274
275	B5203 Mossborough Road	5-2017	NB	105	95	11	211	162	140	24	326	199	144	8	352
			SB	136	187	13	336	105	152	22	279	81	107	5	193
276	A580 East Lancashire Road	5-2017	EB	565	153	90	809	878	257	182	1,317	849	130	53	1,031
			WB	904	210	94	1,208	936	240	169	1,346	674	104	41	818
277	A570 Rainford Road	5-2017	NB	506	82	33	621	897	155	72	1,124	644	64	17	726
			SB	606	88	37	731	933	162	75	1,171	637	64	16	717
278	A570 Rainford Road	5-2017	NB	338	187	30	554	662	397	56	1,115	392	196	15	602
			SB	348	193	21	561	609	364	48	1,022	375	181	12	569
280	A571 Haresfinch Road	5-2017	NB	182	115	17	314	553	368	36	957	381	227	10	618
			SB	331	290	22	643	434	409	39	883	236	191	11	438
283	A58 Stanley Bank Way	5-2017	NB	319	245	48	613	525	402	93	1,020	326	217	23	566
			SB	233	195	47	475	490	427	102	1,019	345	271	31	648
284	A58 Liverpool Road	5-2017	EB	291	132	47	470	478	248	95	821	346	136	24	506
			WB	236	161	37	434	406	345	100	851	249	162	24	435
285	A580 East Lancashire Rd	5-2017	EB	947	220	165	1,333	1,289	345	311	1,945	874	133	83	1,090
			WB	750	186	149	1,085	1,415	370	326	2,111	1,337	187	107	1,631
286	A599 Penny Lane	5-2017	EB	133	166	16	315	201	270	36	507	122	164	10	296
			WB	113	174	21	307	197	295	41	533	146	196	13	355
287	A49 Lodge Lane	5-2017	NB	175	138	23	336	293	315	50	659	252	189	15	456
			SB	147	145	21	312	235	263	43	541	207	162	14	383
288	A572 Pennington Lane	5-2017	EB	194	92	17	303	362	187	32	580	245	105	14	363
			WB	114	158	20	291	203	301	33	536	113	154	11	278
289	A572 Southworth	5-2017	EB	186	107	13	305	269	167	23	460	268	160	10	437

	Road		WB	82	81	10	172	151	148	15	313	107	97	4	209
306	Liverpool Road	5-2018	EB	560	79	14	654	1,180	177	23	1,380	749	85	3	836
			WB	640	106	12	758	1,181	173	26	1,381	726	73	4	804
357	A570 Rainford Road	5-2018	NB	494	89	26	609	678	139	46	863	573	73	17	662
			SB	541	93	27	660	676	149	52	877	615	70	12	697
360	Bowring Park Road	5-2018	EB	2,082	339	108	2,530	3,551	826	251	4,629	2,818	338	48	3,204
			WB	2,239	436	119	2,794	3,075	688	244	4,007	2,333	279	55	2,667
361	Jubits Lane	5-2018	NB	368	190	17	574	511	262	43	816	368	130	13	511
			SB	298	107	41	446	537	259	57	853	412	192	25	629
372	School Lane	5-2018	EB	317	205	40	561	258	204	98	559	157	78	31	266
			WB	102	143	53	297	175	329	98	602	229	275	26	529
373	A580 East Lancashire Road	5-2018	EB	570	144	67	782	766	226	151	1,143	758	117	47	922
			WB	676	158	76	910	768	216	142	1,126	677	87	32	796
374	B5204 Bold Lane	5-2018	EB	236	47	5	289	337	80	10	427	258	37	1	296
			WB	224	50	6	280	329	80	13	421	269	36	1	306
376	A49 Winwick Link Road	5-2018	NB	656	149	48	853	955	235	75	1,265	710	79	17	806
			SB	650	148	45	843	985	266	102	1,353	697	93	25	815
377	A573 Parkside Road	5-2018	NB	331	38	4	373	249	35	8	293	177	16	1	194
			SB	147	24	2	173	326	53	6	385	343	42	1	386
436	The Strand	5-2018	NB	1,433	194	60	1,687	2,287	415	103	2,804	1,716	137	18	1,872
			SB	1,573	233	57	1,863	2,466	419	99	2,983	1,839	125	13	1,977
437	A561 Aigburth Road	5-2018	NB	754	85	18	857	1,222	167	27	1,416	790	60	4	853
			SB	619	68	18	705	1,273	168	27	1,468	1,016	77	5	1,097
439	A5058 Ashfield Road	5-2018	NB	142	64	6	212	289	124	12	426	161	56	2	219
			SB	127	101	8	236	317	235	24	575	224	150	7	380
440	A562 Smithdown Road	5-2018	EB	331	52	9	392	1,029	129	21	1,178	738	46	4	788
			WB	610	59	8	677	1,061	127	15	1,204	558	36	2	596
441	B5178 Wavertree Road	5-2018	EB	208	151	23	381	520	368	48	935	341	138	13	491
			WB	487	166	27	680	738	258	52	1,049	383	92	11	486
442	A5047 Edge Lane	5-2018	EB	879	172	46	1,097	2,298	470	103	2,871	1,460	147	17	1,623
			WB	1,446	248	51	1,745	2,253	376	88	2,717	1,339	128	13	1,479

