Land-Use and Transport Integration in Scotland (LATIS)

TMfS:07 National Road Model Calibration & Validation

Report for Transport Scotland

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Background

LATIS Commission – Development of Modelling Framework

In August 2006 Transport Scotland commissioned MVA Consultancy to a Term Commission for the maintenance and enhancement of the Transport Model for Scotland (TMfS) and the accompanying Transport, Economic and Land-use Model of Scotland (TELMoS).

A central element of the Commission was to develop and deliver an enhanced 2007-based land-use and transport modelling system. MVA proposed a hierarchical modelling framework, with a single National Strategic Travel demand and Land Use Modelling framework as the upper tier, Regional Travel Demand Models as the mid-tier and detailed local models (eg microsimulation) as the lower tier. The National Modelling Framework has now been developed. It incorporates a number of technical enhancements and new and more robust data and will, in time, replace its predecessor, TMfS/TELMoS:05.

On 6 November 2008, the TMfS Term Commission changed its name to Land-Use and Transport Integration in Scotland (LATIS). The service is provided by Transport Scotland and their supporting consultants and offers a wide range of support and technical advice.

The LATIS service currently includes four distinct elements, as follows:

a user engagement programme, consultations, discussions and advice on a range of transport and travel planning issues;

the collection and provision of land-use planning data;

the collection of transport data through the use of the Data Collection Contract; and

a travel demand and land-use modelling suite.

The TMfS:07 and TELMoS:07 models are designed to deliver the fourth of these elements.

TMfS:07 & TELMoS:07 Model Reports

This report describes the development of the TMfS:07 National Road Model and is one of a series of eight documents describing the construction, calibration and validation of the TMfS:07 and TELMoS:07 models, as shown below:

TMfS:07 National Travel Demand Model

1. TMfS:07 Demand Model Development Report.

TMfS:07 National Road Model

2. TMfS:07 National Road Model Development Report; and
3. TMfS:07 National Road Model Calibration & Validation Report.

TMfS:07 National Public Transport Model

4. TMfS:07 National Public Transport Model Development Report; and
5. TMfS:07 National Public Transport Model Calibration and Validation Report.

TELMoS:07 National Land Use Model

6. TELMoS:07 Model Description Report;
7. TELMoS:07 Assembly of Planning Policy Inputs; and
8. TELMoS:07 Model Demonstration Report.

1 Introduction

1.1 Overview

1.1.1 The National Road Model forms part of the overall 2007 TMfS model hierarchy (illustrated in Figure 1.1). It is a strategic model which has been prepared with a level of detail commensurate with appraising national policy and strategic land-use and transport interventions and providing a key source of transport supply and demand data.

1.1.2 TMfS:07 will also form the starting point for the development of Sub-Area and Regional models; providing assistance in preparation of model structure, input to base year development and providing a source of forecast year travel demand.

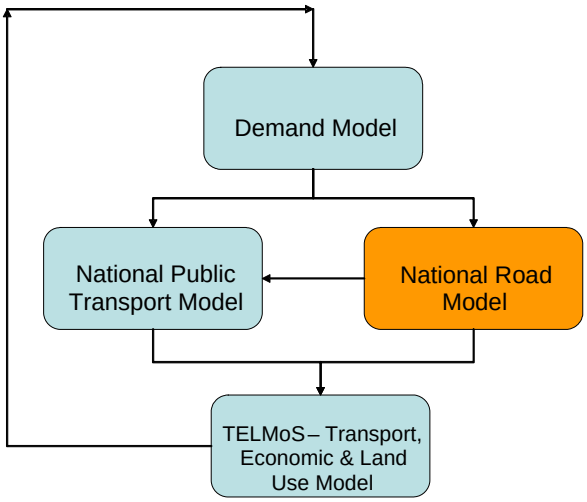

Figure 1.1 Overview of the TMfS Model Hierarchy – National Road Model Interaction

1.1.3 This report presents and discusses the calibration and validation results of the Base Year Road Model.

1.1.4 The TMfS:07 modelled base year is representative of 2007 transport conditions.

1.1.5 The model covers three time periods within a 'typical' weekday. These are:

- Average AM Peak Hour between 0700-1000;
- Average Inter Peak Hour (1/6 of 1000 – 1600); and
- Average PM Peak Hour between 1600-1900.

1.1.6 For the peak time periods, the 'average peak hour' represents the 'peak hour' within the three hour period. This 'peak hour' was calculated using relevant observed traffic count data collected across Scotland and therefore represents a 'Scottish Average' peak hour within the relevant time period.

1.1.7 The model includes five user classes, as follows:

- Car In-Work;
- Car Non-Work Commuters;
- Car Non-Work Others;
- LGV and;
- HGV.

1.1.8 Bus traffic on the network is modelled using fixed pre-load flows. The bus routes are imported from the National Public Transport Model.

1.1.9 Citilabs CUBE Voyager software version 5.0.2 has been used in calibration and validation procedures.

1.2 Calibration and Validation of the National Road Model

1.2.1 The calibration and validation process to demonstrate the 'goodness of fit' of the National Road model against observed data (be that calibration data and\or validation data) makes use of a high volume of observed data from a wide range of data sources. Given the very nature of the model, the data sources available can have significant variation in both quantity and quality and by geographical area. Furthermore, some data is time series (ie collected over a long period of time (eg Automatic Traffic Count data), some data is collected on a single day (eg an RSI) and some data represents data collected within a specific period of time (eg 2001 census, May 2007 local traffic counts).

1.2.2 Steps have been taken to try and ensure a degree of consistency of the observed data to a common base year of 2007. However, with such a wide range of data sources being used there are likely to be inconsistencies between the observed datasets used to demonstrate goodness of fit.

1.2.3 Throughout this report, reference is made to DMRB guidance for goodness of fit in model calibration and validation. It is widely considered that the current DMRB guidance is not directly appropriate for a model of the size and strategic nature of the National Road Model. The guidance was written predominantly for smaller road models built for specific scheme appraisal, covering road assignment only and covering a geographical area commensurate with the sphere of influence of the scheme being appraised. Ideally for the purpose of such a model observed data would be collected in a time frame close to the base year of the model to ensure consistency. Although the observed data used in the development of the National Road Model does not meet these criteria and the model itself is far larger, more strategic and different in specification to that which formed the basis of the guidance within DMRB, it is nonetheless the only guidance that is currently available for road assignment models (it is anticipated that the DMRB guidance will be reviewed in the coming years in light of strategic models such as TMfS).

1.2.4 As a consequence, the guidance limits within DMRB are considered too stringent for a model such as TMfS. However, the calibration and validation process of TMfS makes efforts to balance a goodness of fit between all observed data sources and the resultant base model assignment.

1.3 Structure of this report

1.3.1 Following this introductory chapter, the remainder of this report will consist of the following chapters and headings:

Chapter 2 – Calibration

- Introduction;
- Matrix Estimation;
- Demand Matrix Comparisons;
- Trip Length Distribution Analysis;
- GEH Statistic;
- DMRB Total Screenline Calibration Criteria;
- Strategic Screenline Traffic Flows;
- DMRB Individual Link Count Calibration Criteria;
- Individual Calibration Points;
- Modelled Traffic Flow & Observed Count Correlation Analysis; and
- Road Model Calibration Conclusions.

Chapter 3 – Validation

- Introduction;
- DMRB Link Count Validation Criteria;
- Total Traffic Flow Validation;
- Heavy Goods Vehicle Flow Validation;
- Traffic Flow on Scotland's Key Road Bridges;
- DMRB Journey Time Validation Criteria;
- Journey Time Validation;
- RSI Journey Length Analysis;
- RSI Trip Distribution Analysis;
- RSI Car In-Work, Car Non-Work Analysis;
- Demand Matrix Trip Ends & Planning Data Analysis;
- Census Travel-to-Work & Car Non-Work Commuter Traffic Analysis; and
- Road Model Validation Conclusions.

Chapter 4 – Conclusions & Recommendations

- Conclusions; and
- Recommendations.

2 Calibration of the National Road Model

2.1 Introduction

2.1.1 The Road Model calibration process makes use of a number of traffic counts organised into screenlines, proportions of trips by OD crossing the screenlines and initial estimates of the trip matrices ('prior matrices') and travel paths through the transport network. The process brings together this data to estimate the trip matrix which is most consistent with the input data. The 'level of fit' of modelled traffic flows is verified by comparison against observed available observed data.

2.1.2 Each of the screenlines was made up of a 'set' of road links and thus the screenlines represent an aggregate of a number of traffic counts. Only a small number are individual link screenlines.

2.1.3 Once a reasonable match of aggregate screenlines was achieved, individual links were added to the calibration process to produce a finer level of calibration across the strategic road network.

2.1.4 In total, 43 screenlines were used in the calibration process (in both directions). These included a total of 137 traffic count sites in the AM and PM Peak hours and 134 for the Average Inter Peak hour (three of the sites in Clackmannanshire did not have inter-peak period count information).

2.1.5 A full list detailing the characteristics of the screenlines is shown in Appendix A of this report. These tables are supplemented with graphical plots of screenline by screenline area in Appendix B.

2.1.6 Count data is available for both directions across each screenline – for ease of reference the two sets of counts for screenline X are labelled X and X01 (eg 1 and 101, 2 and 201, 43 and 4301 etc).

2.1.7 All observed and modelled values in the calibration process are in Total[1] Passenger Car Units (PCUs). NB observed values in the calibration process do not consider motorbikes, taxis or buses. Modelled values, however, contain bus pre-load information and this 'mis-match' will have a minor affect on GEH statistics but will not change the overall conclusions presented in this chapter.

2.1.8 All analysis has been carried out for the three modelled time periods, ie:

- Average AM Peak Hour between 0700-1000;
- Average Inter Peak Hour (1/6 of 1000 – 1600); and
- Average PM Peak Hour between 1600-1900.

[1] total PCUs represent a combination of ALL user class traffic, ie Cars + LGVs + HGVs. PCU factor for Cars and LGVs is 1.0, for HGVs it is 1.9.

2.2 Matrix Estimation

Overview

2.2.1 As part of the calibration process matrix estimation procedures were undertaken using Citilabs CUBE Voyager ANALYST software.

2.2.2 Matrix estimation is a process which is adopted for base year matrix development only. The procedure seeks to modify the prior trip matrices to better match link count, trip end and travel pattern information.

2.3 Matrix Estimation Data Sources

2.3.1 The matrix estimation process for Road Model base year trip matrix development used a wide variety of data sources to estimate a goodness of fit. These data sources and the confidence levels[2] associated with them are summarised below:

- Calibration Screenline Aggregate Observed Traffic Counts – 100%;
- Trip End Data – 30% internal zones; 20% external zones;
- Prior Matrix – 80% travel pattern; and
- Traveller Paths.

Calibration Screenline Aggregate Observed Traffic Counts

2.3.2 A variety of observed traffic count sources made up the calibration screenlines. These are:

- The Scottish Roads Traffic Database (SRTDb) – 2007 neutral month, average weekday peak hour data;
- Counts conducted during Road Side Interviews (RSI) – the majority were carried out during 2007, though some date back to 2005;
- 2005 based traffic counts (used to in the construction of the TMfS.05A Model); and
- A small number of 'gap-plugging' traffic counts carried out during October 2008.

2.3.3 Average AM Peak hour, average Inter-Peak (1/6 of 1000 – 1600) and average PM Peak hour traffic count data was used from each of these data sources.

2.3.4 TMfS.05A traffic counts were 'uplifted' to the 2007 base year using an uplift factor calculated from SRTDb traffic growth in the relevant area (see Figure 2.1 overleaf). Roadside Interview Data from 2005 and 2006 were 'uplifted' to the 2007 base year using year-on-year traffic kilometre growth for the relevant Local Authority. The small number of October 2008 traffic counts were included in the calibration without adjustment (since no robust measures of 2007 – 2008 traffic growth were available).

2.3.5 Note that all adjustment factors were obtained from the Scottish Transport Statistics Bulletin.

[2] Confidence levels control the 'weightings' applied to the various input data used in the matrix estimation process. The confidence levels are relative, rather than absolute.

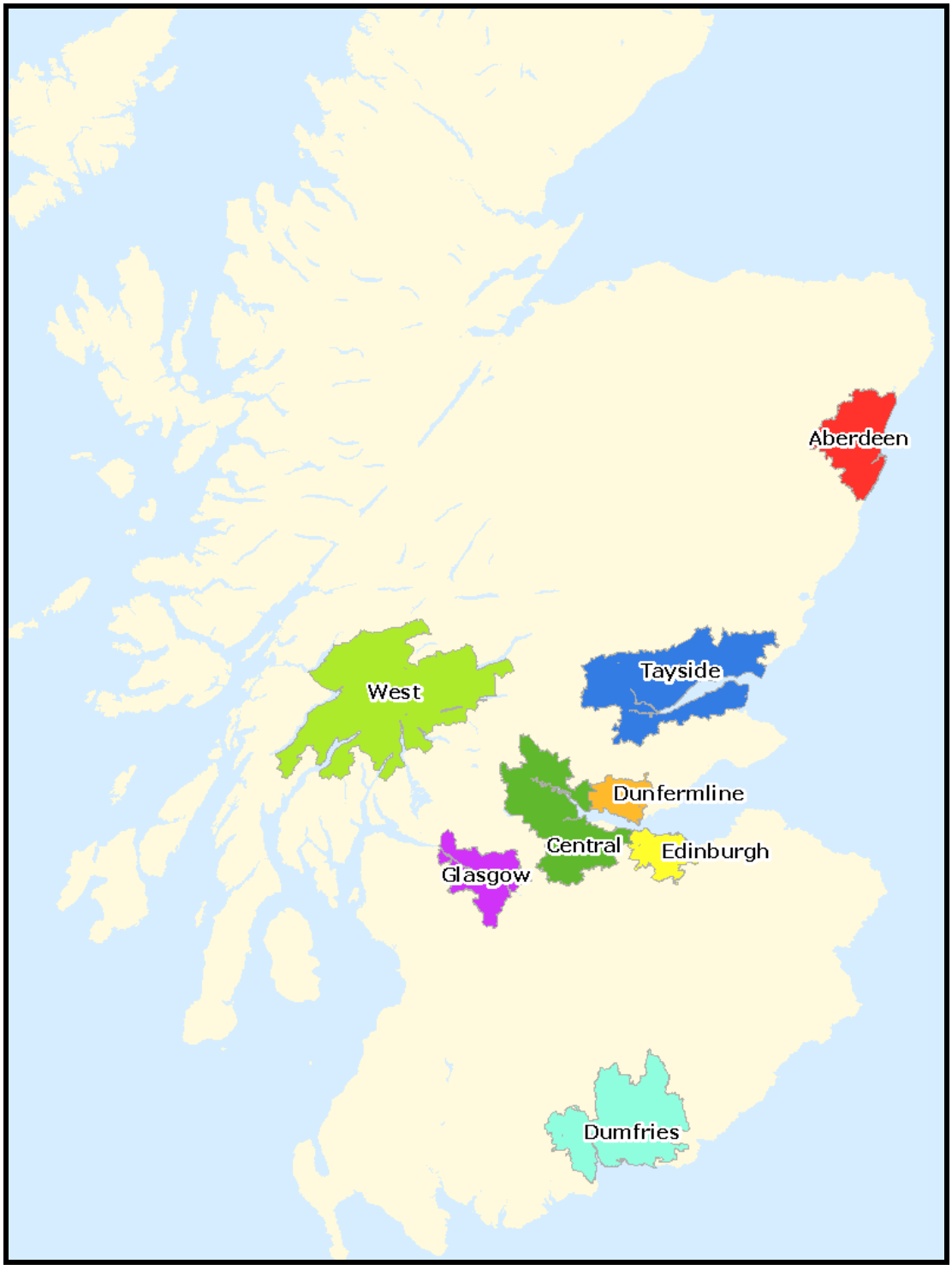

Figure 2.1 Count Uplift Areas

Trip End Data

2.3.6 Trip end data are the total number of trips travelling to and from each zone in the model. For the purpose of Road Model matrix estimation procedures, the trip end data was extracted from the prior trip matrices and given 30% confidence level for the internal zones, ie one to 712 inclusive, and 20% for the external zones, ie 713 to 720 inclusive.

Prior Trip Matrix

2.3.7 The prior trip matrix used in the estimation process is as described in the Demand Model Development report. A confidence of 80% in the travel pattern was applied. This high confidence level is appropriate given the quality of the input data used to build the prior matrices.

Traveller Paths

2.3.8 CUBE ANALYST requires a set of traveller paths from the Road Model, in order to work out which part of the demand matrix to adjust in order to improve the match with a given screenline count. The average AM and average PM Peak hours used a set of Car Non-Work Commute (CNWc) traveller paths, whereas the Average Inter Peak hour used a set of Car Non-Work Other (CNWo) traveller paths. This was appropriate given the nature of the travel purpose in these time periods.

2.4 Matrix Estimation Procedure

2.4.1 A road assignment was carried out using the Base Year Road network and the prior demand matrix to create the intercept (ICP) and screenline files. The assignment was carried out using the HIGHWAY module (Chapter 4 of the TMfS:07 National Road Model Development report discusses the assignment procedure in detail). Thereafter, the estimated matrix from the previous ANALYST run was used to create the next ICP file. Note that to improve run times, the ICP File contains ALL traveller paths crossing the calibration screenlines.

2.4.2 The trip end data (with its associated confidence level), prior matrix travel pattern confidence and screenline files remained 'fixed' throughout the procedure; the only variables being the estimated matrix and the ICP file.

2.4.3 The traveller paths used in the estimation process were representative of the best traveller paths available after a run of the Road Model with the previous estimated matrix. ANALYST and the Road Model were run iteratively with successively improving paths being fed into the ANALYST program until a satisfactory estimated matrix was achieved.

2.4.4 Initially, focus was given to the calibration of total screenline flows, and once a reasonable match was produced, a number of individual site locations were added to the calibration process to produce a finer level of calibration across the strategic road network. These locations are illustrated in Appendix B.

2.4.5 The above procedure was carried out for all three time periods, ie AM Peak, Average Inter-Peak and PM Peak hours.

2.4.6 Figure 2.2 illustrates the matrix estimation process and interactions with relevant input data.

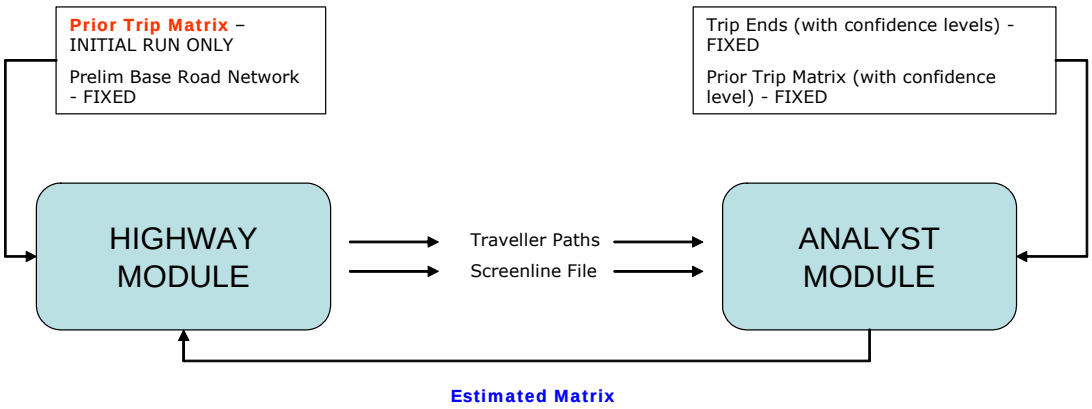

Figure 2.2 Matrix Estimation Procedure

2.5 Demand Matrix Comparisons

2.5.1 The resultant matrices generated from the matrix estimation procedure are presented in a series of tables in Appendix C of this report. A 16 sector system was defined for reporting matrix results and this sector system is illustrated in Figure 2.3 overleaf.

2.5.2 Some key points of interest from inspection of the sectored matrices are as follows:

- the change in the overall matrix totals for all three time period specific matrices from the Prior matrices (before matrix estimation) to the Final matrices (after matrix estimation) is relatively small;
- the matrix estimation procedure has provided an overall improvement in the match of modelled total PCU flows to total PCU count at an aggregate level within the vast majority of the 16 sectors;
- for the AM and PM time periods, the largest **increase** in total PCUs is for movements within Ayrshire, while for inter-peak it is Fife. This is in line with matrix estimation targets for the relevant sectors; and
- in the AM Peak hour the largest **decrease** in total PCUs is for movements within the City of Aberdeen; in the Inter Peak hour the largest **decrease** in total PCUs is for Strathclyde to City of Glasgow movements; the largest **decrease** in total PCUs in the PM Peak hour sees the reverse of this movement. Once again, this is in line with matrix estimation targets.

2.5.3 Appendix D provides a summary of the comparison of modelled versus observed counts at the end of the matrix estimation process, by geographic area and time period.

2.5.4 Some key points of interest to note are:

- aggregations of screenlines in City of Glasgow (3%-9%), City of Aberdeen (5%-15%), and The Borders (2%-11%) have the largest positive percentage differences between the observed and modelled totals (ie over-estimation in the model) in all time periods; and
- An aggregation of Argyll & Bute screenlines has the largest negative percentage difference between modelled and observed screenline totals (under-estimation in the

model) in all time periods (12%-23%) however it should be noted that this is based solely on one link count and therefore is not strictly 'aggregate.' Other noticeably large negative percentage differences include England & Wales (12%-16%) and Perthshire & Kinross (6%-10%).

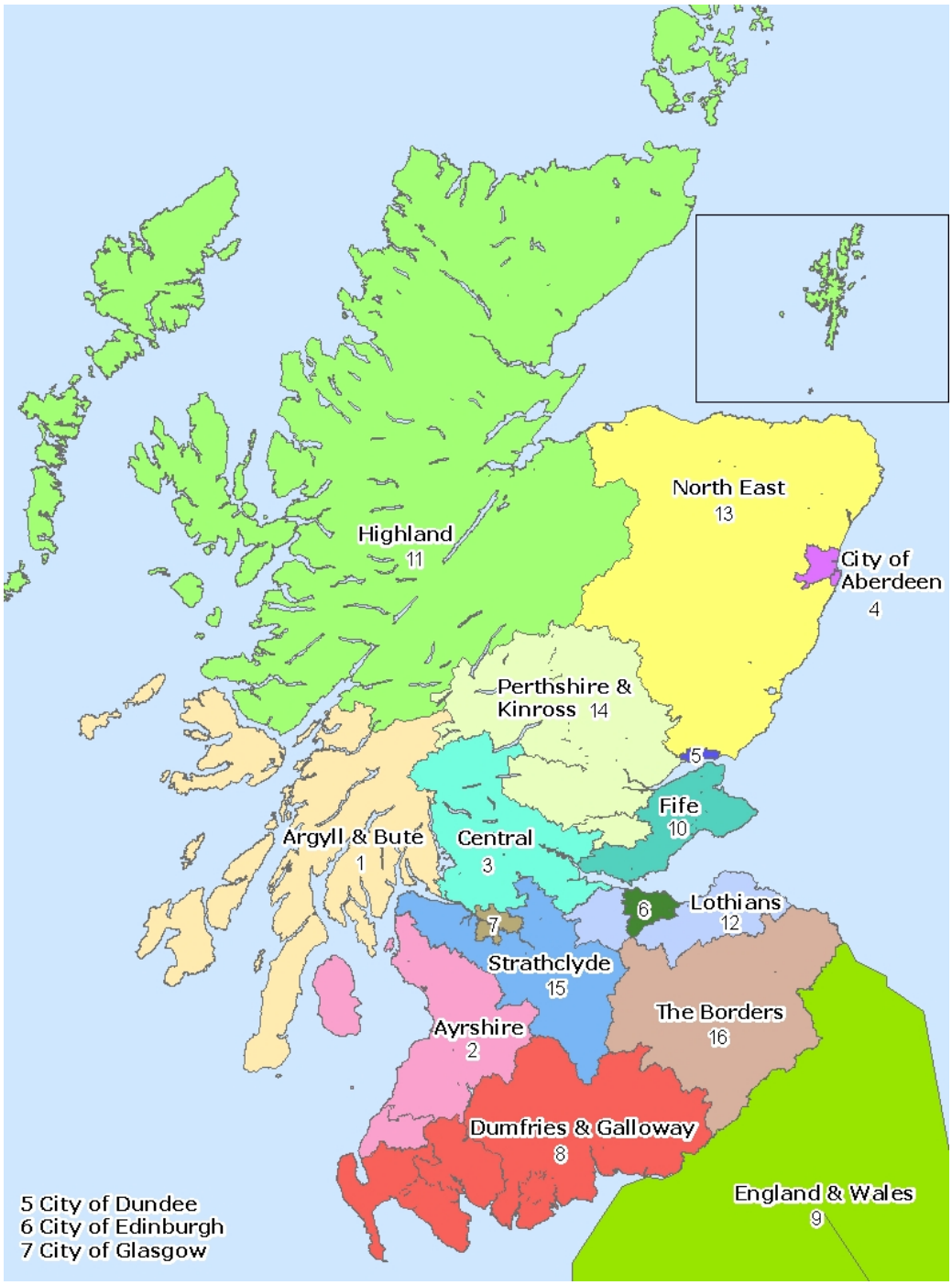

Figure 2.3 16 Sector Definition Map

2.6 Trip Length Distribution Analysis

2.6.1 Analysis of total PCU Trip Length Distribution before and after matrix estimation for each modelled time period is shown in Appendix E of this report.

2.6.2 There are six graphs for each time period; one which illustrates total PCU trips over a distance of 100km and five showing total PCU trip length in 20km distance bands up to 100km. The 0km – 100km distance band was chosen since between 80% and 85% of total PCU trips for all time periods lie in this distance band.

2.6.3 For each graph there are two trip length distributions shown. The first is the prior assignment matrix (**before** matrix estimation) and the second is the final assignment matrix (**after** matrix estimation).

2.6.4 The key conclusion from the trip length distribution analysis is that the matrix estimation process has not altered trip length distribution significantly in any of the three time periods.

2.7 GEH Statistic

2.7.1 Focus on either absolute differences or percentage differences alone can be misleading when there is a wide range of observed flows. For example, a difference of 50 PCUs is more significant on a link with an observed flow of 100 PCUS than on one with 1000 PCUs, while a 10% discrepancy on an observed flow of 100 vehicles is less important than a 10% mismatch on an observed flow of 1,000 PCUs.

2.7.2 To avoid this difficulty, a standard summary statistic known as the GEH score is used. This statistic is designed to focus attention on significant absolute differences at low flows and significant percentage differences at high flows.

2.7.3 The GEH Statistic is defined as:

$$GEH = \sqrt{\frac{(M-C)^2}{(M+C) \div 2}}$$

where

GEH is the GEH statistic;

M is the Modelled Flow; and

C is the Observed Count.

2.8 DMRB Total Screenline Calibration Criteria

2.8.1 As described in the introduction to this chapter, each of the calibration screenlines was made up of a 'set' of road links and thus the screenlines represent an aggregate of a number of traffic counts (total screenlines).

2.8.2 Total screenline results have been presented in the following section with reference to DMRB[3] criteria, providing a guideline to the overall robustness of modelled total screenline flows.

2.8.3 DMRB criteria and guidelines are as follows:

Total Screenline Flows

"Total screenline flows (normally > 5 links) to be within 5% for all (or nearly all) screenlines."

GEH Statistic

"GEH Statistic: screenline totals GEH < 4 for all (or nearly all) screenlines."

2.8.4 Note that the DMRB GEH-related criteria relate to **vehicle** traffic flows, but have been applied here to total PCUs flows. This will have had the impact of making the GEH-related criteria harder to meet than implied by the DMRB criteria. The GEH has units of the square root of the traffic demand, so if PCU flows are (1+p) times vehicle flows, then the corresponding GEH statistic will have been increased by a factor of √(1+p).

2.8.5 Furthermore, the discussion in Paragraph 1.2 of this report should also be noted when considering DMRB guidance in relation to the National Road Model.

2.9 Strategic Screenline Total PCU Traffic Flows

2.9.1 This section presents the calibration results for all strategic screenlines. Tables 2.1 to 2.3 highlight the post matrix estimation screenline results (ie final assigned / loaded road network total PCU traffic flows) for the AM Peak, Inter Peak and PM Peak hours respectively. Note that the reverse direction of screenline 1 is 101, the reverse direction of screenline 2 is 201 and so on.

2.9.2 The highlighted GEH cells indicate which GEH band the statistic falls into:

Green cells: GEH < 4;

Amber cells: GEH >= 4 & <7; and

Red cells: GEH >= 7.

2.9.3 Tables 2.1 to 2.3 generally illustrate a mixed picture of traffic flow comparisons across the various geographical locations and time periods used within the calibration process. This mixture of results includes modelled flows that lie both higher and lower than observed traffic count data, which generally produces around an overall 50/50 split of % changes falling within the +/- 5% difference outlined by the DMRB.

2.9.4 However, using the GEH statistic the analysis indicates that the majority of modelled flows fall within the (GEH of <4) criteria set by the DMRB, with the model only displaying a few higher-end GEH values.

[3] Source: http://www.standardsforhighways.co.uk/dmrb/vol12/section2/12s2p1.pdf - paragraph 4.4.43

2.9.5 In terms of the GEH statistic, there are two locations in the AM Peak, three locations in the Inter Peak and six locations in the PM peak that record a GEH of > 10. For specific locations reasons behind these differences are discussed below.

Table 2.1 AM Peak Hour Total PCU Screenline Calibration

Screenline No.	Screenline Area	Direction	Observed Total PCU Count	Modelled Total PCU Count	Difference	% Diff.	GEH	Within +/- 5%
1	ABERDEEN	NB	1,830	2,479	649	35%	13.98	No
101	ABERDEEN	SB	3,600	3,794	194	5%	3.20	No
2	ABERDEEN	EB	2,629	2,693	64	2%	1.24	Yes
201	ABERDEEN	WB	1,594	1,693	99	6%	2.43	No
3	ABERDEEN	NB	2,613	2,526	-87	-3%	1.71	Yes
301	ABERDEEN	SB	779	828	49	6%	1.73	No
8	EDINBURGH	SB	10,931	11,037	106	1%	1.01	Yes
801	EDINBURGH	NB	7,536	8,099	563	7%	6.37	No
9	EDINBURGH	SB	4,313	4,019	-295	-7%	4.57	No
901	EDINBURGH	NB	6,216	5,843	-372	-6%	4.79	No
10	EDINBURGH	EB	2,080	1,948	-132	-6%	2.94	No
1001	EDINBURGH	WB	2,901	2,859	-42	-1%	0.79	Yes
11	EDINBURGH	EB	3,186	3,400	214	7%	3.73	No
1101	EDINBURGH	WB	3,508	3,988	479	14%	7.83	No
12	EDINBURGH	NB	5,724	5,911	187	3%	2.45	Yes
1201	EDINBURGH	SB	7,039	7,256	217	3%	2.57	Yes
13	EDINBURGH	EB	1,447	1,504	57	4%	1.48	Yes
1301	EDINBURGH	WB	1,172	1,209	37	3%	1.08	Yes
14	EDINBURGH	EB	4,361	4,322	-39	-1%	0.59	Yes
1401	EDINBURGH	WB	4,483	4,549	67	1%	0.99	Yes
15	GLASGOW	NB	2,379	2,519	140	6%	2.83	No
1501	GLASGOW	SB	3,730	4,269	539	14%	8.52	No
16	GLASGOW	EB	4,534	4,549	15	0%	0.22	Yes
1601	GLASGOW	WB	2,953	3,577	624	21%	10.93	No
17	GLASGOW	WB	3,306	3,257	-49	-1%	0.86	Yes
1701	GLASGOW	EB	2,555	2,422	-133	-5%	2.67	No
18	GLASGOW	EB	5,239	5,128	-111	-2%	1.54	Yes
1801	GLASGOW	WB	4,825	5,212	387	8%	5.46	No
19	GLASGOW	EB	3,767	4,040	273	7%	4.36	No
1901	GLASGOW	WB	5,186	5,423	237	5%	3.25	Yes
20	GLASGOW	NB	8,128	7,714	-414	-5%	4.65	No
2001	GLASGOW	SB	4,888	5,320	433	9%	6.05	No
21	GLASGOW	EB	5,573	5,478	-95	-2%	1.28	Yes
2101	GLASGOW	WB	4,793	4,593	-200	-4%	2.92	Yes
22	GLASGOW	NB	15,839	15,420	-419	-3%	3.35	Yes
2201	GLASGOW	SB	11,907	11,854	-53	0%	0.48	Yes
23	GLASGOW	EB	5,479	5,289	-190	-3%	2.60	Yes
2301	GLASGOW	WB	5,791	6,357	566	10%	7.26	No
25	CENTRAL & TAYSIDE	EB	4,877	4,643	-234	-5%	3.39	Yes
2501	CENTRAL & TAYSIDE	WB	3,776	4,016	240	6%	3.84	No
27	CENTRAL & TAYSIDE	EB	2,759	2,612	-147	-5%	2.84	No
2701	CENTRAL & TAYSIDE	WB	2,171	2,045	-126	-6%	2.75	No
28	CENTRAL & TAYSIDE	NB	3,688	3,617	-71	-2%	1.18	Yes
2801	CENTRAL & TAYSIDE	SB	2,074	2,049	-25	-1%	0.55	Yes
29	SOUTH	EB	2,547	2,574	27	1%	0.54	Yes
2901	SOUTH	WB	2,941	3,069	128	4%	2.34	Yes
30	SOUTH	NB	1,081	943	-138	-13%	4.34	No
3001	SOUTH	SB	1,005	868	-137	-14%	4.47	No
31	SOUTH	SB	818	736	-82	-10%	2.96	No
3101	SOUTH	NB	1,050	1,086	36	3%	1.10	Yes
32	HIGHLAND	NB	392	441	49	13%	2.41	No
3201	HIGHLAND	SB	348	379	31	9%	1.62	No
33	WEST	EB	185	163	-22	-12%	1.67	No
3301	WEST	WB	209	183	-26	-13%	1.87	No
34	WEST	EB	2,138	2,066	-72	-3%	1.57	Yes
3401	WEST	WB	1,846	1,690	-156	-8%	3.71	No
35	SOUTH	NB	597	616	19	3%	0.76	Yes
3501	SOUTH	SB	307	386	79	26%	4.23	No
36	HIGHLAND	EB	635	620	-15	-2%	0.58	Yes
3601	HIGHLAND	WB	1,074	1,131	57	5%	1.72	No
37	HIGHLAND	EB	865	976	111	13%	3.65	No
3701	HIGHLAND	WB	892	807	-85	-9%	2.91	No
38	HIGHLAND	NB	1,121	1,080	-41	-4%	1.23	Yes
3801	HIGHLAND	SB	1,786	1,797	11	1%	0.26	Yes
39	HIGHLAND	EB	914	832	-82	-9%	2.79	No
3901	HIGHLAND	WB	1,056	1,225	169	16%	4.99	No
40	CENTRAL & TAYSIDE	WB	1,848	1,899	51	3%	1.17	Yes
4001	CENTRAL & TAYSIDE	EB	1,263	1,339	77	6%	2.12	No
41	CENTRAL & TAYSIDE	EB	4,301	4,340	39	1%	0.60	Yes
4101	CENTRAL & TAYSIDE	WB	3,175	2,984	-191	-6%	3.45	No
42	SOUTH	WB	6,247	6,307	60	1%	0.76	Yes
4201	SOUTH	EB	6,126	5,934	-192	-3%	2.47	Yes
43	SOUTH	WB	3,741	3,789	48	1%	0.78	Yes
4301	SOUTH	EB	4,376	3,850	-526	-12%	8.20	No
44	SOUTH	NB	1,193	1,029	-164	-14%	4.92	No
4401	SOUTH	SB	1,187	979	-208	-18%	6.33	No
45	SOUTH	NB	141	182	41	29%	3.25	No
4501	SOUTH	SB	180	158	-22	-12%	1.71	No
46	SOUTH	NB	49	36	-13	-26%	1.94	No
4601	SOUTH	SB	51	38	-13	-25%	1.93	No
47	SOUTH	NB	83	53	-30	-36%	3.62	No
4701	SOUTH	SB	62	52	-10	-16%	1.33	No
48	SOUTH	EB	166	164	-2	-1%	0.14	Yes
4801	SOUTH	WB	148	162	14	10%	1.14	No
49	SOUTH	NB	304	318	14	4%	0.77	Yes
4901	SOUTH	SB	316	343	27	9%	1.50	No

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Table 2.2 Inter Peak Hour Total PCU Screenline Calibration

Screenline No.	Screenline Area	Direction	Observed Total PCU Count	Modelled Total PCU Count	Difference	% Diff.	GEH	Within +/- 5%
1	ABERDEEN	NB	2,064	2,041	-23	-1%	0.50	Yes
101	ABERDEEN	SB	2,045	2,078	33	2%	0.73	Yes
2	ABERDEEN	EB	1,216	1,286	70	6%	1.98	No
201	ABERDEEN	WB	1,308	1,357	49	4%	1.35	Yes
3	ABERDEEN	NB	1,271	1,212	-59	-5%	1.68	Yes
301	ABERDEEN	SB	1,187	1,234	47	4%	1.35	Yes
8	EDINBURGH	SB	6,177	6,116	-61	-1%	0.78	Yes
801	EDINBURGH	NB	6,505	6,824	319	5%	3.91	Yes
9	EDINBURGH	SB	3,542	3,484	-58	-2%	0.97	Yes
901	EDINBURGH	NB	3,269	3,404	135	4%	2.34	Yes
10	EDINBURGH	EB	2,106	1,987	-119	-6%	2.64	No
1001	EDINBURGH	WB	1,940	1,888	-52	-3%	1.18	Yes
11	EDINBURGH	EB	2,616	2,676	60	2%	1.17	Yes
1101	EDINBURGH	WB	2,722	2,708	-14	-1%	0.27	Yes
12	EDINBURGH	NB	4,313	4,483	170	4%	2.57	Yes
1201	EDINBURGH	SB	4,424	4,533	109	2%	1.63	Yes
13	EDINBURGH	EB	813	914	101	12%	3.43	No
1301	EDINBURGH	WB	742	822	80	11%	2.85	No
14	EDINBURGH	EB	3,397	3,348	-49	-1%	0.84	Yes
1401	EDINBURGH	WB	3,395	3,199	-196	-6%	3.41	No
15	GLASGOW	NB	2,323	2,628	305	13%	6.13	No
1501	GLASGOW	SB	2,196	2,579	383	17%	7.84	No
16	GLASGOW	EB	2,765	3,329	564	20%	10.22	No
1601	GLASGOW	WB	2,460	3,008	548	22%	10.48	No
17	GLASGOW	WB	2,183	2,184	1	0%	0.02	Yes
1701	GLASGOW	EB	2,141	2,129	-12	-1%	0.26	Yes
18	GLASGOW	EB	4,851	4,787	-64	-1%	0.91	Yes
1801	GLASGOW	WB	3,720	3,890	170	5%	2.76	Yes
19	GLASGOW	EB	2,699	3,379	680	25%	12.33	No
1901	GLASGOW	WB	2,856	3,298	442	15%	7.98	No
20	GLASGOW	NB	4,979	4,998	19	0%	0.27	Yes
2001	GLASGOW	SB	4,936	5,364	428	9%	5.97	No
21	GLASGOW	EB	3,951	4,046	95	2%	1.50	Yes
2101	GLASGOW	WB	4,022	4,048	26	1%	0.40	Yes
22	GLASGOW	NB	10,688	10,481	-207	-2%	2.02	Yes
2201	GLASGOW	SB	9,878	9,984	106	1%	1.06	Yes
23	GLASGOW	EB	4,673	4,816	143	3%	2.08	Yes
2301	GLASGOW	WB	4,383	4,691	308	7%	4.58	No
25	CENTRAL & TAYSIDE	EB	2,949	3,025	76	3%	1.40	Yes
2501	CENTRAL & TAYSIDE	WB	3,156	3,237	81	3%	1.43	Yes
27	CENTRAL & TAYSIDE	EB	2,132	1,929	-203	-10%	4.51	No
2701	CENTRAL & TAYSIDE	WB	2,234	2,068	-166	-7%	3.57	No
28	CENTRAL & TAYSIDE	NB	1,851	1,779	-72	-4%	1.68	Yes
2801	CENTRAL & TAYSIDE	SB	2,049	1,955	-94	-5%	2.09	Yes
29	SOUTH	EB	2,271	2,464	193	8%	3.96	No
2901	SOUTH	WB	2,324	2,465	141	6%	2.89	No
30	SOUTH	NB	1,071	891	-180	-17%	5.75	No
3001	SOUTH	SB	1,293	1,132	-161	-12%	4.61	No
31	SOUTH	SB	787	738	-49	-6%	1.78	No
3101	SOUTH	NB	797	757	-40	-5%	1.45	No
32	HIGHLAND	NB	435	481	46	11%	2.17	No
3201	HIGHLAND	SB	472	446	-26	-5%	1.21	No
33	WEST	EB	279	218	-61	-22%	3.86	No
3301	WEST	WB	257	194	-63	-25%	4.23	No
34	WEST	EB	1,343	1,333	-10	-1%	0.28	Yes
3401	WEST	WB	1,572	1,484	-88	-6%	2.26	No
35	SOUTH	NB	298	301	3	1%	0.16	Yes
3501	SOUTH	SB	330	319	-11	-3%	0.62	Yes
36	HIGHLAND	EB	496	487	-9	-2%	0.42	Yes
3601	HIGHLAND	WB	534	688	154	29%	6.24	No
37	HIGHLAND	EB	515	730	215	42%	8.61	No
3701	HIGHLAND	WB	532	564	32	6%	1.36	No
38	HIGHLAND	NB	1,131	1,095	-36	-3%	1.07	Yes
3801	HIGHLAND	SB	1,281	1,318	37	3%	1.03	Yes
39	HIGHLAND	EB	830	799	-31	-4%	1.07	Yes
3901	HIGHLAND	WB	892	983	91	10%	2.98	No
40	CENTRAL & TAYSIDE	WB	268	281	13	5%	0.79	Yes
4001	CENTRAL & TAYSIDE	EB	289	278	-11	-4%	0.63	Yes
41	CENTRAL & TAYSIDE	EB	2,529	2,662	133	5%	2.61	No
4101	CENTRAL & TAYSIDE	WB	2,785	2,605	-180	-6%	3.46	No
42	SOUTH	WB	4,264	4,540	276	6%	4.17	No
4201	SOUTH	EB	4,171	3,997	-174	-4%	2.73	Yes
43	SOUTH	WB	2,214	2,249	35	2%	0.74	Yes
4301	SOUTH	EB	2,254	2,212	-42	-2%	0.88	Yes
44	SOUTH	NB	1,248	1,033	-215	-17%	6.36	No
4401	SOUTH	SB	1,428	1,233	-195	-14%	5.34	No
45	SOUTH	NB	144	147	3	2%	0.25	Yes
4501	SOUTH	SB	131	157	26	20%	2.16	No
46	SOUTH	NB	144	103	-41	-28%	3.66	No
4601	SOUTH	SB	116	83	-33	-28%	3.31	No
47	SOUTH	NB	120	125	5	4%	0.43	Yes
4701	SOUTH	SB	135	120	-15	-11%	1.32	No
48	SOUTH	EB	172	246	74	43%	5.11	No
4801	SOUTH	WB	169	252	83	49%	5.75	No
49	SOUTH	NB	415	412	-3	-1%	0.15	Yes
4901	SOUTH	SB	399	422	23	6%	1.12	No

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Table 2.3 PM Peak Hour Total PCU Screenline Calibration