443	A57 Prescot Road	5-2018	EB	633	108	16	757	1,407	240	33	1,679	902	109	4	1,015
			WB	734	126	14	875	1,232	193	25	1,450	694	73	3	770
445	A557 Ashley Way	5-2018	NB	1,085	242	165	1,492	2,087	499	390	2,975	1,778	224	92	2,094
			SB	1,268	310	166	1,744	1,749	436	378	2,563	1,216	147	83	1,446
446	B5419 Birchfield Road	5-2018	NB	242	152	13	408	609	382	27	1,018	428	278	11	717
			SB	344	261	15	620	566	480	31	1,077	322	265	11	598
447	A557 Watkinson Way	5-2018	NB	599	141	95	835	1,462	308	222	1,992	1,311	153	62	1,525
			SB	988	229	97	1,314	1,263	282	234	1,779	832	84	62	979
448	A562 Dans Way	5-2018	EB	373	58	25	456	694	111	56	861	543	53	7	602
			WB	401	60	30	492	698	118	71	886	443	39	12	493
450	A5300 Knowsley Expressway	5-2018	NB	1,343	285	192	1,821	2,527	555	400	3,482	2,251	300	105	2,656
			SB	1,975	419	202	2,595	2,243	489	415	3,147	1,557	201	88	1,846
452	Headbolt Lane	5-2018	EB	127	55	11	193	207	88	24	319	150	46	10	206
			WB	123	72	8	203	171	123	14	308	121	81	4	206
453	A570 Linkway	5-2018	NB	1,063	184	62	1,309	1,833	377	125	2,335	1,232	144	29	1,405
			SB	860	189	61	1,110	1,708	310	127	2,145	1,175	111	22	1,309
454	A569 Scorecross	5-2018	NB	372	246	33	651	681	513	60	1,254	483	208	16	707
			SB	438	173	20	632	867	355	46	1,268	485	141	8	634
455	A58 Linkway East	5-2018	NB	747	107	31	885	1,529	207	55	1,791	828	79	12	919
			SB	582	111	35	728	1,684	209	57	1,950	928	75	8	1,011
456	A49 Newton Road	5-2018	NB	114	105	18	236	275	303	43	621	306	291	22	618
			SB	232	237	22	491	228	268	39	534	139	142	11	292

Table 8-8 Observed Flows (veh/hr) at Liverpool City Region Transport Model count sites (Car/LGV, HGV)

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
38	B5207 DOWNALL GREEN ROAD	9-2017	NB	178	12	190	267	20	287	200	12	211
			SB	151	14	165	282	20	302	205	9	214
39	A571 WIGAN ROAD	9-	NB	208	15	223	311	29	340	257	14	270