Screenline No.	Screenline Area	Direction	Observed Total PCU Count	Modelled Total PCU Count	Difference	% Diff.	GEH	Within +/- 5%
1	ABERDEEN	NB	4,104	4,108	4	0%	0.05	Yes
101	ABERDEEN	SB	2,393	2,757	364	15%	7.18	No
2	ABERDEEN	EB	1,832	1,837	5	0%	0.12	Yes
201	ABERDEEN	WB	2,587	2,662	75	3%	1.46	Yes
3	ABERDEEN	NB	1,409	1,378	-31	-2%	0.83	Yes
301	ABERDEEN	SB	2,043	2,214	171	8%	3.70	No
8	EDINBURGH	SB	8,120	8,362	242	3%	2.66	Yes
801	EDINBURGH	NB	10,239	10,976	737	7%	7.15	No
9	EDINBURGH	SB	6,330	6,138	-192	-3%	2.43	Yes
901	EDINBURGH	NB	3,954	4,109	155	4%	2.44	Yes
10	EDINBURGH	EB	3,539	3,250	-289	-8%	4.96	No
1001	EDINBURGH	WB	2,118	2,103	-15	-1%	0.33	Yes
11	EDINBURGH	EB	3,686	4,342	656	18%	10.35	No
1101	EDINBURGH	WB	3,433	3,678	245	7%	4.11	No
12	EDINBURGH	NB	7,448	7,498	50	1%	0.58	Yes
1201	EDINBURGH	SB	5,769	5,833	64	1%	0.84	Yes
13	EDINBURGH	EB	1,120	1,355	235	21%	6.68	No
1301	EDINBURGH	WB	1,075	1,177	102	9%	3.03	No
14	EDINBURGH	EB	4,998	5,020	22	0%	0.32	Yes
1401	EDINBURGH	WB	4,900	4,568	-332	-7%	4.83	No
15	GLASGOW	NB	3,598	4,321	723	20%	11.49	No
1501	GLASGOW	SB	2,365	3,094	729	31%	13.95	No
16	GLASGOW	EB	3,464	4,132	668	19%	10.84	No
1601	GLASGOW	WB	3,670	4,243	573	16%	9.11	No
17	GLASGOW	WB	2,744	2,616	-128	-5%	2.46	Yes
1701	GLASGOW	EB	3,140	3,208	68	2%	1.21	Yes
18	GLASGOW	EB	6,626	6,935	309	5%	3.76	Yes
1801	GLASGOW	WB	4,148	4,595	447	11%	6.77	No
19	GLASGOW	EB	4,761	5,637	876	18%	12.15	No
1901	GLASGOW	WB	4,235	5,046	811	19%	11.91	No
20	GLASGOW	NB	6,077	6,001	-76	-1%	0.97	Yes
2001	GLASGOW	SB	8,554	9,102	548	6%	5.83	No
21	GLASGOW	EB	4,657	4,644	-13	0%	0.19	Yes
2101	GLASGOW	WB	5,704	5,934	230	4%	3.02	Yes
22	GLASGOW	NB	12,073	12,220	147	1%	1.33	Yes
2201	GLASGOW	SB	14,628	15,231	603	4%	4.93	Yes
23	GLASGOW	EB	5,583	6,139	556	10%	7.27	No
2301	GLASGOW	WB	4,461	5,113	652	15%	9.42	No
25	CENTRAL & TAYSIDE	EB	4,139	4,176	37	1%	0.57	Yes
2501	CENTRAL & TAYSIDE	WB	4,592	4,641	49	1%	0.73	Yes
27	CENTRAL & TAYSIDE	EB	2,445	2,305	-140	-6%	2.87	No
2701	CENTRAL & TAYSIDE	WB	2,909	2,857	-52	-2%	0.97	Yes
28	CENTRAL & TAYSIDE	NB	2,378	2,319	-59	-2%	1.22	Yes
2801	CENTRAL & TAYSIDE	SB	3,199	3,166	-33	-1%	0.59	Yes
29	SOUTH	EB	2,893	3,123	230	8%	4.19	No
2901	SOUTH	WB	2,555	2,648	93	4%	1.82	Yes
30	SOUTH	NB	1,300	1,167	-133	-10%	3.78	No
3001	SOUTH	SB	1,276	1,260	-16	-1%	0.45	Yes
31	SOUTH	SB	1,386	1,245	-141	-10%	3.89	No
3101	SOUTH	NB	1,026	913	-113	-11%	3.62	No
32	HIGHLAND	NB	483	519	36	7%	1.60	No
3201	HIGHLAND	SB	508	488	-20	-4%	0.91	Yes
33	WEST	EB	284	234	-50	-18%	3.10	No
3301	WEST	WB	276	208	-68	-25%	4.35	No
34	WEST	EB	2,072	2,018	-54	-3%	1.19	Yes
3401	WEST	WB	2,454	2,173	-281	-11%	5.84	No
35	SOUTH	NB	396	466	70	18%	3.38	No
3501	SOUTH	SB	645	624	-21	-3%	0.84	Yes
36	HIGHLAND	EB	1,095	1,012	-83	-8%	2.57	No
3601	HIGHLAND	WB	737	850	113	15%	4.00	No
37	HIGHLAND	EB	950	1,056	106	11%	3.34	No
3701	HIGHLAND	WB	990	1,007	17	2%	0.54	Yes
38	HIGHLAND	NB	1,785	1,731	-54	-3%	1.30	Yes
3801	HIGHLAND	SB	1,574	1,618	44	3%	1.09	Yes
39	HIGHLAND	EB	1,144	1,095	-49	-4%	1.45	Yes
3901	HIGHLAND	WB	989	1,120	131	13%	4.05	No
40	CENTRAL & TAYSIDE	WB	1,490	1,571	81	5%	2.08	No
4001	CENTRAL & TAYSIDE	EB	2,058	2,128	70	3%	1.54	Yes
41	CENTRAL & TAYSIDE	EB	3,356	3,157	-199	-6%	3.49	No
4101	CENTRAL & TAYSIDE	WB	4,765	4,517	-248	-5%	3.65	No
42	SOUTH	WB	6,189	6,275	86	1%	1.09	Yes
4201	SOUTH	EB	6,049	6,004	-45	-1%	0.58	Yes
43	SOUTH	WB	4,030	3,797	-233	-6%	3.72	No
4301	SOUTH	EB	4,856	4,485	-371	-8%	5.43	No
44	SOUTH	NB	1,543	1,346	-197	-13%	5.18	No
4401	SOUTH	SB	1,443	1,295	-148	-10%	3.99	No
45	SOUTH	NB	184	167	-17	-9%	1.28	No
4501	SOUTH	SB	176	195	19	11%	1.40	No
46	SOUTH	NB	126	76	-50	-40%	5.00	No
4601	SOUTH	SB	108	69	-39	-36%	4.10	No
47	SOUTH	NB	104	98	-6	-6%	0.63	No
4701	SOUTH	SB	128	97	-31	-24%	2.90	No
48	SOUTH	EB	159	246	87	55%	6.14	No
4801	SOUTH	WB	197	237	40	20%	2.70	No
49	SOUTH	NB	412	462	50	12%	2.40	No
4901	SOUTH	SB	355	429	74	21%	3.74	No

AM Peak Hour Differences

2.9.6 For screenline one (in the Aberdeen area), one of the traffic counts used for this screenline is located on a particularly busy stretch of the A947 at Stoneywood, where queues of traffic are a regularly occurrence. Generally the traffic observed during the Inter Peak and particularly the PM Peak at this location is higher than the traffic observed in the AM time period - suggesting generally higher traffic flows in this area than that recorded by the current AM Peak count data. Therefore, the modelled flows are likely to be providing a better reflection of traffic conditions at this location than the count data suggests.

2.9.7 For screenline 1601 (in the Glasgow area), a traffic count is located on the A82 just east of the B808 Byers Road junction. The models relatively coarse representation of Glasgow City Centre may tend to overestimate the level of city centre traffic routing west along the A82 (towards Clydebank for example), rather than the competing parallel A814 route - hence the consistent (AM, Inter and PM Peaks) over-estimation of traffic using the A82 westbound.

Inter Peak Hour Differences

2.9.8 Screenline 16 contains eastbound traffic into Glasgow and is the reverse of 1601. This screenline is made up of three routes (A814, A82 and Argyle Street) and the calibration suggests an imbalance of vehicles using these routes. The modelled flow is considerably higher than the observed count on the A814, whilst other screenline (16) locations produce lower modelled flows. Across the whole screenline there is an over-estimation of trips.

2.9.9 Screenline 19 (in the Glasgow area) is made up of a total of four screenline locations. For three of the locations (A724, A749 and B759), modelled flows show a slight over-estimation of trips compared to the observed data, resulting in a GEH of around 5. When a fourth location (M74) is added to make up the multipoint screenline, the modelled flow is again higher than the observed count, leading to an over-estimation across the total screenline. This over-estimation of traffic is likely due to the zone system coverage within this area.

PM Peak Hour Differences

2.9.10 Screenline 11 (in the Edinburgh area) demonstrates an over estimation of trips. Two locations (A720 City Bypass and B701) make up this screenline. Individually both locations record a modelled flow higher than the observed count. Due to the strategic nature of TMfS07, Braid Hills Drive has not been included within the road network, therefore limiting some of the local route choices within this area. This may result in the over estimation of traffic routing via screenline 11.

2.9.11 Screenline 15 (in the Glasgow area) and its reverse direction 1501 both demonstrate higher modelled flows than the observed counts. Each screenline is made up of four individual locations (A81, A803, A879, and Maryhill Road). The Glasgow city centre zone system provides direct access onto Maryhill Road, resulting in a shorter distance to access the A81 area - resulting in an over estimation of trips across this screenline.

2.9.12 Previous comments relating to screenlines 16 and 19 (and there reverse directions) are also relevant for the PM Peak time hour (ie that they record a higher modelled flow that the observed count data).

2.9.13 Table 2.4 provides a summary of the number and proportion of screenlines (both directions) that fall within various % differences compared to the observed count data. Table 2.5 provides a similar summary of screenlines that fall within the various GEH statistic bands.

Table 2.4 Summary of Total Screenline Percentage Change

Total % Bands	AM Peak Total Screenlines	% of TOTAL	Inter Peak Total Screenlines	% of TOTAL	PM Peak Total Screenlines	% of TOTAL
+/- 5%	37	43%	44	51%	36	42%
+/- 10%	64	74%	62	72%	55	64%
+/- 15%	76	88%	70	81%	67	78%
> +/- 15%	10	12%	16	19%	19	22%
TOTAL	**86**	**100%**	**86**	**100%**	**86**	**100%**

2.9.14 Table 2.4 illustrates that for total screenlines, 43% of modelled traffic flows in the AM Peak, 51% in the Inter Peak and 42% in the PM Peak lie within 5% of the observed traffic count.

2.9.15 This level of total screenline calibration does not meet the DMRB guidance which states that, 'Total screenline flows to be within 5% for all (or nearly all) screenlines'. However, as noted previously in this report, it should be noted that criteria set by the DMRB have been viewed in the past as stringent, especially for large strategic style models such as TMfS. Furthermore, given that a proportion of screenlines used within this analysis record a relatively low traffic flow, some of the higher % changes actually reflect only marginal changes in absolute traffic (ie <150 vehicles).

2.9.16 Using more relaxed criteria, where modelled flows are compared to within +/- 10% of the observed flow, the model produces a more positive comparison, with all time periods recording that over 60% of screenlines fall within this range. If this criteria is altered to exclude screenlines with relatively low traffic flows (<1,000 PCUs per hour), between 74% and 84% of screenlines lie within 10% of the observed traffic flow.

Table 2.5 Summary of Total Screenline GEH Statistic

GEH Ranges	AM Peak Total Screenlines	% of TOTAL	Inter Peak Total Screenlines	% of TOTAL	PM Peak Total Screenlines	% of TOTAL
<4	67	78%	67	78%	59	69%
4 – 7	13	15%	13	15%	16	19%
>7	6	7%	6	7%	11	12%
TOTAL	**86**	**100%**	**86**	**100%**	**86**	**100%**

2.9.17 Using the GEH statistic (which tends to focus calibration results on the main or heavily used roads), the model calibration provides a closer match to DMRB criteria, with between 69% and 78% of screenlines recording a GEH of less than 4. The AM Peak and Inter Peak hours display a particularly good match to observed traffic levels.

2.9.18 Again, this criterion could be described as fairly stringent, and by applying a slightly more relaxed target of a GEH<7, more than 85% of screenlines across all time periods fall within this range.

2.9.19 Therefore, the Road Model total screenline calibration has illustrated 'that nearly all screenlines lie '**within**' or '**close to**' the DMRB criteria of a GEH of <4'. This level of road model calibration is considered acceptable.

2.10 DMRB Individual Link Count Calibration / Validation Criteria

2.10.1 Individual links were used to supplement the calibration processes and DMRB[4] criteria were used to indicate the overall robustness of modelled individual link flows. For individual link flows DMRB criteria (with acceptable guideline in brackets) are as follows:

Individual Link Flows

1. Individual flows within 15% for flows 700 – 2,700 vph (>85% of cases);
2. Individual flows within 100 vph for flows < 700 vph (>85% of cases); and
3. Individual flows within 400 vph for flows > 2,700 vph (>85% of cases).

GEH Statistic

4. Individual Flows: GEH < 5 (>85% of cases)

2.10.2 Note that the DMRB GEH-related criteria relate to **vehicle** traffic flows, but have been applied here to **total PCUs** flows. This will have had the impact of making the GEH-related criteria harder to meet than implied by the DMRB criteria. The GEH has units of the square root of the traffic demand, so if PCU flows are (1+p) times vehicle flows, then the corresponding GEH statistic will have been increased by a factor of √(1+p).

2.11 Individual Calibration Points

2.11.1 As described in the introduction to Chapter 2, each of the screenlines was made up of a 'set' of road links and thus the screenlines represent an aggregate of a number of traffic counts.

2.11.2 The following section discusses how the modelled flows compare to traffic count data at individual points along the calibration screenlines. These individual link counts are used to assess the level of calibration in more detail, indicating the robustness of local route choice within the Road Model.

[4]Source: http://www.standardsforhighways.co.uk/dmrb/vol12/section2/12s2p1.pdf - paragraph 4.4.43

2.11.3 Individual network calibration points are illustrated in Appendix B and a full comparison of modelled total PCU flows and observed total PCU traffic counts for all 273 sites (both directions considered) are contained in Appendix G.

2.11.4 Table 2.6 provides a summary of the level of calibration achieved at individual locations for the AM, Inter and PM Peak time periods.

Table 2.6 Summary of Individual Link Count GEH Statistic

GEH Ranges	AM Peak No. of Links	% of Total	Inter Peak No. of Links	% of Total	PM Peak No. of Links	% of Total
0 – 5	189	69%	186	70%	169	62%
5 – 7	37	14%	42	16%	45	17%
7 – 10	23	8%	23	9%	33	12%
10 – 15	16	6%	9	3%	20	7%
15+	8	3%	7	3%	6	2%
TOTAL	**273**	**100%**	**267**	**100%**	**273**	**100%**

2.11.5 Table 2.6 indicates that (across all time periods) between 62% and 69% of individual calibration points record a GEH <5. Although this does not reflect specific DMRB criteria, ie >85% of individual flows to have a GEH<5, if the range of GEH is extended to <7, 83% of locations in the AM Peak time period, 86% within the Inter Peak and 79% within the PM Peak time period fall within this range.

2.11.6 Therefore, and with consideration of the scale and nature of TMfS:07, the calibration of individual link flow locations indicates that the Road Model is in fact close to matching the level of calibration set by the DMRB, particularly within the AM Peak and Inter Peak time periods.

2.11.7 Tables 2.7-2.9 describe GEH ranges for each time period which individual count locations by road type fall within.

Table 2.7 AM Peak hour GEH Band by Road Type

GEH Ranges	AM Peak Trunk Roads	% of Total	AM Peak Non Trunk A Roads	% of Total	AM Peak B Roads	% of Total
0 – 5	89	82%	67	62%	33	59%
5 – 7	13	12%	18	17%	6	11%
7 – 10	6	6%	10	9%	7	13%
10 – 15	1	1%	8	7%	7	13%
15+	0	0%	5	5%	3	5%
TOTAL	**109**	**100%**	**108**	**100%**	**56**	**100%**

2.11.8 For the **AM Peak**, key points of interest to note are:

- 82% of individual calibration count locations on trunk roads (including motorways) exhibit a GEH <5 (over 90% exhibit a GEH<7) for all time periods, with no trunk roads exhibiting a GEH>15;
- 62% of individual calibration count locations on non-trunk A Roads exhibit a GEH <5 (79% exhibit a GEH<7);
- 12% (13 out of 108 locations) of individual calibration count locations on non-trunk A Roads exhibit a GEH>10;
- 59% of individual calibration count locations on B Roads exhibit a GEH <5 (70% exhibit a GEH<7); and
- 18% (10 out of 56 locations) of individual calibration count locations on B Roads exhibit a GEH>10.

Table 2.8 Average Inter Peak hour GEH Band by Road Type

GEH Ranges	Inter Peak Trunk Roads	% of Total	Inter Peak Non Trunk A Roads	% of Total	Inter Peak B Roads	% of Total
0 – 5	89	82%	61	60%	36	64%
5 – 7	15	14%	19	19%	8	14%
7 – 10	4	4%	12	12%	7	13%
10 – 15	1	1%	5	5%	3	5%
15+	0	0%	5	5%	2	4%
TOTAL	**109**	**100%**	**102**	**100%**	**56**	**100%**

2.11.9 For the Inter Peak modelled time period, key points of interest to note are:

- 82% of individual calibration locations on trunk roads (including motorways) exhibit a GEH <5 (over 90% exhibit a GEH<7), with no trunk roads exhibiting a GEH>15;
- 60% of individual calibration count locations on non-trunk A Roads exhibit a GEH <5 (79% exhibit a GEH<7);
- 10% (10 out of 102 count locations) of individual calibration count locations on non-trunk A Roads exhibit a GEH>10;
- 64% of individual calibration count locations on B Roads exhibit a GEH <5 (78% exhibit a GEH<7); and
- 9% (5 out of 56 count locations) of individual calibration count locations on B Roads exhibit a GEH>10.

Table 2.9 PM Peak hour GEH Band by Road Type

GEH Ranges	PM Peak Trunk Roads	% of Total	PM Peak Non Trunk A Roads	% of Total	PM Peak B Roads	% of Total
0 – 5	86	79%	59	55%	24	43%
5 – 7	13	12%	19	18%	13	23%
7 – 10	7	6%	17	16%	9	16%
10 – 15	3	3%	9	8%	8	14%
15+	0	0%	4	4%	2	4%
TOTAL	**109**	**100%**	**108**	**100%**	**56**	**100%**

2.11.10 For the PM Peak, key points of interest to note are:

- 79% of individual calibration count locations on trunk roads (including motorways) exhibit a GEH <5 (over 90% exhibit a GEH<7), with no trunk roads exhibiting a GEH>15;
- 55% of individual calibration count locations on non-trunk A Roads exhibit a GEH <5 (73% exhibit a GEH<7);
- 12% (13 out of 108 count locations) of individual calibration count locations on non-trunk A Roads exhibit a GEH>10;
- 43% of individual calibration count locations on B Roads exhibit a GEH <5 (66% exhibit a GEH<7); and
- 18% (10 out of 56 count locations) of individual calibration count locations on B Roads exhibit a GEH>10.

2.11.11 Overall, the GEH analysis has indicated that it is the main roads within the model that demonstrate the highest level of calibration, and that this trend is consistent for all modelled time periods.

2.12 Total PCU Traffic Level on Screenlines by Geographical Area

2.12.1 To provide a more aggregate illustration of the level of calibration, the total modelled traffic flow crossing the calibration screenlines was disaggregated by geographical area. This analysis is highlighted in Tables 2.10-2.12 for each time period.

2.12.2 The tables indicate that Central & Tayside, South and West areas exhibit marginal under-estimations in total PCU traffic in all three time periods. Conversely, Highland, Aberdeen, Edinburgh and Glasgow areas exhibit marginal over-estimations in total PCU traffic in all three time periods.

2.12.3 Considering all calibration screenline areas, the net effect is a slight over-estimation (1%-3%) in total PCU traffic crossing the calibration screenlines. This analysis suggests that the TMfS:07 Road Model displays an appropriate level of calibration at the aggregate regional level.

2.12.4 However, it is recommended that users make a note of the relevant calibration level for their area before applying the model.

Table 2.10 AM Peak hour Total PCU Traffic Level by Geographical Area

Area	AM Peak hour Total PCU Count	AM Peak hour Total PCU Flow	% Difference
ABERDEEN	13,045	14,013	+7%
CENTRAL & TAYSIDE	2,9932	29,543	-1%
EDINBURGH	64,897	65,944	+2%
GLASGOW	100,871	102,419	+2%
HIGHLAND	9,083	9,288	+2%
SOUTH	34,715	33,672	-3%
WEST	4,378	4,102	-6%
TOTAL	**256,921**	**258,982**	**+1%**

Table 2.11 Inter Peak hour Total PCU Traffic Level by Geographical Area

Area	Inter Peak hour Total PCU Count	Inter Peak hour Total PCU Flow	% Difference
ABERDEEN	9,091	9,209	+1%
CENTRAL & TAYSIDE	20,242	19,821	-2%
EDINBURGH	45,961	46,387	+1%
GLASGOW	75,704	79,640	+5%
HIGHLAND	7,118	7,592	+7%
SOUTH	26,695	26,399	-1%
WEST	3,451	3,228	-6%
TOTAL	**188,262**	**192,276**	**+2%**

Table 2.12 PM Peak hour Total PCU Traffic Level by Geographical Area

Area	PM Peak hour Total PCU Count	PM Peak hour Total PCU Flow	% Difference
ABERDEEN	14,368	14,955	+4%
CENTRAL & TAYSIDE	31,331	30,837	-2%
EDINBURGH	66,729	68,407	+3%
GLASGOW	100,488	108,213	+8%
HIGHLAND	10,255	10,495	+2%
SOUTH	37,536	36,724	-2%
WEST	5,086	4,634	-9%
TOTAL	**265,793**	**274,265**	**+3%**

2.13 Modelled Flow Observed Count Correlation Analysis

2.13.1 Analysis of modelled flows versus observed counts is depicted in Appendix F of this report. Graphs showing a correlation between modelled flow and observed count for each of the three time periods are presented.

2.13.2 Each graph highlights the Best-fitting Linear Regression Line (**$Y = \theta X$**, where Y is the set of modelled flows and X is the set of observed link-counts) and the corresponding Correlation Coefficient (**R^2**).

2.13.3 DMRB guidance states: "The correlation coefficient (R) gives some measure of the goodness of model fit and the slope of the best-fit regression line through the origin indicates the extent to which modelled values are over or under estimated."[5]

2.13.4 The acceptable DMRB criterion is as follows (and noting that a value of 1.0 for both parameters represents a perfect fit and the square root of R^2 gives R):

- **(R)** acceptable values are above **0.95**; and
- **(θ)** acceptable values are between **0.9** and **1.1**.

Modelled Flow Observed Count Results

2.13.5 A similar pattern of results is achieved in all modelled time periods. There is a good representation of model fit (R = 0.98) in all time periods and only a very slight tendency

[5] Source: http://www.standardsforhighways.co.uk/dmrb/vol12/section2/12s2p1.pdf - paragraph 4.4.42

towards under-estimation (Y = 0.99X) in the AM and Inter Peak hours. Conversely, there is a very slight tendency towards over-estimation (Y = 1.03X) in the PM Peak hour.

2.14 Road Model Calibration Conclusions

2.14.1 This section outlines the conclusions from the Road Model calibration procedure.

Trip Length Distribution

The matrix estimation procedure highlights that the estimated matrix trip length distribution is similar to the 'prior' matrix in all three modelled time periods. Therefore, the calibration process has not significantly altered the observed distance travelled. This provides confidence in the adopted estimation procedure and in the quality of the input data sources.

Total Screenline Flows

2.14.2 The calibration results indicate that the Road Model has achieved a reasonable level of calibration at the aggregate screenline level across all three time periods. Although the model does not meet the (rather stringent) guidelines set by the DMRB, the results do suggest that nearly all screenlines lie within or close to the DMRB criteria of a GEH of <4 – with the model indicating that at least 85% of screenlines record a GEH <7.

Individual Calibration Points

2.14.3 At a more detailed level, the Road Model calibration has demonstrated that around 80% of individual calibration points record a GEH <7, suggesting a relatively close match to the criteria set by the DMRB, particularly within the AM Peak and Inter Peak time periods.

2.14.4 Within the calibration, some outliers have been identified and users should be mindful of these when considering applications of the model.

Traffic Level on Screenlines by Geographical Area

2.14.5 By cross-referencing the calibration analysis by geographical area, the reporting has indicated that the Road Model does not significantly under or over estimate total traffic flows at the aggregate regional level.

Flow / Count Correlation Analysis

2.14.6 There is a good representation of 'model fit' within all three time periods. In addition, there is only a slight tendency towards under-estimation of modelled total PCU values in the AM and Inter Peak hours and a slight tendency towards over-estimation of modelled total PCU values in the PM Peak hour. These variations are considered to be within reasonable and acceptable levels for a model of this type.

2.14.7 Overall, the calibration of the Road Model is considered reasonable and appropriate for a model of this scale and nature.

3 Validation of the National Road Model

3.1 Introduction

3.1.1 This chapter analyses the level of validation of the National Road Model. Validation is the process of checking how well the model compares with available data which is independent of the data used in the calibration process. The following aspects are considered:

- DMRB Link Count Validation Criteria;
- Total Traffic Flow Validation;
- Heavy Goods Vehicle Flow Validation;
- Traffic Flows on Scotland's Key Road Bridges;
- Journey Time Data;
- RSI Journey Length Analysis;
- RSI Trip Distribution Analysis;
- RSI Car In-Work & Car Non-Work Analysis;
- Demand Matrix Trip Ends & Planning Data Analysis; and
- Census Travel-to-Work & Car Non-Work Commuter Traffic Analysis.

3.2 DMRB Link Count Validation Criteria

3.2.1 Individual links have been used for validation purposes and DMRB[6] criteria were used as a benchmark to indicate the overall robustness of modelled individual link flows. For individual link flows DMRB criteria (with acceptable guideline in brackets) are as follows:

Individual Link Flows

1. Individual flows within 15% for flows 700 – 2,700 vph (>85% of cases);
2. Individual flows within 100 vph for flows < 700 vph (>85% of cases) and;
3. Individual flows within 400 vph for flows > 2,700 vph (>85% of cases).

GEH Statistic

4. Individual Flows: GEH < 5 (>85% of cases).

3.3 Total PCU Link Count Validation

3.3.1 Using independent traffic count data (that was not used within the model calibration process) the level of Road Model validation was identified. This section describes the validation of the total modelled flow (in total PCUs) using specific / individual points on the road network and summarises the results using the GEH statistic.

[6]Source: http://www.standardsforhighways.co.uk/dmrb/vol12/section2/12s2p1.pdf - paragraph 4.4.43

3.3.2 Note that observed count data covers the AM and PM Peaks only for the purpose of this version of the report.

3.3.3 The validation is described for certain road types and by geographical area, including:

- Motorways – National;
- Trunk Roads - South East Scotland;
- Trunk Roads – South West Scotland;
- Trunk Roads – North East Scotland; and
- Trunk Roads – North West Scotland.

3.3.4 Appendix H provides validation statistics and further descriptions for each of the locations used within the detailed validation process. Appendix I graphically represents the GEH statistics by geographical area.

3.3.5 Tables 3.1 to 3.10 provide a summary of the Road Model validation by creating an average traffic flow from the available traffic count and modelled flow information. Motorways and Trunk roads are considered in the analysis.

Table 3.1 Traffic Counts Validation Summary – Motorways - AM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
M8	E	10	3,575	3,713	4%
	W	10	3,396	3,381	0%
M80	N	1	2,088	2,067	-1%
	S	1	1,866	1,742	-7%
M73	N	2	4,045	3,303	-18%
	S	2	2,870	2,147	-25%
M77	N	5	2,338	2,596	11%
	S	5	2,095	1,823	-13%
M90	S	2	2,321	3,244	40%
M74	N	2	1,807	1,707	-6%
	S	4	1,528	1,334	-13%
A74 (M)	N	4	1,047	991	-5%
	S	4	851	791	-7%
M9	W	2	1,497	1,255	-16%

3.3.6 Table 3.1 demonstrates that the AM Peak Road Model provides a reasonable match to observed count data along the M8, M80, M74 and A74 (M) routes (overall). However, the model has lower level of traffic levels on the M73, and M9 and higher levels of traffic using the M90.

3.3.7 When comparing the M90 average modelled flow (southbound direction in the AM Peak) with other traffic data, the count recorded does appear relatively low for a busy motorway location. Therefore, the model is most likely demonstrating a reasonable level of flow at this location than the count data used here suggests.

Table 3.2 Traffic Counts Validation – Motorways - PM Peak Hour

3.3.8

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
M8	E	10	3,166	3,478	10%
	W	10	3,562	3,843	8%
M80	N	1	1,974	1,997	1%
	S	1	2,255	2,180	-3%
M73	N	2	3,635	3,470	-5%
	S	2	3,086	2,736	-11%
M77	N	5	1,755	2,004	14%
	S	5	3,177	2,861	-10%
M90	S	2	2,679	2,647	-1%
M74	N	2	1,945	1,591	-18%
	S	3	1,632	1,698	4%
A74 (M)	N	4	1,177	1,214	3%
	S	4	1,212	1,286	6%
M9	W	2	2,567	2,062	-20%

3.3.9 Table 3.2 demonstrates that the PM Peak Road Model provides a reasonable match to observed count data (overall) along the M8, M80, M73 and A74 (M) routes. The model tends to produce a more varied comparison for the M77, M74 and M9.

3.3.10 Overall, almost all Motorway validation locations record a % difference of less than +/- 20% in both the AM and PM Peak hours, with the majority of locations demonstrating a % difference of less than 10%.

3.3.11 Tables 3.3 and 3.4 overleaf suggest that the Model tends to overestimate traffic using the Edinburgh Bypass in both the AM and PM Peak hours (particularly in the westbound direction). This specific variation should be borne in mind when applying the Road Model.

Table 3.3 Traffic Counts Validation – South East Trunk Roads - AM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
Bypass (A720)	E	8	2,319	2,728	18%
	W	5	2,372	3,138	32%
A702	N	4	206	286	38%
	S	3	142	175	23%
A68	N	5	303	256	-15%
	S	5	235	165	-30%
A6091	E	1	752	522	-31%
	W	1	496	483	-3%
A7	N	2	458	512	12%
	S	2	322	362	13%
A1	E	8	NA	997	NA
	W	5	NA	1,412	NA

Table 3.4 Traffic Counts Validation – South East Trunk Roads - PM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
Bypass (A720)	E	8	2,837	3,241	14%
	W	5	2,069	2,947	42%
A702	N	4	181	192	6%
	S	3	269	311	16%
A68	N	5	255	248	-3%
	S	5	352	300	-15%
A6091	E	1	538	612	14%
	W	1	619	680	10%
A7	N	2	319	683	114%
	S	2	447	755	69%
A1	E	8	NA	1,571	NA
	W	5	NA	1,136	NA

3.3.12 The analysis also suggests some routing variations between the A702, A68, A6091 and the A7, as traffic travels through / to the borders and surrounding areas. With the exception of the A7 in the PM Peak, these fluctuations are relatively minor and within the levels expected for such a large model. The traffic counts on the A7 are located to the North of Hawick, and the zone used to represent this town also covers a wide surrounding area. The traffic associated with this zone is loaded at one point, close to the count location and therefore the model will tend to over estimate traffic flows at this specific location.

Table 3.5 Traffic Counts Validation – South West Trunk Roads - AM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
A75	E	10	318	334	5%
	W	10	323	304	-6%
A77	N	5	373	515	38%
	S	3	178	381	114%
A76	N	8	374	480	29%
	S	8	371	378	2%
A8	E	3	3,111	2,669	-14%
	W	3	2,911	2,668	-8%
A726	N	1	1,538	663	-57%
	S	1	1,412	1,089	-23%

Table 3.6 Traffic Counts Validation – South West Trunk Roads - PM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
A75	E	10	333	342	3%
	W	10	372	393	6%
A77	N	5	375	512	37%
	S	3	190	435	129%
A76	N	8	354	401	13%
	S	8	610	606	-1%
A8	E	3	3,062	2,721	-11%
	W	3	3,166	2,695	-15%
A726	N	1	1,654	932	-44%
	S	1	1,578	1,247	-21%

3.3.13 Tables 3.5 and 3.6 indicate that the model provides a reasonable reflection of observed traffic data along the A75, A76 and A8 during both the AM and PM Peak hours.

3.3.14 The analysis also suggests that the Road Model is overestimating the level of traffic at this location on the A77 (note that the absolute level of traffic is relatively low), but underestimating traffic levels using the A726 (although only one traffic count is available for comparison along this route).

Table 3.7 Traffic Counts Validation – North East Trunk Roads - AM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
A90	E	5	1,023	1,116	9%
	W	8	1,114	1,263	13%
A96	E	7	632	600	-5%
	W	8	609	589	-3%
A95	E	3	113	82	-28%
	W	3	143	101	-29%
A985	E	2	624	630	1%
	W	1	535	766	43%

Table 3.8 Traffic Counts Validation – North East Trunk Roads - PM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
A90	E	5	1,206	1,321	10%
	W	8	1,108	1,344	21%
A96	E	7	643	599	-7%
	W	8	752	655	-13%
A95	E	3	170	137	-19%
	W	3	154	148	-4%
A985	E	2	564	599	6%
	W	1	498	609	22%

3.3.15 Tables 3.7 and 3.8 illustrates that the Road model provides a reasonable reflection of North East traffic levels using Trunk Roads. There is a slight over estimation of traffic using the A95 and A985 (westbound) but these routes are used by a relatively low level of traffic.

3.3.16 Tables 3.9 and 3.10 illustrate that the Road Model offers a more varied validation comparison of observed traffic counts located on Trunk Roads in the North West of Scotland. Although the validation suggests some fairly substantial % differences in some areas, most of these routes are only used by a relatively low level of traffic. On more heavily used sections, (the A9 for example) the model provides a more reasonable validation with observed traffic levels.

3.3.17 Generally, the model tends to under estimate the level of traffic using the majority of these lower-use routes. Given the relative coarseness of the model zone system this trend would be expected as the traffic not included in the model would constitute a higher proportion of the total traffic in these areas.

Table 3.9 Traffic Counts Validation – North West Trunk Roads - AM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
A835	E	4	261	310	19%
	W	4	315	235	-25%
A87	E	3	51	71	39%
	W	3	60	39	-35%
A85	E	9	154	140	-9%
	W	9	176	139	-21%
A83	E	6	153	100	-35%
	W	6	131	103	-22%
A84	N	2	156	97	-38%
	S	2	179	198	11%
A82	N	8	231	201	-13%
	S	8	216	209	-3%
A9 Caithness to Inverness	N	6	262	290	11%
	S	6	307	329	7%
A9 Inverness to Perth	N	4	387	468	21%
	S	5	330	466	42%
A9 Perth to Stirling	N	3	1,219	1,085	-11%
	S	3	979	857	-12%

Table 3.10 Traffic Counts Validation – North West Trunk Roads - PM Peak Hour

Road	Direction	No. counts	Observed Count	Modelled PCU Flow	% Change
A835	E	4	362	186	-49%
	W	4	325	309	-5%
A87	E	3	98	51	-48%
	W	3	89	60	-32%
A85	E	9	183	142	-22%
	W	9	199	153	-23%
A83	E	6	149	140	-6%
	W	6	194	148	-24%
A84	N	2	225	206	-9%
	S	2	193	164	-15%
A82	N	8	278	205	-26%
	S	8	288	242	-16%
A9 Caithness to Inverness	N	6	370	355	-4%
	S	6	306	289	-6%
A9 Inverness to Perth	N	4	364	502	38%
	S	5	582	524	-10%
A9 Perth to Stirling	N	3	1,153	957	-17%
	S	3	1,096	1,068	-3%

3.4 Heavy Goods Vehicle Flow Validation

3.4.1 To determine the level of HGV validation at key strategic network locations, modelled HGV flows were compared against observed SRTDb HGV data on individual Motorway and A-Roads links.

3.4.2 Appendix J provides detailed HGV validation statistics (based on vehicles rather than PCUs). A summary of the HGV validation statistics is described in Table 3.11.

Table 3.11 Summary of HGV Link Flow Validation

GEH Ranges	AM Peak No. of Links	% of TOTAL	Inter Peak No. of Links	% of TOTAL	PM Peak No. of Links	% of TOTAL
0-5	28	46%	25	41%	35	57%
5-7	11	18%	12	20%	9	15%
7-10	6	10%	11	18%	11	18%
10-15	12	20%	11	18%	4	7%
>15	4	7%	2	3%	2	3%
TOTAL	**61**	**100%**	**61**	**100%**	**61**	**100%**

3.4.3 Table 3.11 indicates that around 40%-50% of HGV validation links display a GEH of less than 5, with well over 50% of links recording a GEH of less than 7 in all time periods.

3.4.4 The previously noted DMRB criteria is not relevant here for the validation of HGVS or other subsets of the total modelled traffic. However, for the purpose of presenting the validation against 'a' criteria, DMRB has been used (ie modelled values to be within 100 vph on links with observed flows <700vph), then 82% of links in the AM Peak, 82% in the Inter Peak and 90% in the PM Peak.

3.4.5 The most notable exceptions include the M8 eastbound on screenline 23 in the AM peak hour (overestimation of HGV traffic flow), M8 westbound on screenline 2301 in the Inter Peak hour (underestimation of the HGV traffic flow) and A8 westbound on screenline 801 (under estimation of HGV traffic flow) in the PM Peak hour. Full details of this HGV 'validation' are provided in Appendix J.

3.5 Traffic Flow on Scotland's Key Road Bridges

3.5.1 This section outlines a comparison between observed total PCU traffic counts and modelled total PCU traffic flow crossing the following key road bridges:

- A9 Kessock Bridge;
- A92 Tay Bridge;
- M90 Friarton Bridge;
- A876 Kincardine Bridge;
- A90 Forth Road Bridge;
- M8 Kingston Bridge; and
- A898 Erskine Bridge.

Table 3.12 AM Peak Hour Key Road Bridge Flow Comparison

Road Bridge	Direction	Total PCU Count	Total PCU Modelled Flow	% Difference	GEH
A9 Kessock Bridge	NB	879	855	-3%	**0.82**
	SB	1,534	1,587	3%	**1.34**
A92 Tay Bridge	NB	1,991	2,220	12%	**4.98**
	SB	730	885	21%	**5.46**
M90 Friarton Bridge	NB	1,697	1,397	-18%	**7.62**
	SB	1,344	1,164	-13%	**5.09**
A876 Kincardine Bridge	NB	1,258	1,337	6%	**2.18**
	SB	1,345	1,453	8%	**2.89**
A90 Forth Road Bridge	NB	2,886	2,951	2%	**1.20**
	SB	3,450	3,478	1%	**0.48**
M8 Kingston Bridge	NB	8,057	8,005	-1%	**0.58**
	SB	6,247	5,641	-10%	**7.86**
A898 Erskine Bridge	NB	1,551	1,572	1%	**0.54**
	SB	1,664	1,662	0%	**0.06**

3.5.2 Table 3.12 illustrates a very good match between modelled total PCU traffic flow and observed traffic counts on the majority of Scotland's key road bridges for the AM Peak hour.

3.5.3 The Kessock, Forth Road and Erskine bridges exhibit the best comparison with observed count data; the Kincardine Bridge also compares favourably with the observed count data.

3.5.4 There appears to be a minor routing issue regarding the Tay and Friarton bridges; an over-estimation and under-estimation in total PCU traffic flow respectively (the under and over-estimations being of similar magnitude). This is likely to be due to the introduction of the HGV speed cap and HGV generalised cost parameters in the final base year assignment process.

3.5.5 As noted in chapter two, the matrix estimation procedure made use of the Car Non-Work Commuter generalised cost parameters in the AM/PM Peak hours – these being appropriate given the nature of the travel purpose in these time periods. As a result, the HGV speed cap and generalised costs parameters did not come in to affect until the total PCU matrix was split in to the five user classes, ie for the final base year assignment.

3.5.6 Furthermore, HGV route choice is influenced more by route distance (than link speeds / time), and hence the distance generalised cost coefficient in the generalised cost formula from which routes (or paths) are built. Therefore, a higher proportion of modelled HGV traffic travelling between Dundee and the south would opt to travel via the A92 through Fife and across the Tay Bridge, as this route provides the shortest distance.

3.5.7 Despite this characteristic, the GEH statistics are acceptable for the Tay and Friarton Bridges.

3.5.8 There is an under-representation of traffic southbound on the Kingston bridge in the AM Peak hour. This could be directed at a local traffic issue given the lack of network and zonal detail for Glasgow City Centre.

3.5.9 These two issues should be borne in mind when appraising road schemes directly affected or influenced by these traffic corridors.

Table 3.13 Average Inter Peak Hour Key Road Bridge Flow Comparison

Road Bridge	Direction	Total PCU Count	Total PCU Modelled Flow	% Difference	GEH
A9 Kessock Bridge	NB	918	868	-5%	**1.69**
	SB	1,046	1,138	9%	**2.78**
A92 Tay Bridge	NB	738	807	9%	**2.50**
	SB	734	908	24%	**6.07**
M90 Friarton Bridge	NB	1,113	972	-13%	**4.37**
	SB	1,315	1,047	-20%	**7.79**
A876 Kincardine Bridge	NB	937	961	3%	**0.79**
	SB	862	939	9%	**2.56**
A90 Forth Road Bridge	NB	1,931	2,069	7%	**3.09**
	SB	2,099	2,070	-1%	**0.64**
M8 Kingston Bridge	NB	5,759	5,502	-4%	**3.42**
	SB	5,508	5,448	-1%	**0.82**
A898 Erskine Bridge	NB	1,074	1,105	3%	**0.93**
	SB	1,190	1,189	0%	**0.02**

3.5.10 Table 3.13 illustrates a very good match between modelled total PCU traffic flow and observed traffic counts on the majority of Scotland's key road bridges for the average Inter Peak hour.

3.5.11 As highlighted in the AM Peak hour analysis, there appears to be a minor routing issue regarding the Tay and Friarton bridges. Absolute differences are in the range of 100-300 total PCUs, and, as before, GEH statistics are still within acceptable limits.

Table 3.14 PM Peak Hour Key Road Bridge Flow Comparison

Road Bridge	Direction	Total PCU Count	Total PCU Modelled Flow	% Difference	GEH
A9 Kessock Bridge	NB	1,488	1,448	-3%	**1.04**
	SB	1,245	1,300	4%	**1.54**
A92 Tay Bridge	NB	925	1,058	14%	**4.23**
	SB	1,467	1,603	9%	**3.46**
M90 Friarton Bridge	NB	1,453	1,261	-13%	**5.22**
	SB	1,732	1,563	-10%	**4.16**
A876 Kincardine Bridge	NB	1,365	1,467	7%	**2.71**
	SB	1,167	1,192	2%	**0.72**
A90 Forth Road Bridge	NB	3,622	3,665	1%	**0.71**
	SB	2,867	2,837	0%	**0.55**
M8 Kingston Bridge	NB	5,307	5,541	4%	**3.18**
	SB	7,859	8,360	6%	**5.56**
A898 Erskine Bridge	NB	1,749	1,874	7%	**2.94**
	SB	1,740	1,809	4%	**1.63**

3.5.12 Table 3.14 illustrates a very good match between modelled total PCU traffic flow and observed traffic counts on the majority of Scotland's key road bridges for the PM Peak hour.

3.5.13 The analysis highlights a slight over-representation in total PCU traffic flow over the majority of bridges with the one exception being the level of traffic flow using the Friarton Bridge. Here we see an under-representation of modelled traffic and as highlighted in the AM and Inter-Peak hours analysis, there appears to be a slight routing issue in this area.

3.5.14 The over/under-representation on the Tay and Friarton bridges is in the magnitude of 100-200 total PCUs. Despite this trend, the model records an acceptable GEH statistic of around 5 for both routes.

Traffic Flow on Scotland's Key Road Bridges Conclusions

3.5.15 The analysis of traffic flows on Scotland's key road bridges highlight a very good comparison with observed data across all three time periods.

3.5.16 There are a couple issues which have been highlighted, ie HGV routing on the Tay and Friarton bridges across all three time periods along with an under-estimation (around 10%) of AM Peak hour Kingston Bridge southbound total PCU traffic (which probably reflects a local traffic issue given the lack of network and zonal detail within Glasgow City centre).

3.5.17 Overall, the vast majority of GEH statistics are <5 which demonstrates a good level of calibration and validation on Scotland's key road bridges.

3.6 DMRB Journey Time Validation Criteria

3.6.1 To determine the overall robustness of modelled journey times, DMRB criteria and guidelines have been used as a benchmark.

3.6.2 DMRB[7] journey time validation criterion and guideline states modelled journey times to be within 15% (or one minute, if higher) for greater than 85% of routes.

3.7 Journey Time Validation

3.7.1 As part of the validation process, observed and modelled journey times have been compared against twenty-nine routes using ITIS journey time data and journey time data collected for the Strategic Transport Projects Review (STPR) Highland Model.

3.7.2 Journey time data used in the TMfS:05 Re-base model has been analysed but isn't considered in the main validation due to the historic nature of the observed journey times (some dating as far back as 2002). This analysis is included in Appendix M to provide an indicative view of observed and modelled journey times in the more urban areas (ITIS and STPR Highland model routes tend to cover inter-urban and rural routes which are more reflective of the network detail included within the National Road model).

3.7.3 The two sets of data (ITIS and STPR Highland Model routes) provide a comprehensive coverage of Scotland's strategic trunk road network for journey time validation purposes.

ITIS Speed Data

3.7.4 ITIS has developed and operates a system to collect and analyse traffic information using Floating Vehicle Data (FVD). Using GPS and GSM technology, ITIS collect speed and position information from probe vehicles. The data from the probe vehicles is then aggregated to determine the average speed for a given stretch of road. The entire data set is made up of over 900 million points and is available throughout Great Britain.

3.7.5 Note that we have not been able to obtain estimates of the variability of ITIS observations and therefore cannot estimate 95% confidence intervals (or High/Low ranges) for the ITIS-based speed estimates.

[7] Source: http://www.standardsforhighways.co.uk/dmrb/vol12/section2/12s2p1.pdf - paragraph 4.4.43

3.7.6 However, the ITIS dataset is expected to provide a reasonable estimate of mean journey times against which to validate the model for routes where no directly-observed journey time surveys have been carried out.

3.7.7 Appendix K illustrates the routes for which ITIS data was extracted and also provides a detailed description of each route. Tables 3.15 to 3.17 provide a comparison of the Road Model and ITIS journey times.