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
		2017	SB	251	20	271	302	29	331	254	11	265
43	A58 ST HELENS ROAD	9-2017	EB	483	29	512	902	44	945	705	33	738
			WB	567	56	623	764	41	805	442	29	471
45	A570 ST HELENS LINKWAY	9-2017	NB	753	101	854	1,184	193	1,376	888	116	1,003
			SB	823	169	992	1,373	236	1,609	811	141	953
46	B5419 JUBITS LANE	9-2017	NB	250	36	285	480	80	560	354	31	385
			SB	330	35	365	492	53	545	320	16	336
47	A569 CLOCK FACE ROAD	9-2017	EB	332	27	359	340	43	383	250	15	266
			WB	219	15	234	393	37	430	361	16	377
50	A5080 ROBY ROAD	9-2017	EB	498	35	533	933	71	1,004	679	29	708
			WB	578	39	617	913	63	976	578	39	617
54	A57 EAST PRESCOT ROAD	9-2017	EB	556	55	611	1,296	122	1,418	875	57	932
			WB	814	66	879	1,231	118	1,349	715	49	764
66	A565 FORMBY BYPASS	9-2017	NB	778	81	858	1,647	144	1,791	1,159	87	1,247
			SB	1,006	99	1,105	1,579	132	1,711	894	64	957
67	A565 FORMBY BYPASS	9-2017	NB	615	68	683	1,315	131	1,446	995	79	1,074
			SB	955	79	1,034	1,354	97	1,451	763	48	811
69	EAST LANE	9-2017	EB	97	9	106	109	14	122	52	5	57
			WB	45	5	50	112	8	120	45	5	50
70	A565 PARK VIEW	9-2017	NB	688	59	747	1,060	107	1,167	626	32	659
			SB	780	47	826	1,196	110	1,306	746	35	781
71	PARK LANE WEST	9-2017	NB	228	29	257	653	59	712	417	25	442
			WB	438	41	479	678	62	741	352	27	379
72	A565 CROSBY ROAD NORTH	9-2017	NB	789	36	825	1,425	118	1,543	915	64	979
			SB	797	93	890	1,060	131	1,191	546	38	584
73	BROWNS LANE	9-2017	EB	95	6	101	160	8	168	128	6	135
			WB	100	10	109	178	14	192	142	11	153

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
74	OXFORD ROAD	9-2017	NB	571	31	602	747	57	804	383	16	399
			SB	271	24	295	782	59	841	675	27	702
76	BOUNDARY ROAD	9-2017	NB	286	21	307	597	44	641	553	30	583
			SB	529	33	562	572	42	614	337	14	350
77	B5422 BRICKWALL LANE	9-2017	NB	305	33	338	660	58	718	519	24	543
			SB	507	44	551	681	75	756	421	27	449
79	COPY LANE	9-2017	EB	257	22	279	638	38	675	346	16	362
			WB	291	30	321	640	50	690	368	19	386
80	A59 NORTHWAY	9-2017	NB	756	114	870	1,743	262	2,005	1,143	214	1,357
			SB	1,317	128	1,445	1,895	129	2,025	965	65	1,030
83	A5147 SOUTHPORT ROAD	9-2017	NB	274	29	302	527	51	578	438	22	460
			SB	469	28	497	586	56	642	390	18	408
84	A59 NORTHWAY	9-2017	NB	218	13	231	1,137	64	1,201	658	48	706
			SB	330	14	344	1,244	47	1,291	657	30	687
85	MAGHULL LANE	9-2017	NB	494	36	530	596	71	667	376	24	400
			SB	397	41	437	628	78	707	554	32	585
93	A577 PARLIAMENT STREET	9-2017	NB	321	26	347	538	46	584	327	16	343
			SB	350	29	379	580	48	627	439	24	463
94	GARSWOOD LANE	9-2017	NB	171	20	190	443	38	480	417	23	440
			SB	366	24	390	402	33	436	205	14	219
100	A565 PRIMROSE ROAD	9-2017	NB	790	167	957	2,184	214	2,398	1,623	200	1,823
			SB	1,495	245	1,740	1,875	226	2,100	931	90	1,021
101	A566 KNOWSLEY ROAD	9-2017	EB	247	30	277	572	57	630	347	20	368
			WB	280	31	311	596	57	653	350	23	373
102	B5422 SEFTON ROAD	9-2017	EB	381	37	418	982	84	1,066	780	35	814
			WB	588	71	659	816	111	927	454	48	501
104	A5090 HAWTHORNE ROAD	9-	NB	428	53	481	1,159	98	1,256	782	33	815