STPR Highland Model Journey Time Routes

3.7.8 As part of the STPR Highland Model, a series of journey times for routes throughout the Highland region were collected in May 2007 and these have been used to supplement the ITIS journey time routes.

3.7.9 Appendix L depicts the STPR Highland Model journey time routes. Tables 3.18 to 3.20 highlight a comparison between the Road Model journey times and STPR Highland Model journey time routes.

3.7.10 Table 3.15 overleaf shows a generally good representation of modelled road journey times compared to the ITIS journey time data, with the overwhelming majority falling within DMRB guidelines.

3.7.11 The largest difference (increase of around 10 minutes each) in journey time can be seen for the Dunfermline to Edinburgh and Edinburgh Bypass (westbound) routes.

3.7.12 The observed journey time for the Dunfermline to Edinburgh route appears unrealistic, ie illustrating a slower journey time (around 11 minutes) travelling northbound than southbound (around 14 minutes) in the AM Peak hour. The model suggests the reverse of this trend and with a journey time of around 20 minutes on the Dunfermline to Edinburgh route, this appears to be a more appropriate reflection for this route.

3.7.13 The modelled Edinburgh Bypass westbound route illustrates an increase of 9 minutes when compared to the observed journey time data. The underlying congested network speeds highlight an intuitive trend of congestion build-up from Sheriffhall roundabout to the M8 Junction 1 (resulting from traffic feeding onto the Edinburgh Bypass at Sheriffhall, Straiton and Lothianburn from strategic routes north and south of the Bypass). This increase in journey time equates to an overall modelled journey time of around 30 minutes, which is deemed realistic and appropriate for this route.

3.7.14 The largest difference (decreases) in journey time can be seen for the Fort William to Ullapool and Erskine to Oban routes; around 18 to 21 minutes and 11 to 16 minutes both directions respectively. Over such distances, 179km and 136km respectively, this is an acceptable difference in journey time and, as such, the routes fall within DMRB criteria. All other routes show small differences in modelled and observed journey times which provides confidence in the overall robustness of the flow delay relationships used in the National Road Model (as described in TMfS:07 National Road Model Development report).

Table 3.15 AM Peak Hour ITIS Journey Time Validation

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)	Within DMRB Criteria?
1	Edinburgh to Dunfermline	N	14	14.7	14.2	-0.5	Yes
		S		11.1	21.0	9.9	No
2	Dunfermline to Perth	N	44	26.5	25.4	-1.1	Yes
		S		25.6	25.3	-0.3	Yes
3	Dundee to Aberdeen	N	95	65.5	62.2	-3.2	Yes
		S		63.7	59.0	-4.7	Yes
4	Perth to Inverness	N	171	121.2	118.4	-2.8	Yes
		S		115.5	116.5	0.9	Yes
5	Ayr to Kilmarnock	N	12	8.3	7.8	-0.5	Yes
		S		9.3	7.2	-2.0	No
6	Kilmarnock to Glasgow	N	25	17.5	15.0	-2.5	Yes
		S		17.9	14.4	-3.5	No
7	Livingston to Edinburgh	E	14	10.9	14.2	3.3	No
		W		13.5	10.8	-2.7	No
8	Greenock to Glasgow (Eastend)	E	41	34.3	38.5	4.2	Yes
		W		36.7	38.9	2.2	Yes
9	Glasgow to Stirling	N	28	23.2	24.6	1.4	Yes
		S		23.4	28.4	5.0	No
10	Dumfries to Hamilton	N	98	65.8	59.8	-6.0	Yes
		S		62.6	60.0	-2.6	Yes
11	Aberdeen to Inverness	N	158	140.2	131.8	-8.4	Yes
		S		137.2	134.4	-2.8	Yes
12	Glasgow to Edinburgh	E	66	52.8	57.4	4.6	Yes
		W		53.8	53.9	0.0	Yes
13	Ayton to Edinburgh	N	62	41.6	38.7	-2.8	Yes
		S		40.6	38.4	-2.2	Yes
14	Stirling to Perth	N	49	30.9	31.6	0.6	Yes
		S		32.1	30.7	-1.4	Yes
15	Dunfermline to Dundee	N	67	42.0	41.1	-1.0	Yes
		S		42.2	40.7	-1.6	Yes
16	Dumfries to Irvine	N	98	87.5	79.3	-8.2	Yes
		S		86.8	77.5	-9.3	Yes
17	Erskine to Fort William	N	149	119.2	112.5	-6.7	Yes
		S		123.9	113.9	-10.0	Yes
18	Fort William to Ullapool	N	179	155.5	134.9	-20.6	Yes
		S		152.6	135.1	-17.5	Yes
19	Inverness to Wick	N	165	128.7	130.0	1.3	Yes
		S		132.1	132.4	0.3	Yes
20	Oban to Fort William	N	70	60.7	54.9	-5.9	Yes
		S		61.2	55.2	-6.0	Yes
21	Erskine to Oban	N	136	112.8	101.6	-11.2	Yes
		S		119.3	103.6	-15.7	Yes
22	Edinburgh to Dundee	N	120	104.0	102.2	-1.7	Yes
		S		104.5	103.3	-1.2	Yes
23	Edinburgh Bypass	E	21	18.6	19.3	0.7	Yes
		W		19.1	28.2	9.1	No
24	Jedburgh to Edinburgh	N	70	61.8	55.9	-5.9	Yes
		S		64.0	53.7	-10.3	No
25	Stranraer to Ayr	N	79	71.7	62.6	-9.1	Yes
		S		72.5	61.5	-10.9	No
26	Stranraer to Dumfries	E	112	90.7	81.4	-9.3	Yes
		W		84.7	81.6	-3.1	Yes
27	Dumfries to Gretna	E	36	27.4	26.1	-1.3	Yes
		W		27.9	25.9	-2.1	Yes
28	Abington to Edinburgh	N	56	48.9	43.6	-5.2	Yes
		S		48.0	42.4	-5.7	Yes
29	Kinveachy to Keith	N	72	60.0	55.9	-4.1	Yes
		S		58.5	55.8	-2.8	Yes

Table 3.16 Average Inter Peak ITIS Journey Time Validation

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)	Within DMRB Criteria?
1	Edinburgh to Dunfermline	N	14	11.0	11.3	0.3	Yes
		S		11.0	11.0	0.0	Yes
2	Dunfermline to Perth	N	44	26.5	25.2	-1.3	Yes
		S		25.5	24.9	-0.6	Yes
3	Dundee to Aberdeen	N	95	64.6	57.5	-7.1	Yes
		S		63.0	59.3	-3.7	Yes
4	Perth to Inverness	N	171	118.2	118.3	0.1	Yes
		S		117.9	117.1	-0.8	Yes
5	Ayr to Kilmarnock	N	12	8.2	7.6	-0.6	Yes
		S		9.3	7.0	-2.3	No
6	Kilmarnock to Glasgow	N	25	17.4	14.2	-3.2	No
		S		17.1	14.1	-3.0	No
7	Livingston to Edinburgh	E	14	10.6	10.2	-0.5	Yes
		W		11.5	10.2	-1.3	Yes
8	Greenock to Glasgow (Eastend)	E	41	31.0	34.6	3.7	Yes
		W		30.9	35.5	4.7	No
9	Glasgow to Stirling	N	28	20.0	19.8	-0.1	Yes
		S		20.5	20.5	0.1	Yes
10	Dumfries to Hamilton	N	98	63.6	59.4	-4.2	Yes
		S		63.4	59.6	-3.8	Yes
11	Aberdeen to Inverness	N	158	139.7	126.8	-12.9	Yes
		S		133.4	128.4	-5.0	Yes
12	Glasgow to Edinburgh	E	66	46.2	45.7	-0.5	Yes
		W		45.5	46.0	0.5	Yes
13	Ayton to Edinburgh	N	62	42.1	38.3	-3.9	Yes
		S		40.8	38.3	-2.5	Yes
14	Stirling to Perth	N	49	30.6	30.9	0.3	Yes
		S		30.8	30.5	-0.3	Yes
15	Dunfermline to Dundee	N	67	40.6	39.9	-0.7	Yes
		S		41.3	40.3	-1.0	Yes
16	Dumfries to Irvine	N	98	85.2	78.4	-6.8	Yes
		S		86.8	76.6	-10.2	Yes
17	Erskine to Fort William	N	149	123.4	112.4	-11.0	Yes
		S		123.3	112.6	-10.7	Yes
18	Fort William to Ullapool	N	179	151.0	135.0	-16.0	Yes
		S		151.7	134.8	-16.9	Yes
19	Inverness to Wick	N	165	126.1	129.9	3.8	Yes
		S		127.4	132.0	4.6	Yes
20	Oban to Fort William	N	70	64.0	54.9	-9.1	Yes
		S		64.8	55.2	-9.6	Yes
21	Erskine to Oban	N	136	116.8	100.8	-16.0	Yes
		S		116.2	100.9	-15.3	Yes
22	Edinburgh to Dundee	N	120	99.5	92.1	-7.4	Yes
		S		97.8	91.5	-6.3	Yes
23	Edinburgh Bypass	E	21	16.8	15.0	-1.8	Yes
		W		15.8	14.6	-1.2	Yes
24	Jedburgh to Edinburgh	N	70	63.4	54.4	-9.0	Yes
		S		63.4	54.2	-9.2	Yes
25	Stranraer to Ayr	N	79	72.9	61.3	-11.6	No
		S		72.9	61.2	-11.7	No
26	Stranraer to Dumfries	E	112	83.4	81.5	-1.9	Yes
		W		83.6	81.4	-2.2	Yes
27	Dumfries to Gretna	E	36	27.2	25.8	-1.4	Yes
		W		27.4	26.1	-1.3	Yes
28	Abington to Edinburgh	N	56	48.8	42.2	-6.6	Yes
		S		48.1	42.3	-5.8	Yes
29	Kinveachy to Keith	N	72	59.6	55.8	-3.8	Yes
		S		59.5	55.8	-3.7	Yes

3.7.15 Table 3.16 demonstrates that there is a good representation of journey times in the modelled Inter Peak period, with only a handful of routes failing to meet the DMRB criteria (within 15% or 1 minute). These outliers represent fairly short distance routes and, as such, modelled times differ by only two to three minutes. The only exception, relates to the Stranraer to Ayr route, where the model shows a decrease of around 12 minutes for both directions over this 79km route.

3.7.16 Generally, the model tends to illustrate a slight under estimation of journey times within the Inter Peak period.

Table 3.17 PM Peak Hour ITIS Journey Time Validation

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)	Within DMRB Criteria?
1	Edinburgh to Dunfermline	N	14	11.9	26.4	14.5	No
		S		12.5	13.6	1.0	Yes
2	Dunfermline to Perth	N	44	26.5	26.0	-0.5	Yes
		S		25.0	25.2	0.1	Yes
3	Dundee to Aberdeen	N	95	62.8	57.9	-4.9	Yes
		S		61.9	62.8	0.9	Yes
4	Perth to Inverness	N	171	114.6	119.6	5.0	Yes
		S		115.7	117.9	2.3	Yes
5	Ayr to Kilmarnock	N	12	8.2	8.0	-0.2	Yes
		S		9.3	7.3	-2.0	No
6	Kilmarnock to Glasgow	N	25	17.8	14.6	-3.3	No
		S		17.4	15.1	-2.3	Yes
7	Livingston to Edinburgh	E	14	12.8	11.7	-1.1	Yes
		W		13.7	12.8	-0.9	Yes
8	Greenock to Glasgow (Eastend)	E	41	37.9	37.6	-0.4	Yes
		W		37.0	41.3	4.3	Yes
9	Glasgow to Stirling	N	28	22.1	27.3	5.2	No
		S		22.1	25.4	3.3	Yes
10	Dumfries to Hamilton	N	98	63.2	59.7	-3.5	Yes
		S		62.7	60.0	-2.7	Yes
11	Aberdeen to Inverness	N	158	140.0	133.3	-6.7	Yes
		S		133.3	133.8	0.5	Yes
12	Glasgow to Edinburgh	E	66	53.9	55.1	1.2	Yes
		W		55.6	55.8	0.3	Yes
13	Ayton to Edinburgh	N	62	40.9	38.6	-2.3	Yes
		S		39.8	39.0	-0.8	Yes
14	Stirling to Perth	N	49	30.6	31.6	1.0	Yes
		S		30.8	31.1	0.2	Yes
15	Dunfermline to Dundee	N	67	39.9	40.6	0.7	Yes
		S		40.6	41.9	1.3	Yes
16	Dumfries to Irvine	N	98	81.8	77.8	-4.0	Yes
		S		86.7	78.1	-8.7	Yes
17	Erskine to Fort William	N	149	120.2	114.7	-5.5	Yes
		S		120.6	113.8	-6.8	Yes
18	Fort William to Ullapool	N	179	152.1	135.2	-16.9	Yes
		S		152.4	135.3	-17.1	Yes
19	Inverness to Wick	N	165	126.1	133.0	7.0	Yes
		S		127.6	131.1	3.5	Yes
20	Oban to Fort William	N	70	63.9	55.0	-8.9	Yes
		S		65.2	55.2	-10.0	No
21	Erskine to Oban	N	136	113.9	105.2	-8.8	Yes
		S		114.3	103.6	-10.7	Yes
22	Edinburgh to Dundee	N	120	103.9	104.0	0.1	Yes
		S		100.1	101.3	1.3	Yes
23	Edinburgh Bypass	E	21	22.2	35.2	13.1	No
		W		16.3	20.3	4.1	No
24	Jedburgh to Edinburgh	N	70	61.1	54.9	-6.2	Yes
		S		64.0	56.2	-7.7	Yes
25	Stranraer to Ayr	N	79	71.8	61.8	-10.0	Yes
		S		73.8	62.6	-11.2	No
26	Stranraer to Dumfries	E	112	83.1	82.2	-0.9	Yes
		W		85.1	82.4	-2.6	Yes
27	Dumfries to Gretna	E	36	26.4	26.1	-0.3	Yes
		W		26.5	26.2	-0.4	Yes
28	Abington to Edinburgh	N	56	47.7	42.5	-5.2	Yes
		S		48.2	43.5	-4.7	Yes
29	Kinveachy to Keith	N	72	57.7	56.0	-1.7	Yes
		S		58.2	56.0	-2.2	Yes

3.7.17 Table 3.17 illustrates PM Peak hour modelled journey times against the ITIS data. Once again, the model exhibits a good representation of journey times across Scotland's strategic road network. The majority of modelled journey times fall within the DMRB 15% criteria.

3.7.18 Table 3.18 presents the AM Peak hour journey time results for routes to the north and west of the central belt, Tayside and Fife. This analysis is based on the STPR Highland Model journey time data.

3.7.19 Note that where the table does not contain any values, no observed data was available for comparison.

Table 3.18 AM Peak Hour Journey Time Validation – Highland Routes

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)	Within DMRB Criteria?
1	Inverness To Elgin	EB	58	48.0	49.1	1.1	Yes
		WB	58	46.2	49.4	3.3	Yes
2	Aberdeen to Elgin	WB	99	91.7	79.5	-12.2	Yes
		EB	-	-	-	-	-
3	Aviemore to Inverness	NB	44	31.6	28.9	-2.7	Yes
		SB	44	28.9	27.6	-1.2	Yes
4	Inverness to Ullapool	NB	90	64.9	64.4	-0.6	Yes
		SB	90	73.9	65.5	-8.4	Yes
5	Inverness to Dornoch	NB	64	46.9	46.5	-0.4	Yes
		SB	64	59.2	48.0	-11.2	No
6	Helmsdale to Dornoch	SB	45	32.6	35.3	2.6	Yes
		NB	-	-	-	-	-
7	Helmsdale to Thurso	NB	66	49.0	50.5	1.5	Yes
		SB	67	53.2	52.0	-1.2	Yes
8	Latheron to Thurso	NB	37	44.5	26.2	-18.3	No
		SB	37	44.8	26.2	-18.6	No
9	Invergarry to Kyle of Lochalsh	WB	83	62.3	58.4	-3.8	Yes
		EB	83	64.5	58.4	-6.1	Yes
10	Fort William to Inverness	NB	102	88.6	74.1	-14.5	No
		SB	-	-	-	-	-
11	Crianlarich to Oban	WB	67	48.1	50.9	2.9	Yes
		EB	67	46.4	51.1	4.8	Yes
12	Crianlarich to Fort William	NB	85	68.1	65.3	-2.7	Yes
		SB	85	64.5	65.3	0.8	Yes
13	Fort William to Mallaig	WB	66	52.9	49.8	-3.1	Yes
		EB	66	55.4	49.8	-5.6	Yes
14	Dunkeld to Aviemore	NB	112	69.2	75.8	6.6	Yes
		SB	-	-	-	-	-
15	Tarbet to Campbeltown	SB	159	126.2	115.4	-10.8	Yes
		NB	159	128.6	115.5	-13.1	Yes
16	Aviemore to Keith	EB	75	66.4	57.6	-8.8	Yes
		WB	75	63.2	57.5	-5.7	Yes
17	Perth to Dunkeld	NB	17	10.9	11.8	0.9	Yes
		SB	17	11.2	12.0	0.8	Yes
18	Alexandra to Crianlarich	NB	-	-	-	-	-
		SB	-	-	-	-	-
19	Invermoriston to A887-A87 junction	WB	24	16.8	16.3	-0.4	Yes
		EB	24	17.6	16.3	-1.2	Yes
20	Oban to Ballachulish	NB	44	32.9	31.5	-1.4	Yes
		SB	44	35.9	31.7	-4.2	Yes

3.7.20 In general the main strategic routes of the A96, between Inverness/Elgin and Aberdeen/Elgin demonstrate that the model performs well in these areas. DMRB criteria are also meet along the A9 between Inverness and Aviemore. Routes to the north of Inverness, to Ullapool and Dornoch also satisfy DMRB criteria.

3.7.21 Out of the 34 observed journey time routes, 30 routes meet DMRB criteria, demonstrating robust model performance.

Table 3.19 Average Inter Peak Hour Journey Time Validation – Highland Routes

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)	Within DMRB Criteria?
1	Inverness To Elgin	EB	58	47.6	48.1	0.5	Yes
		WB	58	49.5	47.5	-1.9	Yes
2	Aberdeen to Elgin	EB	99	80.9	76.6	-4.3	Yes
		WB	99	77.4	77.3	-0.1	Yes
3	Aviemore to Inverness	NB	44	29.0	28.5	-0.5	Yes
		SB	44	28.2	27.6	-0.6	Yes
4	Inverness to Ullapool	NB	90	66.1	64.3	-1.8	Yes
		SB	90	65.4	64.6	-0.8	Yes
5	Inverness to Dornoch	NB	64	47.9	46.1	-1.8	Yes
		SB	64	47.4	47.6	0.2	Yes
6	Helmsdale to Dornoch	NB	45	36.0	35.3	-0.7	Yes
		SB	45	36.4	35.5	-0.9	Yes
7	Helmsdale to Thurso	NB	66	46.0	50.5	4.5	Yes
		SB	67	47.7	52.2	4.5	Yes
8	Latheron to Thurso	NB	37	44.7	26.2	-18.5	No
		SB	37	42.6	26.2	-16.4	No
9	Invergarry to Kyle of Lochalsh	WB	83	63.8	58.4	-5.3	Yes
		EB	83	62.1	58.3	-3.7	Yes
10	Fort William to Inverness	NB	102	94.7	73.8	-20.8	No
		SB	102	96.3	73.8	-22.5	No
11	Crianlarich to Oban	WB	67	48.0	50.9	2.9	Yes
		EB	67	48.4	51.1	2.8	Yes
12	Crianlarich to Fort William	NB	85	77.6	65.4	-12.1	No
		SB	85	73.0	65.3	-7.7	Yes
13	Fort William to Mallaig	WB	66	56.0	49.8	-6.2	Yes
		EB	66	56.3	49.8	-6.5	Yes
14	Dunkeld to Aviemore	NB	112	71.3	76.0	4.7	Yes
		SB	112	75.8	77.2	1.4	Yes
15	Tarbet to Campbeltown	SB	159	131.0	115.4	-15.6	Yes
		NB	159	126.3	115.5	-10.8	Yes
16	Aviemore to Keith	EB	75	62.9	57.6	-5.3	Yes
		WB	75	61.9	57.6	-4.4	Yes
17	Perth to Dunkeld	NB	-	-	-	-	-
		SB	-	-	-	-	-
18	Alexandra to Crianlarich	NB	59	50.9	41.8	-9.0	No
		SB	59	50.9	42.0	-9.0	No
19	Invermoriston to A887-A87 junction	WB	24	17.9	16.3	-1.5	Yes
		EB	24	17.9	16.3	-1.5	Yes
20	Oban to Ballachulish	NB	44	33.5	31.5	-2.0	Yes
		SB	44	35.7	31.7	-4.1	Yes

3.7.22 Table 3.19 demonstrates the level of validation in the Inter Peak period for Highland journey time routes. In general, the vast majority of journey time routes meet the criteria set by the DMRB. However, the model does tend to reflect slightly quicker journey times than that recorded by this observed data set.

3.7.23 Again similar to the AM Peak period, DMRB criteria is met on the heavily trafficked roads of the A9 and A96 around Inverness.

3.7.24 Out of the 38 observed journey time routes, 31 routes meet DMRB criteria, demonstrating an appropriate level of validation within the Inter Peak.

3.7.25 Note that no observed data was available for Route 17 (Perth to Dunkeld).

3.7.26 Table 3.20 illustrates the comparison with observed Highland journey times in the PM Peak hour (Note that not all of these 20 journey time routes were surveyed in the PM peak hour).

3.7.27 Out of the 13 observed journey time routes, 10 routes meet DMRB criteria, demonstrating an appropriate level of validation.