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
		2017	SB	620	60	680	1,044	106	1,150	578	35	613
105	A5038 NETHERTON WAY	9-2017	NB	968	86	1,054	1,672	188	1,860	1,145	105	1,250
			SB	1,081	174	1,256	1,742	238	1,980	1,147	120	1,267
106	A506 LONGMOOR LANE	9-2017	EB	507	57	564	963	123	1,086	535	62	596
			WB	653	56	709	1,154	97	1,251	637	38	675
107	A59 WARBRECK MOOR	9-2017	NB	346	28	375	828	75	903	526	26	552
			SB	493	49	542	743	82	825	399	27	426
108	PARK LANE	9-2017	EB	554	49	602	1,137	94	1,231	712	35	747
			WB	541	47	588	1,040	92	1,132	599	30	629
109	A59 ORMSKIRK ROAD	9-2017	NB	589	80	670	1,607	164	1,771	958	68	1,027
			SB	662	80	742	1,433	125	1,558	725	48	772
110	B5187 STOPGATE LANE	9-2017	NB	632	58	690	1,078	120	1,197	590	30	620
			SB	560	63	623	1,138	120	1,258	684	36	720
114	A580 WALTON LANE	9-2017	NB	618	106	724	1,088	225	1,314	680	73	753
			SB	893	152	1,046	1,206	204	1,410	791	63	854
115	A59 COUNTY ROAD	9-2017	NB	470	46	516	1,130	98	1,228	685	39	724
			SB	687	61	747	1,164	95	1,259	631	38	668
120	UTTING AVENUE EAST	9-2017	EB	832	34	866	2,264	72	2,336	1,515	37	1,552
			WB	491	41	531	833	63	896	491	41	531
122	A580 TOWNSEND AVENUE	9-2017	NB	480	59	539	998	124	1,122	647	47	695
			SB	598	59	657	1,034	106	1,140	634	43	677
123	A580 EAST LANCASHIRE ROAD	9-2017	EB	647	130	777	1,110	274	1,384	698	126	824
			WB	1,055	137	1,191	1,353	214	1,567	953	99	1,052
124	A580 TOWNSEND AVENUE	9-2017	NB	289	28	317	611	57	669	411	23	435
			SB	398	34	431	613	48	661	435	27	461
125	MUIRHEAD AVENUE EAST	9-2017	EB	727	69	795	1,363	149	1,512	1,041	71	1,112
			WB	985	106	1,091	1,453	134	1,586	985	106	1,091

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
126	A5758 BROOMS CROSS ROAD	9-2017	NB	685	76	761	1,411	167	1,578	1,325	80	1,405
			SB	1,138	92	1,231	1,380	114	1,494	767	38	805
127	A57 LIVERPOOL ROAD	9-2017	EB	468	50	518	846	103	949	499	41	541
			WB	428	60	487	832	112	944	539	43	582
130	WATERPARK DRIVE	9-2017	EB	435	37	472	687	59	746	456	21	477
			WB	403	32	435	716	57	773	403	32	435
131	A526 SETH POWELL WAY	9-2017	NB	516	36	552	766	71	837	573	26	599
			SB	611	50	661	859	82	941	674	37	712
132	A580 EAST LANCASHIRE ROAD	9-2017	EB	1,029	212	1,242	1,814	403	2,217	1,162	138	1,300
			WB	914	267	1,182	1,520	399	1,919	993	161	1,154
133	A506 VALLEY ROAD	9-2017	EB	811	113	924	1,497	197	1,694	1,009	95	1,104
			WB	1,010	125	1,135	1,531	187	1,719	1,010	125	1,135
134	SPENCER'S LANE	9-2017	NB	185	11	196	510	34	544	497	21	518
			SB	449	24	472	463	30	493	320	15	335
143	A5052 KING EDWARD STREET	9-2017	NB	612	65	678	1,446	181	1,627	999	43	1,042
			SB	610	52	662	756	90	847	421	16	437
144	A5036 BATH STREET	9-2017	NB	586	75	661	975	109	1,084	687	43	731
			SB	538	58	596	864	108	972	399	25	424
146	A5047 PEMBROKE PLACE	9-2017	EB	325	24	349	489	56	545	331	13	344
			WB	264	18	283	336	33	369	318	11	330
151	A5080 BROAD GREEN ROAD	9-2017	EB	826	114	939	1,708	265	1,973	1,175	130	1,305
			WB	926	158	1,084	1,592	296	1,888	980	140	1,120
161	A561 SPEKE BOULEVARD	9-2017	EB	1,032	208	1,240	2,147	445	2,591	1,138	169	1,307
			WB	1,303	199	1,502	2,125	372	2,498	1,154	136	1,290
162	A561 SPEKE BOULEVARD	9-2017	EB	1,009	99	1,107	2,084	222	2,306	1,567	161	1,728
			WB	1,320	184	1,505	2,069	147	2,216	1,272	57	1,329
164	A561 SPEKE ROAD	9-	EB	934	165	1,099	2,104	363	2,467	988	129	1,117

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
		2017	WB	1,151	222	1,373	1,918	412	2,331	1,176	153	1,329
167	A562 HIGHER ROAD	9-2017	EB	469	43	513	780	105	885	458	34	493
			WB	453	57	510	738	96	834	530	34	564
168	A562 SPEKE ROAD	9-2017	EB	1,398	187	1,585	2,014	281	2,295	1,471	150	1,622
			WB	828	294	1,122	1,437	411	1,848	1,128	250	1,377
170	B5178 NETHERLEY ROAD	9-2017	EB	145	17	162	221	31	252	159	14	174
			WB	152	19	170	220	30	250	168	11	179
171	A5080 CRONTON ROAD	9-2017	EB	235	23	258	415	45	459	382	21	403
			WB	371	21	391	414	38	452	278	13	290
176	MAGHULL LANE	9-2017	NB	522	52	574	776	102	878	639	36	675
			WB	567	50	617	751	106	857	532	38	570
177	A506 CUNSCOUGH LANE	9-2017	NB	185	22	207	306	42	348	250	14	264
			SB	217	19	236	292	39	331	188	13	201
179	A5208 SOUTH BOUNDARY ROAD	9-2017	EB	378	77	455	506	142	648	261	39	300
			WB	344	115	459	639	174	812	389	45	433
339	Orrel Road	2017	SB	161	13	174	190	20	210	126	10	137
			NB	104	13	117	254	29	282	195	17	211
384	B5413 Rainhill Road	2017	NB	347	25	372	743	59	801	497	25	523
			SB	406	35	441	762	69	831	462	27	489
385	B5201 Crank Road	2017	NB	46	4	50	128	9	137	115	6	121
			SB	125	5	130	130	10	140	63	4	66
386	Birchley Road	2017	NB	395	39	434	814	73	888	694	39	734
			SB	685	73	758	741	92	833	454	45	500
387	A580 East Lancashire Road	2017	EB	988	197	1,185	1,437	332	1,770	1,018	127	1,145
			WB	1,041	173	1,214	1,554	304	1,858	1,177	115	1,291
391	A58 St Helens Road	2017	EB	448	32	480	833	58	891	532	25	557
			WB	454	32	486	825	58	883	493	21	515