Table 3.20 PM Peak Hour Journey Time Validation – Highland Routes

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)	Within DMRB Criteria?
1	Inverness To Elgin	EB	58	-	-	-	-
		WB	58	-	-	-	-
2	Aberdeen to Elgin	EB	99	-	-	-	-
		WB	99	-	-	-	-
3	Aviemore to Inverness	NB	44	-	-	-	-
		SB	44	-	-	-	-
4	Inverness to Ullapool	NB	90	-	-	-	-
		SB	90	-	-	-	-
5	Inverness to Dornoch	NB	64	51.0	48.7	-2.3	Yes
		SB	64	47.2	46.5	-0.7	Yes
6	Helmsdale to Dornoch	NB	45	-	-	-	-
		SB	45	-	-	-	-
7	Helmsdale to Thurso	NB	66	46.8	50.6	3.8	Yes
		SB	67	-	-	-	-
8	Latheron to Thurso	NB	37	44.5	26.2	-18.3	No
		SB	37	40.0	26.3	-13.7	No
9	Invergarry to Kyle of Lochalsh	WB	83	-	-	-	-
		EB	83	-	-	-	-
10	Fort William to Inverness	NB	102	-	-	-	-
		SB	102	-	-	-	-
11	Crianlarich to Oban	WB	67	45.0	50.9	6.0	Yes
		EB	67	-	-	-	-
12	Crianlarich to Fort William	NB	85	70.9	65.3	-5.6	Yes
		SB	85	-	-	-	-
13	Fort William to Mallaig	WB	66	-	-	-	-
		EB	66	49.3	49.8	0.5	Yes
14	Dunkeld to Aviemore	NB	112	-	-	-	-
		SB	112	70.6	77.5	6.9	Yes
15	Tarbet to Campbeltown	SB	159	132.2	115.7	-16.5	Yes
		NB	159	128.7	115.6	-13.1	Yes
16	Aviemore to Keith	EB	75	-	-	-	-
		WB	75	61.3	57.8	-3.5	Yes
17	Perth to Dunkeld	NB	-	-	-	-	-
		SB	-	-	-	-	-
18	Alexandra to Crianlarich	NB	59	-	-	-	-
		SB	59	-	-	-	-
19	Invermoriston to A887-A87 junction	WB	24	-	-	-	-
		EB	24	-	-	-	-
20	Oban to Ballachulish	NB	44	-	-	-	-
		SB	44	45.2	31.7	-13.5	No

Journey Time Validation – Summary & Conclusions

3.7.28 Tables 3.21 and 3.22 overleaf highlight a summary of the validation of all journey time routes.

3.7.29 Table 3.21 illustrates that across all time periods, over 85% of modelled journey time routes fall within the criteria set by the DMRB. This is considered an acceptable level of validation for the TMfS:07 Road Model.

Table 3.21 Journey Time Validation Summary – Part 1

Time Period	Proportion within 15% (or 1 minute, if higher) of Observed Journey Times
AM	86% of all routes
IP	86% of all routes
PM	85% of all routes

Table 3.22 Journey Time Validation Summary – Part 2

Time Period	Number of journey times quicker than observed – All routes	% of Total	Number of journey times slower than observed - All routes	% of Total
AM	68	74%	24	26%
IP	78	81%	18	19%
PM	45	63%	26	37%

3.7.30 Table 3.22 shows the number of modelled journey times which are either quicker or slower than the observed journey time. Overall, and as discussed above, there is a tendency to under-estimate journey times in all three time periods, but particularly within the Inter Peak.

3.7.31 Despite the tendency to under estimate journey times, the vast majority of modelled journey times fall within DMRB guidelines.

3.7.32 The combination of ITIS and STPR Highland Model journey time survey data provides a comprehensive coverage of Scotland's strategic road network. Therefore, the Road Model's estimates of road travel times across the Scottish strategic road network are considered appropriate.

3.8 RSI Journey Length Analysis

3.8.1 This section outlines a summary of road side interview (RSI) site journey length for Car Non-Work Commuter and Car Non-Work Other user classes which have been analysed at a selection of fourteen RSI sites[8]. This selection gives a good spread of geographical coverage on (or close to) key strategic routes.

3.8.2 Car Non-Work Commuter traffic has been analysed in the AM and PM Peak hours; Car Non-Work Other in the Average Inter Peak hour.

[8] A92 Tay Bridge, A90 South of Aberdeen (Portlethen) and A780 Dumfries RSI sites have been analysed using total vehicle movements

3.8.3 Appendix N provides a detailed summary of the proportion of observed and modelled Car Non-Work Commuter / Other trips in each distance band (up to a maximum distance of 500km at 50km increments). A map illustrating the location of the RSI sites is also contained within Appendix N. Key points from the analysis are outlined below:

- The modelled trip length at the A90 Forth Road Bridge, A899 Livingston, A780 Dumfries and A90 south of Aberdeen at Portlethen show a good match to observed RSI data across all three time periods;
- In the AM Peak hour, observed data suggests all trips (100%) travel within the 0km-50km band for the A907 Clackmannan site; the model suggests 86% within this distance band and the remaining in the 50km-75km band;
- The key bridge RSI sites (Tay, Kessock, Forth and Erskine (on the A82)) show a very good comparison in trip length for all three time periods;
- As expected, for RSI sites close to urban areas (eg A90 south of Aberdeen at Portlethen, Livingston A899), the majority of car non-work commuter trips travel within the 0km-50km distance band; and
- As expected, for RSI sites in more rural areas, car non-work commuter trips show a greater spread across the distance bands.

3.8.4 The journey length comparison at each of the RSI sites exhibits robust car traffic proportions within each of the distance bands with the best matches at the A90 Forth and A92 Tay Road bridges, A899 Livingston and the A90 south of Aberdeen (Portlethen).

3.8.5 In addition, reasonable proportions of car travel within the distance bands are evident for traffic travelling through urban and more rural area RSI sites, ie those travelling through an urban RSI site are more likely to be travelling a shorter commute distance compared to a more rural location.

3.8.6 Overall, this analysis demonstrates the robustness of the Road Model route choice and pattern within the road travel demand matrix (Note that RSI data was not used to develop the majority of the travel demand matrices, with only the development of HGV travel demand made use of RSI data).

3.9 RSI Trip Distribution Analysis

3.9.1 Following on from the RSI journey length analysis, the trip distribution at the same fourteen RSI sites (as described in Appendix N) was analysed using the 16 sector system highlighted in Figure 2.3 (for all three time periods and for the same user classes).

3.9.2 Full details of the results are shown in Appendix O where the red highlight font indicates the largest sector-to-sector movement.

3.9.3 Some key points of interest from the analysis are described below:

- All the largest observed and modelled sector-to-sector movements match across all three time periods with the exceptions of A82 Crianlarich (all time periods), SITM4 A71 (AM Peak hour only) and A82 Erskine (PM Peak hour only);
- There is a reasonable match for all other sector-to-sector movements which make up the remaining distribution proportion (eg out-with the largest sector-to-sector movement, the A90 Forth Road Bridge RSI site in the AM Peak hour sees an observed 16% of Car Non-Work commuter trips from the Lothians to Fife, the model records 17% from the Lothians to Fife, and an observed 1% from Central to Fife compared to a modelled 3%;
- Of the three outliers, it is the neighbouring sectors which make up the largest movements, eg A82 Crianlarich AM Peak hour – the largest **observed** movement using this site is within the Central sector; the largest **modelled** movement using this site is from Strathclyde to Argyll & Bute, hence neighbouring sectors; and
- RSI trip distributions generally fall in line with RSI journey lengths described in the previous section.

3.9.4 As stated in the RSI journey length analysis, no RSI data was used in the development of the prior road travel demand matrices, with the exception of HGV demand. The RSI trip distribution therefore illustrates a robust validation of road travel patterns, route choices and integrity of the Road Model.

3.10 RSI Car In-Work, Car Non-Work Analysis

3.10.1 This section describes the performance of the Road Model's representation of the proportion of Car In-Work and Car Non-Work journey purposes across sixty-nine road side interview (RSI) sites. The journey purpose split was determined from the interview data at sites where trip purpose was recorded.

3.10.2 Appendix P shows the analysis for all time periods and noting that observed data is not available for some of the RSI sites.

3.10.3 The analysis shows a good match with the observed split of In-Work and Non-Work traffic for all sites and for all three time periods. The modelled In-Work and Non-Work percentage splits are a percentage of total car traffic (Car In-Work, Car Non-Work Commuters and Car Non-Work 'Others') passing through the RSI site.

3.10.4 In a similar comparison to the HGV validation, it should be noted that total vehicles are used in calibration and therefore it is appropriate to use data relating to the In-Work and Non-Work split during validation. The resulting analysis is used to be demonstrative of the validation of matrix proportions (into In-Work and Non-Work purposes) and the assignment methodology.

3.11 Demand Matrix Trip Ends & Planning Data Analysis

3.11.1 This section summarises a comparison of the final base year demand matrix trip ends with base year planning data, all of which is detailed in Appendix Q. The main purpose of this analysis is to illustrate the calibration procedures have not altered the final base year matrix trip ends significantly from the planning data (planning data being one of the sources used to build the prior matrices) by introducing a ranking system to the planning data and trip ends.

3.11.2 Population and employment planning data (these being the main drivers of trip productions and attractions) were ranked by local authority along with the base year demand matrix trip ends to determine whether, broadly speaking, the order of magnitude for productions and attractions within each local authority level (excluding England & Wales) at the trip end level are in line with the planning data assumptions.

3.11.3 Some key points of interest from the analysis are as follows:

- In the AM Peak there is generally a close relationship (ie ranking within 1-3 places) between the ranking of production and attraction trip ends and the planning data. The largest decrease ranking difference is for Inverclyde attractions (ranking difference of -7) and the largest increase ranking difference is for Stirling productions (ranking difference +9);
- Overall, in the Inter Peak hour, the same trend is evident as shown for the AM Peak hour analysis. The largest decrease ranking difference is for Inverclyde attractions (ranking difference of -5) and the largest increase ranking difference is for Stirling productions (ranking difference +10); and
- Finally, in the PM Peak hour, a consistent trend as shown for the AM and Inter Peak hours is illustrated. The largest decrease ranking difference is for Inverclyde attractions (ranking difference of -7) and the largest increase ranking difference is for Stirling productions (ranking difference +10).

3.11.4 This analysis suggests the level of trip making within each local authority is generally acceptable, with a couple of outliers as described above. Given the more simplistic nature of this analysis, users should be mindful that the comparison has only considered some of the main drivers of demand. Other planning data assumptions, such as retail floorspace, which influence the level of trip making within a given local authority, have not been included.

3.12 Census Travel-to-Work & Car Non-Work Commuter Traffic Analysis

3.12.1 This section outlines a results summary of a comparison between census travel-to-work data and modelled AM Peak Car Non-Work commuter traffic. Detailed comparisons using the 16 sector system defined in Figure 2.3 can be found in Appendix R.

3.12.2 Census travel-to-work data is a building block in creating the AM Peak hour prior matrices, as described in section three of the National Road Model development report. Therefore, we would expect the final base year AM Peak hour Car Non-Work commuter traffic to be broadly representative of census travel-to-work movements.

3.12.3 For the purpose of this analysis we have assumed a blanket (ie covering the whole modelled area) car occupancy factor of 1.2 to convert the person travel-to-work data into car vehicles.

3.12.4 Some key points of interest from the analysis are as follows:

- The model generally displays a close match for commuter travel distributions (ie within 1% across all 16 sectors);
- 9% total increase in modelled Car Non-Work commuter traffic compared to census travel-to-work;
- The largest positive difference is within Ayrshire and Strathclyde sectors (2,223 and 3,416 trips respectively) which returns an 18% and 12% difference respectively; and
- The largest negative differences are for Dumfries & Galloway to England & Wales and England & Wales to Strathclyde movements (-277 and -197 respectively) which returns a -77% and -79% difference respectively).

3.12.5 Overall, the Car Non-Work commuter and census travel-to-work data comparison highlights a close trip distribution pattern, with some variation in the magnitude of movements between sectors. This variation results in a 9% total increase in modelled Car Non-Work commuter traffic when compared with the census travel-to-work across the whole modelled area.

3.12.6 Generally, the results represent a broad comparison with census travel-to-work data and offer some insight into the robustness of calibration procedures. However, the reader should bear in mind the relative coarseness of this analysis, particularly the car occupancy assumption.

3.13 Road Model Validation Conclusions

3.13.1 The section outlines the conclusions of the Road Model validation.

Link Count Validation

3.13.2 A comparison of individual modelled and observed link counts was undertaken for various Motorway and Trunk Road locations throughout Scotland.

3.13.3 The model records a reasonable level of validation at Motorway locations, particularly the M8, M80, M74 and A74 (M). There are some variations along other routes, but in some cases these are located on routes were less count data is available.

3.13.4 Although the model records a reasonable overall match for Trunk Roads located in the South East of Scotland, the model does tend to over estimate the level of traffic using the Edinburgh bypass. This variation should be borne in mind when applying the model in this area.

3.13.5 The level of validation in the South West of Scotland is considered appropriate, with particularly the A75 and A8 providing a good match to observed data.

3.13.6 The level of validation within the North East and North West of Scotland is also considered appropriate, especially the more heavily used Trunk Roads of the A96, A90 and A9.

Traffic Flows on Scotland's Key Road Bridges

3.13.7 The analysis of traffic flows on Scotland's key road bridges highlights a good comparison with observed data across all three time periods.

3.13.8 There are a few potential routing issues which have been highlighted, including between the Tay and Friarton Bridges (across all three time periods), along with an under-estimation (10%) in AM Peak hour Kingston Bridge southbound total PCU traffic.

3.13.9 Overall, the majority of GEH statistics are <5 which demonstrates a good level of calibration and validation on Scotland's key road bridges.

Journey Times

3.13.10 The Road Model has been shown to produce comparable representation of road-based journey times for the majority of the journey time validation routes (ITIS and STPR Highland Model. Overall, there is a slight tendency to under-estimate journey times. However the majority of modelled journey times continue to fall within DMRB guidelines and are therefore considered appropriate.

RSI Journey Length and Distribution Analysis

3.13.11 The journey length comparison at each of the RSI sites exhibits robust car traffic proportions within each of the distance bands, with the best comparisons located at the A90 Forth and A92 Tay Road bridges, A899 Livingston and the A90 south of Aberdeen (Portlethen).

3.13.12 In addition, sensible proportions of car travel within the distance bands are evident for traffic travelling through urban and more rural RSI sites - where those travelling through an urban RSI site are more likely to be travelling a shorter commuting distance.

3.13.13 Overall, the analysis indicates a good degree of robustness of the Road Model route choice and of the demand matrix travel patterns.

RSI Car In-Work Car Non-Work Analysis

3.13.14 The RSI Car In-Work Non-Work analysis shows a good match with the observed split of In-Work and Non-Work traffic for all sites and for all three time periods.

Demand Matrix Trip Ends & Planning Data Analysis

3.13.15 This analysis suggests the level of trip making within each local authority is reasonable, with only a couple of outliers identified.

Census Travel-to-Work & Car Non-Work Commuter Traffic Analysis

3.13.16 The Car Non-Work commuter and census travel-to-work data comparison highlights a close trip distribution pattern with some variation in the magnitude of movements between sectors. This variation results in a 9% total increase in modelled Car Non-Work commuter traffic when compared with the census travel-to-work across the whole modelled area.

3.13.17 Overall, the validation of the Road Model is considered reasonable and appropriate for a model of this scale and nature.

4 Conclusions & Recommendations

4.1 Conclusions

4.1.1 This report has presented and discussed the calibration and validation results of the TMfS:07 National Road Model.

4.1.2 The calibration topics that have been covered include:

- Matrix estimation procedures;
- Road travel demand matrix analysis;
- Trip Length Distribution Analysis; and
- Strategic Screenline and Individual Link Traffic Flow Analysis.

4.1.3 Validation topics which have been covered include:

- Individual Link Count Validation;
- HGV Flow Analysis;
- Analysis of traffic flow on Scotland's key road bridges;
- Journey Time Validation;
- RSI Journey Length and Distribution Analysis; and
- Car In-Work, Car Non-Work RSI Analysis.

4.1.4 The trip length distribution analysis highlights the matrix estimation procedure has not altered the prior trip matrix trip length distribution significantly.

4.1.5 The Road Model is reasonably calibrated at the aggregate screenline level, and although the model does not meet the (stringent and less appropriate for a model of this nature) guidelines set by the DMRB, the results do suggest that nearly all screenlines lie within or close to the DMRB criteria of a GEH of less than 4 – with the model indicating that at least 85% of screenlines record a GEH of less than 7.

4.1.6 At the more detailed individual calibration level, the model also records a reasonable level of calibration with around 80% of calibration locations across all time periods falling within a GEH of less than 7. Although this statistic does not quite reflect DMRB criteria, with consideration of the scale and nature of TMfS:07, this comparison suggests that the Road Model is close to matching the level of calibration set by the DMRB.

4.1.7 This more detailed analysis has also indicated that it is the main roads within the model that demonstrate the highest level of calibration.

4.1.8 The Road model exhibits a reasonable representation of HGV flows on key motorway and A-Road links, with around 50% of calibration links displaying a GEH of less than 7.

4.1.9 The Road Model exhibits a good representation of traffic flows on Scotland's key road bridges, the vast majority of crossings recording a GEH of less than 5.

4.1.10 The Road Model also performs well on journey time validation, providing robust estimates of journey time for almost all journey time validation routes. The model achieves DMRB criteria for 86% of these routes in the AM and Inter-peak and 85% in the PM peak.

4.1.11 The Car Non-Work commuter and census travel-to-work data comparison highlights a close trip distribution pattern with some variation in the magnitude of movements between sectors. This variation results in a 9% total increase in modelled Car Non-Work commuter traffic when compared with the census travel-to-work across the whole modelled area.

4.1.12 The Road Model exhibits a very good representation of the observed split of car in-work and car non-work traffic at each of the 69 RSI sites throughout Scotland and in all three modelled time periods. This implies that any modelling and appraisal which uses this journey purpose split (eg the use of different values of time within route and mode choice, conventional TUBA-based TEE appraisal, economic activity appraisal, LUTI interactions based on Business Travel costs etc), are also likely to be robust.

4.2 Recommendations

4.2.1 Our view is that the National Road Transport Model has been successfully developed and is fit for its intended purpose which is to provide road transport costs as part of an integral process in the National Land Use and Transport Modelling Framework for the purpose of appraising of major strategic transport schemes and policy decisions.

4.2.2 It should be noted, however, that, due to the size, nature and data used in the model, there is some local variation in the calibration and validation of the model that is discussed within this report.

4.2.3 The model can be used to provide robust estimates of road-based costs for use in the mode and destination sub-models and the over-arching TELMoS land-use model.

4.2.4 The model can also provide a good starting source of transport supply and demand data for more-detailed sub-area/regional models, provided that relevant checks on the model's robustness in the relevant specific areas are carried out.

4.2.5 **All model applications should be preceded by an appropriate review of the robustness of the model validation in the area/corridor of interest.**

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Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
8	A70	EB	EDINBURGH	City of Edinburgh
8	A8	EB	EDINBURGH	City of Edinburgh
8	M8	EB	EDINBURGH	City of Edinburgh
801	A90	NB	EDINBURGH	City of Edinburgh
801	A71	WB	EDINBURGH	City of Edinburgh
801	A70	WB	EDINBURGH	City of Edinburgh
801	A8	WB	EDINBURGH	City of Edinburgh
801	M8	WB	EDINBURGH	City of Edinburgh
9	A702	SB	EDINBURGH	City of Edinburgh
9	Old Dalkeith Road	EB	EDINBURGH	Lothians
9	A701	SB	EDINBURGH	Lothians
9	B702	SB	EDINBURGH	Lothians
9	A7	SB	EDINBURGH	Lothians
9	B6392	SB	EDINBURGH	Lothians
9	A6094	SB	EDINBURGH	Lothians
9	A6124	SB	EDINBURGH	Lothians
9	Lasswade Road	SB	EDINBURGH	City of Edinburgh
901	A702	NB	EDINBURGH	City of Edinburgh
901	A701	NB	EDINBURGH	Lothians
901	Old Dalkeith Road	WB	EDINBURGH	Lothians
901	B702	NB	EDINBURGH	Lothians
901	A7	NB	EDINBURGH	Lothians
901	B6392	NB	EDINBURGH	Lothians
901	A6094	NB	EDINBURGH	Lothians
901	A6124	NB	EDINBURGH	Lothians

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
901	Lasswade Road	NB	EDINBURGH	City of Edinburgh
10	A1	EB	EDINBURGH	Lothians
10	A199	EB	EDINBURGH	Lothians
10	B1361	EB	EDINBURGH	Lothians
10	B1348	EB	EDINBURGH	Lothians
1001	A1	WB	EDINBURGH	Lothians
1001	A199	WB	EDINBURGH	Lothians
1001	B1361	WB	EDINBURGH	Lothians
1001	B1348	WB	EDINBURGH	Lothians
11	A720	EB	EDINBURGH	City of Edinburgh
11	B701	EB	EDINBURGH	City of Edinburgh
1101	A720	WB	EDINBURGH	City of Edinburgh
1101	B701	WB	EDINBURGH	City of Edinburgh
12	A91	NB	EDINBURGH	Central
12	Forth Road Bridge	NB	EDINBURGH	City of Edinburgh
12	A876	NB	EDINBURGH	Central
12	A9	NB	EDINBURGH	Central
12	Cornton Road	NB	EDINBURGH	Central
1201	A91	SB	EDINBURGH	Central
1201	Forth Road Bridge	SB	EDINBURGH	City of Edinburgh
1201	A876	SB	EDINBURGH	Central
1201	A9	SB	EDINBURGH	Central
1201	Cornton Road	SB	EDINBURGH	Central
13	A907	EB	EDINBURGH	Fife
13	A985	EB	EDINBURGH	Fife

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
13	A823	SB	EDINBURGH	Fife
1301	A907	WB	EDINBURGH	Fife
1301	A985	WB	EDINBURGH	Fife
1301	A823	NB	EDINBURGH	Fife
14	B925	EB	EDINBURGH	Fife
14	B9157	EB	EDINBURGH	Fife
14	A921	NB	EDINBURGH	Fife
14	M90	NB	EDINBURGH	Fife
14	A92	NB	EDINBURGH	Fife
14	B996	NB	EDINBURGH	Perthshire & Kinross
14	B981	EB	EDINBURGH	Fife
1401	B925	WB	EDINBURGH	Fife
1401	B9157	WB	EDINBURGH	Fife
1401	A921	SB	EDINBURGH	Fife
1401	M90	SB	EDINBURGH	Fife
1401	A92	SB	EDINBURGH	Fife
1401	B996	SB	EDINBURGH	Perthshire & Kinross
1401	B981	WB	EDINBURGH	Fife
15	A81	NB	GLASGOW	City of Glasgow
15	A803	NB	GLASGOW	City of Glasgow
15	A879	NB	GLASGOW	City of Glasgow
15	Maryhill Road (A81)	NB	GLASGOW	City of Glasgow
1501	A81	SB	GLASGOW	City of Glasgow
1501	A879	SB	GLASGOW	City of Glasgow