CountID	Location	Date	Count Dir	AM			IP			PM		
				Car/LGV	HGV	Total	Car/LGV	HGV	Total	Car/LGV	HGV	Total
392	B5201 Burrow's Lane	2017	NB	179	15	194	428	35	463	365	18	383
			SB	371	15	386	423	27	450	269	11	280
398	A570 Kirkland Street	2017	NB	423	48	471	1,137	95	1,233	685	27	712
			SB	511	31	542	950	64	1,014	485	22	507
399	A58 Westfield Street	2017	EB	744	82	826	1,383	169	1,552	699	61	759
			WB	656	77	733	1,731	160	1,891	1,043	66	1,109
406	Thatto Heath Road	2017	NB	308	29	337	616	56	672	376	24	400
			SB	418	40	459	893	76	969	577	32	609
407	Old Lane	2017	EB	194	9	203	266	15	280	210	8	218
			WB	135	7	142	224	14	239	181	7	188
416	A570 Linkway West	2017	EB	960	119	1,079	2,060	244	2,304	1,035	80	1,114
			WB	842	137	978	2,182	254	2,436	1,185	91	1,276
419	A57 Warrington Road	2017	EB	497	41	538	1,056	79	1,136	623	27	650
			WB	430	36	466	967	81	1,048	571	27	598

Table 8-9 Observed Flows (veh/hr) at Liverpool City Region Transport Model count sites (Total)

CountID	Location	Date	Count Dir	AM	IP	PM
				Total	Total	Total
304	Stockbridge Lane	2017	EB	115	253	174
			WB	175	257	119
1300	A49 Newton Road	2019	NB	1,291	2,631	1,803
			SB	1,646	2,469	1,304
1303	Burtonwood Road	2019	NB	669	786	472
			SB	442	917	896
1310	Wilderspool Causeway	2019	NB	519	1,107	635
			SB	702	1,053	413
1311	Chester Road	2019	NB	691	1,221	677

CountID	Location	Date	Count Dir	AM	IP	PM
				Total	Total	Total
			SB	760	1,331	872
1312	Birchwood Way	2019	NB	647	1,069	605
			SB	465	939	666
1314	Winwick Road	2019	NB	1,216	2,933	1,769
			SB	1,723	2,765	1,359
1315	Charon Way	2019	EB	565	937	444
			WB	227	805	507

Appendix E. Port operations

DIRECTION

Inbound to the Port of Liverpool

Outbound from the Port of Liverpool

TIME

15 minute intervals between 07:00 and 19:00

HGV TYPE

OGV1 = Rigid HGV

OGV2 = Articulated (artic) HGV

AXLE TYPE

4W = Rigid HGV with 2 axles

6W = Rigid HGV with 3 axles

8W = Rigid HGV with 4 axles

2A = Artic HGV with 2 axles (i.e. not pulling a trailer)

3A = Artic HGV with 3 axles (i.e. not pulling a trailer)

4A = Artic HGV with 4 axles

5A = Artic HGV with 5 axles

6A = Artic HGV with 6 axles

7A+ = Artic HGV with 7 or more axles (typically an abnormal load)

COMMODITY TYPE

Aggregate	Loose bulk aggregate such as gravel
Cars	Transporting automotive vehicles
Cement	Cement mixer
Chemical	Chemical tanker
Crane	Mobile crane
Curtainside	Curtainsided lorry used in groupage
Grain	Loose bulk agricultural products such as grain
Intermodal	Intermodal (i.e. container) carrying lorry
Metal	Finished metal products such as steel beams
No Trailer	Not pulling a trailer

Other	Not able to identify a load or something unique
Parcel	Carrying parcels and/or post
Plant	Carrying mobile plant equipment
RoRo	Identified in relation to a dedicated ferry line company such as P&O
Scrap Metal	Scrap metal

LADEN STATUS

Laden	Carrying a load as all axles are in contact with the road
Empty	Specifically intermodal lorries carrying a container but have at least one axle lifted indicating that the container is empty
Unladen	Not carrying a load as at least one axle lifted indicating that the trailer is unladen
Unknown	Unable to determine laden status, typically due to poor lighting conditions

INTERMODAL TYPE

1 TEU	Intermodal lorry carrying one twenty foot unit
2 TEU	Intermodal lorry carrying two twenty foot units
1 FEU	Intermodal lorry carrying one forty foot unit
Unladen	Intermodal lorry not carrying a container