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
1501	A803	SB	GLASGOW	City of Glasgow
1501	Maryhill Road (A81)	SB	GLASGOW	City of Glasgow
16	Argyle Street	EB	GLASGOW	City of Glasgow
16	A82	EB	GLASGOW	City of Glasgow
16	A814	EB	GLASGOW	City of Glasgow
1601	Argyle Street	WB	GLASGOW	City of Glasgow
1601	A82	WB	GLASGOW	City of Glasgow
1601	A814	WB	GLASGOW	City of Glasgow
17	Cumbernauld Road	WB	GLASGOW	City of Glasgow
17	M80	WB	GLASGOW	Strathclyde
1701	Cumbernauld Road	EB	GLASGOW	City of Glasgow
1701	M80	EB	GLASGOW	Strathclyde
18	A8	EB	GLASGOW	City of Glasgow
18	A89	EB	GLASGOW	City of Glasgow
18	M8	EB	GLASGOW	City of Glasgow
18	B765	EB	GLASGOW	City of Glasgow
1801	A8	WB	GLASGOW	City of Glasgow
1801	B765	WB	GLASGOW	City of Glasgow
1801	M8	WB	GLASGOW	City of Glasgow
19	A724	EB	GLASGOW	Strathclyde
19	A749	SB	GLASGOW	Strathclyde
19	M74	EB	GLASGOW	City of Glasgow
19	B759	SB	GLASGOW	Strathclyde
1901	A724	WB	GLASGOW	Strathclyde
1901	A749	NB	GLASGOW	Strathclyde

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
1901	M74	WB	GLASGOW	City of Glasgow
1901	B759	NB	GLASGOW	Strathclyde
20	A736	NB	GLASGOW	City of Glasgow
20	Peat Road	NB	GLASGOW	City of Glasgow
20	M77	NB	GLASGOW	City of Glasgow
20	B769	NB	GLASGOW	Strathclyde
20	A77	NB	GLASGOW	Strathclyde
20	B766	NB	GLASGOW	City of Glasgow
20	B767	NB	GLASGOW	Strathclyde
2001	A736	SB	GLASGOW	City of Glasgow
2001	Peat Road	SB	GLASGOW	City of Glasgow
2001	M77	SB	GLASGOW	City of Glasgow
2001	B769	SB	GLASGOW	Strathclyde
2001	A77	SB	GLASGOW	Strathclyde
2001	B766	SB	GLASGOW	City of Glasgow
2001	B767	SB	GLASGOW	Strathclyde
21	A761	EB	GLASGOW	Strathclyde
21	M8	EB	GLASGOW	Strathclyde
2101	A761	WB	GLASGOW	Strathclyde
2101	M8	WB	GLASGOW	Strathclyde
22	A898	NB	GLASGOW	Strathclyde
22	A77	NB	GLASGOW	City of Glasgow
22	A8	NB	GLASGOW	City of Glasgow
22	A8	NB	GLASGOW	City of Glasgow
22	A739	NB	GLASGOW	City of Glasgow

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
22	M8 Kingston Bridge	NB	GLASGOW	City of Glasgow
22	M8 Kingston Bridge	NB	GLASGOW	City of Glasgow
2201	A898	SB	GLASGOW	Central
2201	A8	SB	GLASGOW	City of Glasgow
2201	A739	SB	GLASGOW	City of Glasgow
2201	M8 Kingston Bridge	SB	GLASGOW	City of Glasgow
2201	A77	SB	GLASGOW	City of Glasgow
23	M8	EB	GLASGOW	City of Glasgow
2301	M8	WB	GLASGOW	City of Glasgow
25	A803	EB	CENTRAL & TAYSIDE	Central
25	A80	NB	CENTRAL & TAYSIDE	Strathclyde
25	B816	NB	CENTRAL & TAYSIDE	Strathclyde
2501	A803	WB	CENTRAL & TAYSIDE	Central
2501	A80	SB	CENTRAL & TAYSIDE	Strathclyde
2501	B816	SB	CENTRAL & TAYSIDE	Strathclyde
27	A85	EB	CENTRAL & TAYSIDE	Perthshire & Kinross
27	A9 (North of Perth)	SB	CENTRAL & TAYSIDE	Perthshire & Kinross
27	A9 (South of Perth)	NB	CENTRAL & TAYSIDE	Perthshire & Kinross
2701	A85	WB	CENTRAL & TAYSIDE	Perthshire & Kinross
2701	A9 (North of Perth)	NB	CENTRAL & TAYSIDE	Perthshire & Kinross
2701	A9 (South of Perth)	SB	CENTRAL & TAYSIDE	Perthshire & Kinross

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
28	A92	NB	CENTRAL & TAYSIDE	Fife
28	M90	NB	CENTRAL & TAYSIDE	Perthshire & Kinross
2801	A92	SB	CENTRAL & TAYSIDE	Fife
2801	M90	SB	CENTRAL & TAYSIDE	Perthshire & Kinross
29	A709	EB	SOUTH	Dumfries & Galloway
29	A75	EB	SOUTH	Dumfries & Galloway
29	A75	WB	SOUTH	Dumfries & Galloway
29	A76	NB	SOUTH	Dumfries & Galloway
29	A701	NB	SOUTH	Dumfries & Galloway
2901	A709	WB	SOUTH	Dumfries & Galloway
2901	A75	WB	SOUTH	Dumfries & Galloway
2901	A75	EB	SOUTH	Dumfries & Galloway
2901	A76	SB	SOUTH	Dumfries & Galloway
2901	A701	SB	SOUTH	Dumfries & Galloway
30	A74 (M)	NB	SOUTH	Strathclyde
3001	A74 (M)	SB	SOUTH	Strathclyde
31	A7	SB	SOUTH	The Borders
31	A68	SB	SOUTH	The Borders

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
31	A1	SB	SOUTH	Lothians
3101	A7	NB	SOUTH	The Borders
3101	A68	NB	SOUTH	The Borders
3101	A1	NB	SOUTH	Lothians
32	A82	NB	HIGHLAND	Highland
32	A9	NB	HIGHLAND	Highland
3201	A82	SB	HIGHLAND	Highland
3201	A9	SB	HIGHLAND	Highland
33	A83	EB	WEST	Argyll & Bute
33	A85	EB	WEST	Argyll & Bute
3301	A83	WB	WEST	Argyll & Bute
3301	A85	WB	WEST	Argyll & Bute
34	A82	EB	WEST	Central
3401	A82	WB	WEST	Central
35	A701	NB	SOUTH	The Borders
35	A70	NB	SOUTH	Strathclyde
35	A702	NB	SOUTH	Strathclyde
3501	A701	SB	SOUTH	The Borders
3501	A70	SB	SOUTH	Strathclyde
3501	A702	SB	SOUTH	Strathclyde
36	A96, B9103/ Road to Elginhill	EB	HIGHLAND	North East
36	A941, Thornhill Road	SB	HIGHLAND	North East
3601	A96, B9103 Road to Elginhill	WB	HIGHLAND	North East
3601	A941, Thornhill Road	NB	HIGHLAND	North East

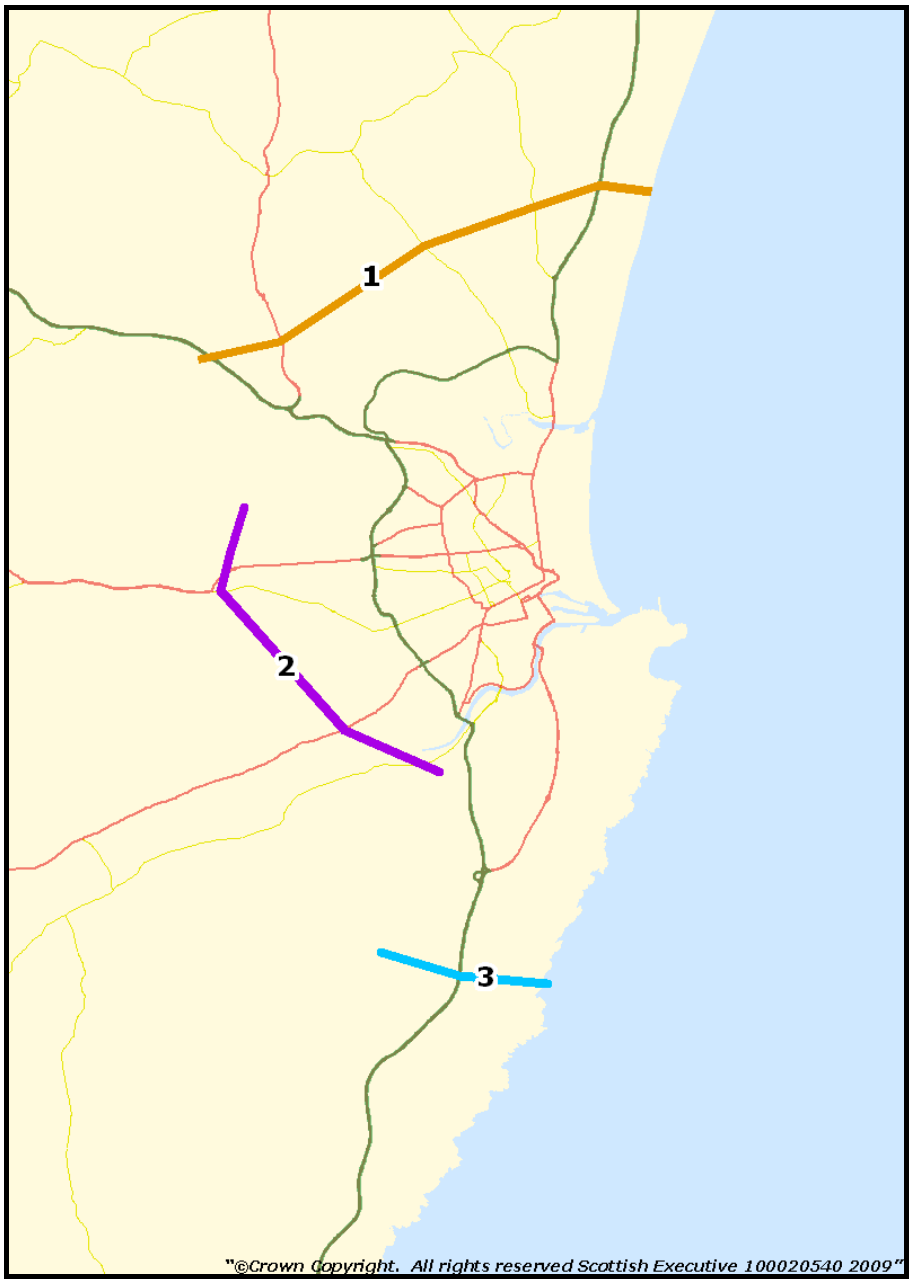
Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
37	A916, Elgin Limits/Derelict B	EB	HIGHLAND	North East
37	A941, Spynie Place/Myreside	SB	HIGHLAND	North East
3701	A941, Spynie Place/Myreside	NB	HIGHLAND	North East
3701	A916, Elgin Limits/Derelict B	WB	HIGHLAND	North East
38	A862, Beauly	NB	HIGHLAND	Highland
38	A9, North of Inverness	NB	HIGHLAND	Highland
3801	A862, Beauly	SB	HIGHLAND	Highland
3801	A9, North of Inverness	SB	HIGHLAND	Highland
39	A96, Outside Inverness	EB	HIGHLAND	Highland
39	Tomatin A9	SB	HIGHLAND	Highland
3901	A96, Outside Inverness	WB	HIGHLAND	Highland
3901	Tomatin A9	NB	HIGHLAND	Highland
40	A908, Alloa Road	SB	CENTRAL & TAYSIDE	Central
40	A907, Clackmannan Road	WB	CENTRAL & TAYSIDE	Central
40	A91, West Stirling Road	WB	CENTRAL & TAYSIDE	Central
40	Collyland Road	WB	CENTRAL & TAYSIDE	Central
40	B908	SB	CENTRAL & TAYSIDE	Central
4001	A91, West Stirling Road	EB	CENTRAL & TAYSIDE	Central
4001	A908, Alloa Road	NB	CENTRAL & TAYSIDE	Central

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
4001	A907, Clackmannan Road	EB	CENTRAL & TAYSIDE	Central
4001	Collyland Road	EB	CENTRAL & TAYSIDE	Central
4001	B908	NB	CENTRAL & TAYSIDE	Central
41	Livingston, A71	EB	CENTRAL & TAYSIDE	Lothians
41	Livingston, A705	EB	CENTRAL & TAYSIDE	Lothians
41	M8	EB	CENTRAL & TAYSIDE	Lothians
4101	Livingston, A705	WB	CENTRAL & TAYSIDE	Lothians
4101	Livingston, A71	WB	CENTRAL & TAYSIDE	Lothians
4101	M8	WB	CENTRAL & TAYSIDE	Lothians
42	A736, Cairnmount Road	SB	SOUTH	Ayrshire
42	A78, S of Meadowhead Avenue	NB	SOUTH	Ayrshire
42	Old Stewart Road	WB	SOUTH	Ayrshire
42	B7081, Main Road, Near Springside	WB	SOUTH	Ayrshire
42	A737	SB	SOUTH	Ayrshire
42	B7080	SB	SOUTH	Ayrshire
42	A78	NB	SOUTH	Ayrshire
42	A71	WB	SOUTH	Ayrshire
4201	B7081, Main Road, Near Springside	EB	SOUTH	Ayrshire
4201	A737	NB	SOUTH	Ayrshire
4201	A736, Cairnmount Road	NB	SOUTH	Ayrshire
4201	A78, S of	SB	SOUTH	Ayrshire

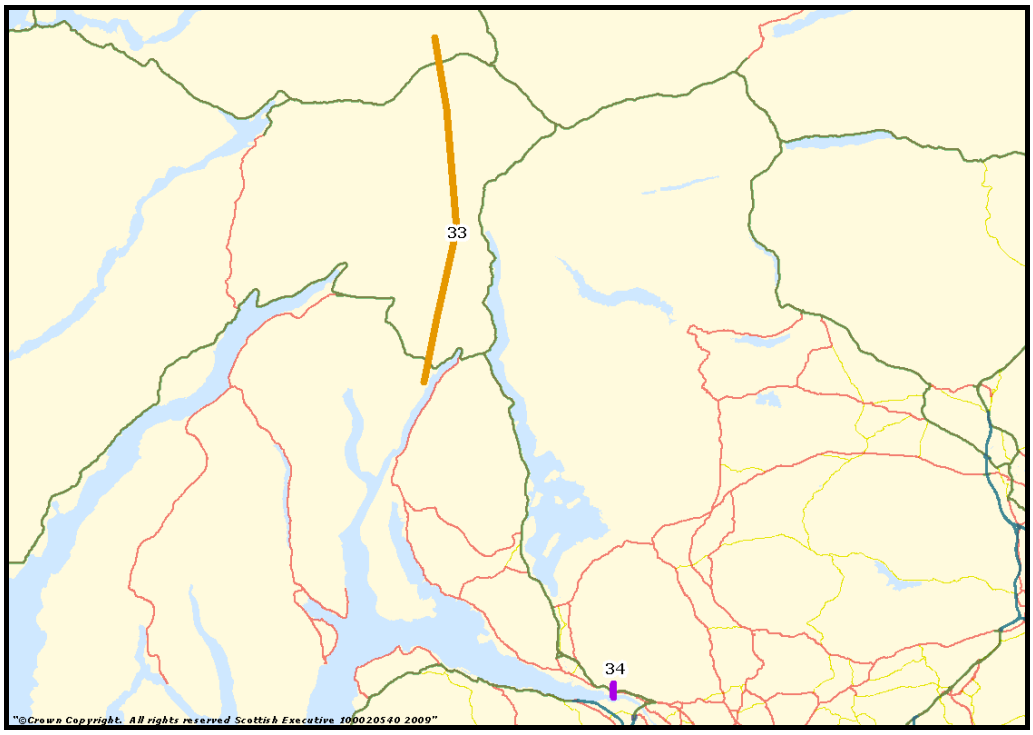
Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
	Meadowhead Av			
4201	A78	SB	SOUTH	Ayrshire
4201	A71	EB	SOUTH	Ayrshire
4201	B7080	NB	SOUTH	Ayrshire
43	B7081, Irvine Road	WB	SOUTH	Ayrshire
43	A71, West of Kilmarnock	WB	SOUTH	Ayrshire
43	A77, North of B7038 Kilmarnock	NB	SOUTH	Ayrshire
43	A735, Kilmaurs Road	NB	SOUTH	Ayrshire
4301	A735, Kilmaurs Road	SB	SOUTH	Ayrshire
4301	B7081, Irvine Road	EB	SOUTH	Ayrshire
4301	A71, West of Kilmarnock	EB	SOUTH	Ayrshire
4301	A77, N of B7038 Kilmarnock	SB	SOUTH	Ayrshire
4301	B7038	SB	SOUTH	Ayrshire
44	A74	NB	SOUTH	England & Wales
4401	A74	SB	SOUTH	England & Wales
45	A7	NB	SOUTH	Dumfries & Galloway
4501	A7	SB	SOUTH	Dumfries & Galloway
46	A6088	NB	SOUTH	The Borders
4601	A6088	SB	SOUTH	The Borders
47	A68	NB	SOUTH	The Borders
4701	A68	SB	SOUTH	The Borders
48	A698	EB	SOUTH	The Borders

Screenline Number	Road	Direction	Screenline Area	16 Sector Definition Area
4801	A698	WB	SOUTH	The Borders
49	A1	NB	SOUTH	The Borders
4901	A1	SB	SOUTH	The Borders

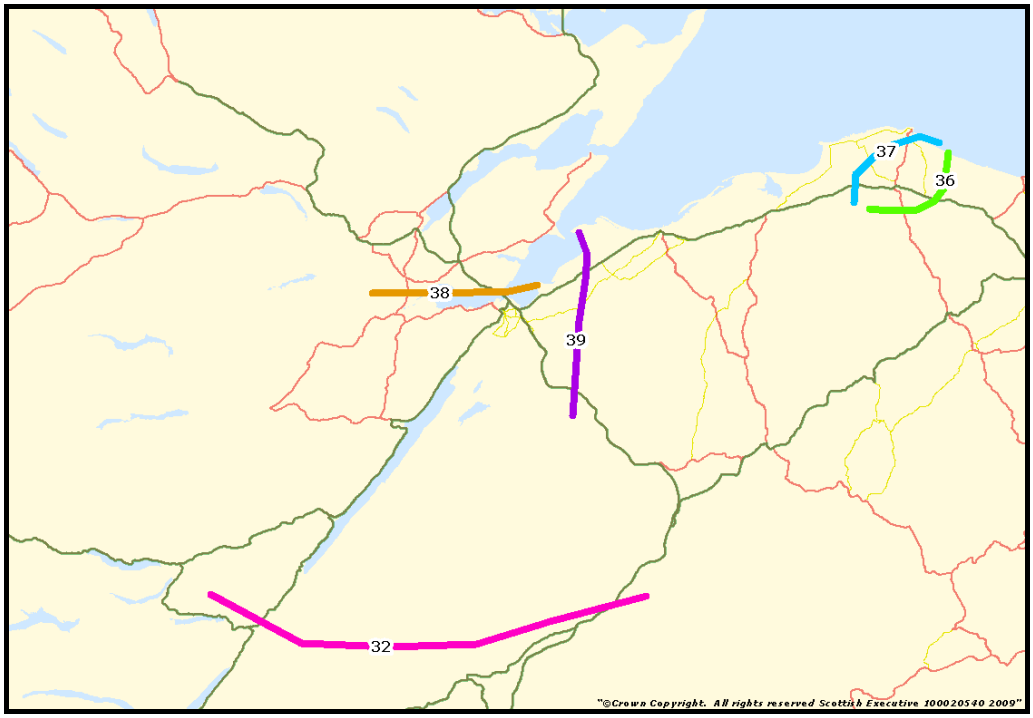
Appendix B – Screenline Graphical Plots



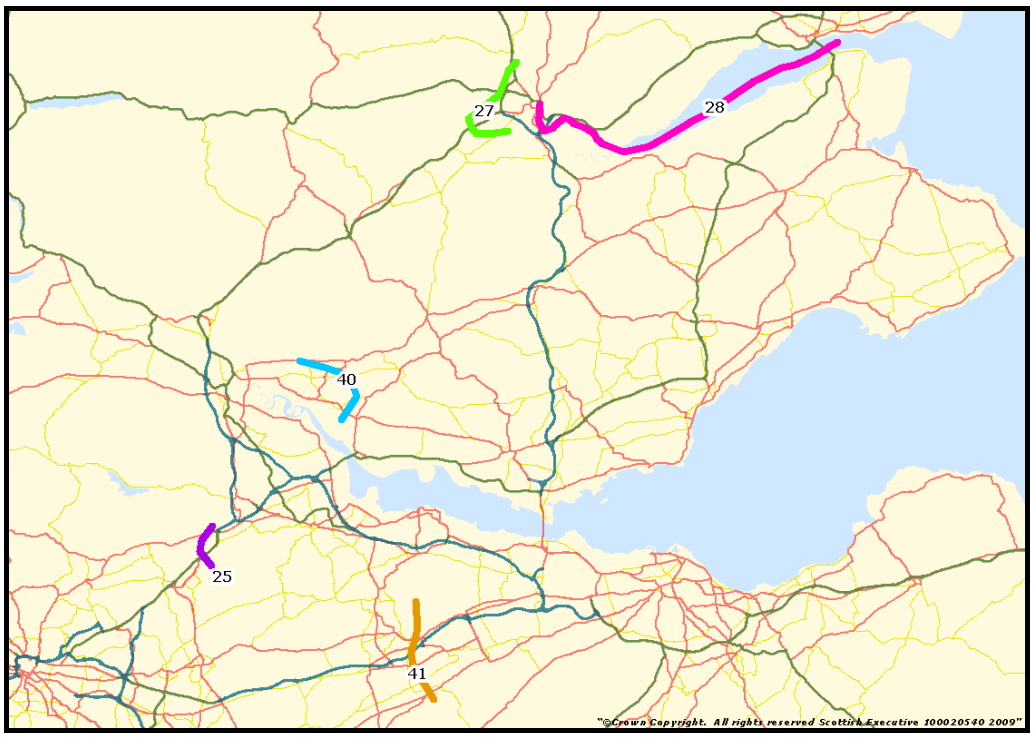
Aberdeen Area Screenlines



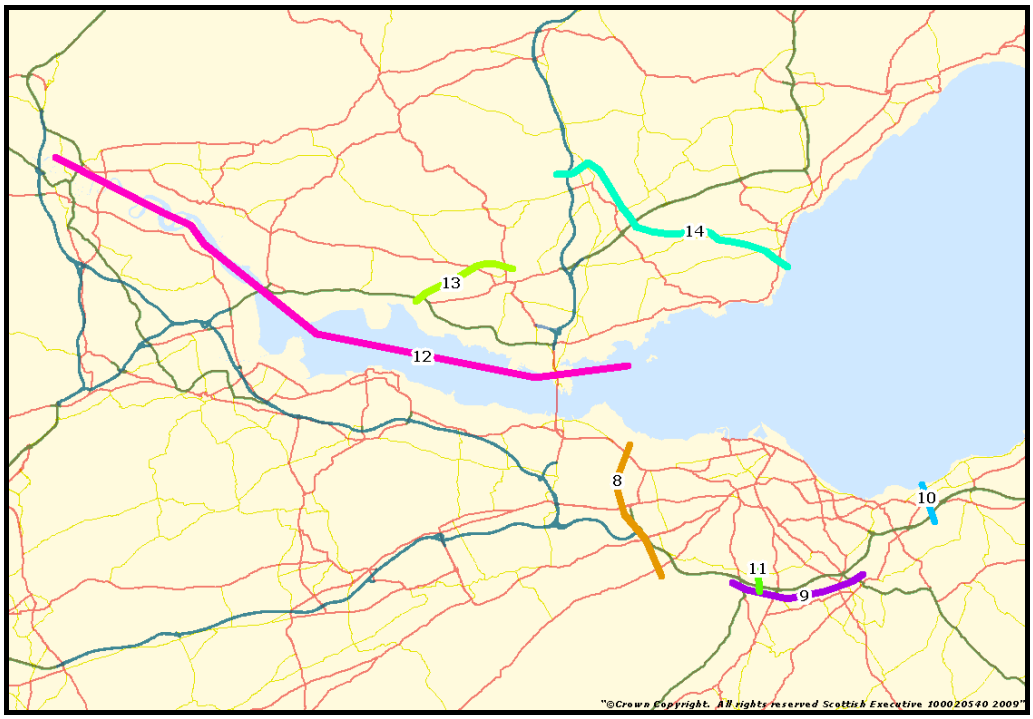
West Area Screenlines



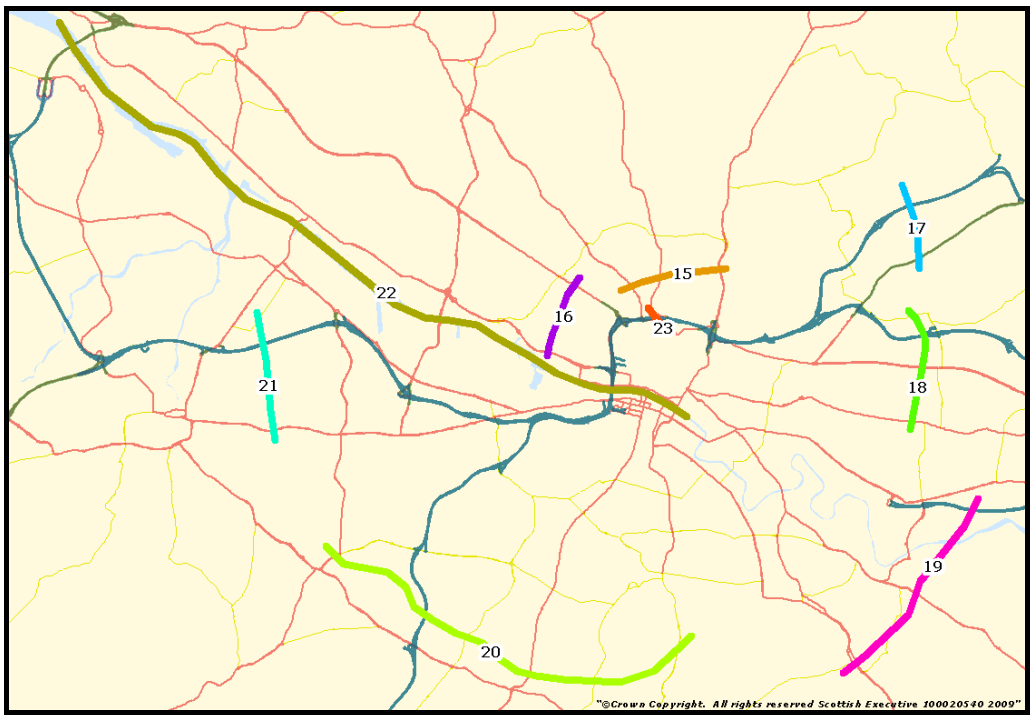
Highland Area Screenlines



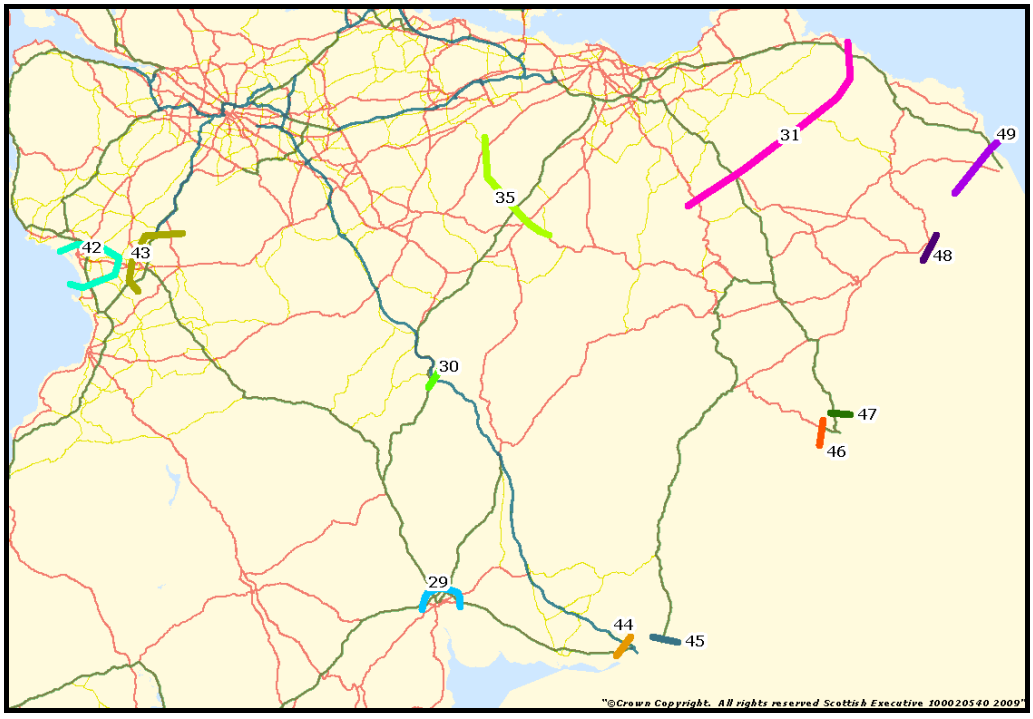
Central and Tayside Screenlines



Edinburgh Area Screenlines



Glasgow Area Screenlines



South Area Screenlines

Appendix C – Demand Total Matrix Comparisons

AM Peak Hour Prior Matrix Total Before Matrix Estimation (PCUs)

AM	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	5784	106	480	11	1	14	346	4	18	12	42	7	3	4	328	1	7158
Ayrshire	86	24548	217	41	3	82	1912	178	72	26	43	128	9	23	2891	33	30293
Central	371	235	28625	44	40	1596	6812	13	57	997	42	1457	99	407	4634	8	45437
City of Aberdeen	2	2	11	18503	18	12	5	0	21	17	24	1	2666	5	19	1	21306
City of Dundee	5	4	24	60	7663	41	10	16	10	471	34	9	1052	668	36	1	10104
City of Edinburgh	8	52	918	67	25	39960	341	29	55	1017	49	5507	42	171	683	260	49184
City of Glasgow	139	1256	3381	35	23	452	31775	41	115	108	18	608	8	33	10604	19	48613
Dumfries & Galloway	8	351	17	8	1	60	45	12089	161	5	16	71	3	1	166	63	13066
England & Wales	26	194	37	96	19	180	207	100	0	77	36	134	71	30	213	128	1547
Fife	33	21	1203	71	959	1698	144	1	32	24040	50	633	190	1016	279	6	30377
Highland	38	62	19	125	66	15	14	1	38	14	23403	9	335	72	19	2	24232
Lothians	5	97	1228	45	17	9600	545	63	51	430	34	15929	20	54	1475	205	29797
North East	7	6	24	7514	2021	38	14	1	71	180	339	14	22585	391	16	2	33222
Perthshire & Kinross	6	26	565	33	1033	228	82	13	84	828	73	78	251	9249	104	3	12655
Strathclyde	184	2375	3735	55	73	1110	17728	210	139	286	117	2467	57	119	56557	55	85268
The Borders	1	25	25	3	1	725	52	84	157	19	1	487	3	1	90	6206	7879
Total	6700	29361	40507	26710	11964	55808	60031	12843	1081	28525	24321	27539	27394	12245	78114	6994	450136

AM Peak Hour Final Matrix Total After Matrix Estimation (PCUs)

AM	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	5805	92	475	7	1	11	353	4	22	10	41	6	3	3	271	1	7102
Ayrshire	94	26483	174	37	3	66	1563	176	103	19	43	109	8	19	2634	34	31566
Central	391	225	28697	46	50	1546	6658	14	82	907	26	1421	118	399	4342	8	44931
City of Aberdeen	2	4	14	17849	18	19	7	0	26	22	27	2	2769	5	28	2	20793
City of Dundee	8	5	33	55	7562	64	13	17	11	563	24	15	1046	694	45	1	10156
City of Edinburgh	6	42	743	144	49	39928	258	40	74	1154	39	5974	102	240	630	308	49731
City of Glasgow	157	1369	3581	39	30	500	33156	40	151	107	17	631	10	37	10876	19	50720
Dumfries & Galloway	6	330	18	9	2	72	39	12006	239	5	10	75	3	2	163	70	13049
England & Wales	15	154	36	114	27	199	192	105	0	92	30	156	93	35	228	159	1634
Fife	29	19	1164	89	1353	1786	113	1	29	24167	36	724	274	1125	253	7	31168
Highland	38	57	23	99	65	21	15	2	58	16	23521	13	301	81	19	3	24334
Lothians	3	71	1199	114	34	9862	459	65	87	575	27	16242	36	90	1529	268	30660
North East	7	9	34	7555	1990	63	19	1	112	224	331	24	22539	423	21	2	33353
Perthshire & Kinross	6	25	575	30	1049	267	78	16	127	877	48	95	255	9233	98	3	12781
Strathclyde	204	2388	3710	54	97	1148	17172	244	196	284	73	2398	67	124	56431	55	84645
The Borders	0	28	22	3	1	743	47	91	181	18	0	533	4	1	84	6146	7904
Total	6770	31299	40499	26244	12332	56297	60139	12821	1499	29040	24294	28418	27629	12510	77652	7086	454529

AM Peak Hour Total PCU Differences

AM	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	21	-15	-5	-4	0	-2	6	0	4	-2	-1	-1	0	0	-56	0	-56
Ayrshire	8	1935	-43	-4	0	-16	-349	-2	30	-6	0	-18	-1	-4	-257	1	1273
Central	20	-11	72	1	10	-50	-155	2	26	-89	-16	-35	18	-8	-292	0	-505
City of Aberdeen	0	1	4	-654	0	8	1	0	5	5	3	0	103	0	9	1	-513
City of Dundee	2	1	10	-4	-101	23	3	1	2	92	-10	6	-6	25	9	0	52
City of Edinburgh	-2	-10	-175	77	24	-31	-84	10	19	137	-10	467	60	69	-53	48	547
City of Glasgow	18	113	200	5	7	48	1381	-1	36	-1	-1	23	2	3	272	0	2107
Dumfries & Galloway	-2	-21	1	1	0	12	-6	-83	78	0	-6	4	1	0	-3	7	-17
England & Wales	-11	-40	-1	18	8	19	-15	5	0	15	-6	22	23	5	14	31	87
Fife	-4	-2	-39	18	394	89	-32	0	-3	127	-13	90	84	109	-26	1	791
Highland	0	-5	4	-26	-1	6	1	0	20	3	119	5	-34	9	0	1	102
Lothians	-2	-26	-28	70	17	262	-86	2	36	145	-7	313	16	36	54	63	864
North East	0	3	10	41	-31	26	5	0	42	43	-8	10	-46	32	5	1	131
Perthshire & Kinross	0	-1	10	-4	16	39	-4	3	43	49	-25	16	4	-15	-6	0	126
Strathclyde	21	12	-26	-1	24	39	-556	34	57	-2	-44	-68	9	5	-126	-1	-623
The Borders	0	3	-3	1	0	18	-5	7	24	-1	0	46	1	0	-6	-61	26
Total	70	1938	-8	-466	368	488	108	-22	419	515	-27	879	235	265	-462	92	4393

Average Inter Peak Hour Prior Matrix Total Before Matrix Estimation (PCUs)

IP	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	4699	22	246	1	1	2	158	18	43	6	50	2	2	8	103	0	5361
Ayrshire	20	19355	141	7	2	24	1005	129	95	8	10	97	5	2	1988	15	22901
Central	242	202	21706	14	37	739	4443	12	106	950	65	1283	54	316	3574	9	33752
City of Aberdeen	2	9	17	13768	42	18	6	2	53	20	67	9	2868	12	23	1	16918
City of Dundee	0	4	33	24	7154	33	10	0	21	468	23	16	1304	581	138	1	9812
City of Edinburgh	2	52	727	33	51	33010	209	43	139	807	19	5707	33	133	533	254	41752
City of Glasgow	165	1386	4336	6	11	228	30043	31	199	77	28	446	16	29	12537	29	49567
Dumfries & Galloway	12	350	18	1	0	48	40	9977	139	2	9	50	1	2	128	55	10832
England & Wales	35	164	75	47	23	110	155	143	0	51	153	221	34	23	252	238	1723
Fife	6	19	945	15	442	747	69	1	50	19379	24	333	98	663	196	6	22993
Highland	43	11	17	36	10	7	15	10	31	11	17559	3	402	48	34	2	18239
Lothians	2	131	1148	26	14	5302	347	33	180	379	21	12393	19	40	1580	224	21837
North East	2	12	28	2689	1266	15	7	1	39	98	224	8	18927	181	16	4	23517
Perthshire & Kinross	15	8	328	8	569	94	32	2	35	633	69	33	183	7125	65	4	9203
Strathclyde	96	2615	3527	17	111	510	13012	118	364	181	71	1696	30	55	41681	66	64152
The Borders	0	20	11	0	2	240	20	63	274	5	2	220	4	5	60	5417	6345
Total	5341	24361	33303	16692	9734	41126	49571	10584	1767	23075	18395	22517	23981	9222	62908	6326	358904

Average Inter Peak Hour Final Matrix Total After Matrix Estimation (PCUs)

IP	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	4776	22	256	2	1	2	147	16	46	5	54	1	3	11	108	0	5451
Ayrshire	18	20342	97	8	2	18	810	131	94	4	6	65	5	2	1776	14	23391
Central	261	124	21981	24	45	737	4160	11	115	789	79	1237	70	315	3242	8	33198
City of Aberdeen	4	9	25	13519	42	33	10	3	72	29	47	16	2982	14	38	1	16843
City of Dundee	0	5	59	27	7085	59	17	0	26	612	16	30	1291	593	177	2	9999
City of Edinburgh	2	40	651	38	82	33316	162	51	152	821	26	5872	42	217	523	279	42274
City of Glasgow	165	988	4060	8	14	189	29707	25	214	46	27	360	14	25	11664	23	47530
Dumfries & Galloway	8	321	15	2	0	59	30	9903	143	2	6	48	2	2	124	66	10730
England & Wales	28	159	72	70	38	134	137	157	0	47	116	220	48	28	244	302	1798
Fife	5	8	839	22	426	800	54	1	38	19612	25	371	102	778	166	7	23255
Highland	44	8	45	21	13	20	31	8	59	26	17756	8	267	79	68	7	18460
Lothians	1	85	1108	33	23	5328	273	37	181	400	21	12611	25	61	1569	256	22013
North East	4	13	50	2977	1261	31	11	1	61	134	197	16	18517	194	26	8	23502
Perthshire & Kinross	22	4	352	10	609	128	31	1	45	728	50	43	190	7190	66	6	9476
Strathclyde	97	2148	3117	25	151	506	11894	124	453	125	55	1553	32	48	41703	71	62103
The Borders	0	19	9	1	2	254	15	61	302	5	3	255	6	7	63	5293	6292
Total	5436	24296	32736	16787	9794	41613	47490	10533	2001	23383	18483	22704	23596	9562	61558	6342	356316

PM Peak Hour Prior Matrix Total Before Matrix Estimation (PCUs)

PM	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	7414	71	503	2	1	7	199	10	60	27	63	5	7	6	191	1	8566
Ayrshire	35	29084	180	4	2	28	1287	234	74	14	18	56	5	7	2371	26	33425
Central	483	224	33406	13	19	1086	5583	8	107	1288	30	1576	26	526	4643	28	49044
City of Aberdeen	10	42	45	21741	60	52	38	7	165	75	128	25	7054	29	66	3	29538
City of Dundee	1	8	38	20	10389	25	19	1	24	986	78	15	2284	1075	92	1	15055
City of Edinburgh	11	92	1480	15	46	44690	359	36	263	1772	56	10916	45	297	965	658	61701
City of Glasgow	380	2278	8292	8	10	428	39169	44	231	131	40	663	24	87	22630	40	74454
Dumfries & Galloway	4	247	14	1	8	23	54	14658	185	1	3	31	2	1	146	56	15435
England & Wales	33	131	87	34	16	104	202	233	0	57	57	167	106	90	231	286	1831
Fife	12	29	1229	24	583	1091	113	3	72	29662	26	441	148	905	250	15	34605
Highland	58	21	13	21	23	10	62	2	54	11	28941	4	266	58	15	1	29561
Lothians	6	76	1692	8	9	6973	578	23	228	633	47	19672	13	91	2344	438	32831
North East	3	5	30	3439	1424	21	9	2	73	118	255	15	30470	262	13	4	36141
Perthshire & Kinross	4	19	454	7	803	321	38	1	79	1087	111	47	371	11577	101	20	15038
Strathclyde	306	3358	4885	9	13	675	16368	153	302	215	21	1821	14	79	64403	219	92843
The Borders	1	43	8	1	1	322	49	77	251	7	1	357	2	3	231	8836	10188
Total	8761	35727	52355	25347	13407	55857	64127	15491	2168	36083	29873	35811	40835	15092	98691	10632	540257

PM Peak Hour Final Matrix Total After Matrix Estimation (PCUs)

PM	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	7468	70	514	3	2	8	203	8	47	21	64	4	7	6	195	1	8623
Ayrshire	35	31175	123	6	2	22	1151	230	54	6	19	42	4	5	2280	28	35182
Central	514	153	33801	20	30	1008	5257	9	103	1053	31	1521	37	533	4257	29	48354
City of Aberdeen	9	32	53	21144	46	64	51	6	135	74	116	33	7084	23	75	4	28948
City of Dundee	1	7	69	23	10300	39	26	1	28	1215	61	25	2269	1109	175	1	15349
City of Edinburgh	10	45	1288	43	79	44592	270	42	245	2045	58	10762	92	426	900	761	61659
City of Glasgow	374	1725	7741	13	15	354	38175	38	205	78	30	556	29	88	19765	30	69216
Dumfries & Galloway	3	234	13	1	9	28	47	14248	174	1	2	36	3	1	160	57	15018
England & Wales	22	114	89	72	32	114	199	266	0	56	60	235	183	94	244	329	2108
Fife	9	14	1064	38	632	1069	83	3	52	30028	21	455	176	975	224	17	34858
Highland	59	22	21	21	24	15	85	3	71	15	29026	7	245	79	20	1	29715
Lothians	4	48	1623	14	13	6732	473	27	253	688	45	19968	22	114	2412	567	33004
North East	4	5	51	3534	1409	41	15	2	90	147	238	25	30328	275	22	10	36194
Perthshire & Kinross	4	13	493	7	848	322	43	0	64	1133	88	51	413	11575	103	25	15185
Strathclyde	290	3198	4322	14	20	640	14550	150	306	138	19	1856	19	74	64256	197	90047
The Borders	1	51	6	3	1	343	29	87	280	7	0	453	2	3	227	8650	10143
Total	8806	36906	51273	24956	13463	55390	60656	15119	2107	36705	29878	36028	40914	15379	95316	10706	533603

Average Inter Peak Hour Total PCU Differences

IP	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	77	-1	10	1	0	0	-11	-2	3	-1	4	-1	1	4	5	0	90
Ayrshire	-1	987	-44	1	0	-6	-195	2	0	-4	-4	-32	0	-1	-212	0	490
Central	20	-79	275	10	8	-1	-283	-1	9	-161	14	-47	16	-1	-331	-1	-554
City of Aberdeen	2	0	8	-249	0	15	4	1	19	9	-21	7	114	1	15	1	-74
City of Dundee	0	0	25	2	-69	26	7	0	5	144	-7	14	-13	12	40	1	187
City of Edinburgh	0	-12	-76	5	31	306	-47	8	13	14	7	164	9	84	-10	25	522
City of Glasgow	0	-398	-276	2	4	-39	-336	-6	15	-31	-1	-86	-2	-4	-872	-7	-2037
Dumfries & Galloway	-4	-29	-3	1	0	11	-10	-74	4	-1	-3	-2	0	0	-3	11	-103
England & Wales	-7	-4	-3	23	16	25	-18	15	0	-4	-38	-1	13	4	-8	63	75
Fife	-1	-11	-106	6	-16	54	-14	0	-11	233	0	38	4	116	-30	1	262
Highland	1	-2	27	-15	3	13	16	-2	27	15	197	5	-134	31	34	4	221
Lothians	-1	-46	-39	8	8	26	-74	4	1	21	0	219	6	22	-11	32	176
North East	2	1	22	288	-5	15	4	1	22	36	-27	8	-410	13	10	4	-15
Perthshire & Kinross	7	-4	25	2	40	35	-1	0	9	95	-19	10	7	65	0	2	273
Strathclyde	1	-468	-410	8	40	-4	-1118	6	90	-56	-17	-143	2	-7	22	4	-2049
The Borders	0	-2	-2	0	0	14	-5	-2	28	0	1	34	1	2	3	-125	-53
Total	95	-66	-566	95	60	487	-2081	-51	234	309	88	187	-385	341	-1350	16	-2587

PM Peak Hour Total PCU Differences

PM	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	54	-1	12	1	1	1	4	-2	-13	-6	1	-1	0	1	4	0	56
Ayrshire	0	2091	-57	2	0	-7	-137	-4	-20	-8	1	-15	0	-2	-91	2	1757
Central	31	-71	395	8	10	-78	-326	1	-5	-235	1	-55	11	7	-386	1	-690
City of Aberdeen	-2	-10	8	-596	-14	12	14	-1	-30	-1	-12	8	30	-6	9	1	-590
City of Dundee	0	0	31	2	-88	13	7	0	4	230	-18	10	-15	34	83	0	294
City of Edinburgh	-2	-47	-192	27	33	-98	-89	6	-17	273	2	-154	47	129	-64	104	-43
City of Glasgow	-6	-553	-551	5	6	-74	-994	-6	-26	-53	-10	-107	5	1	-2866	-10	-5238
Dumfries & Galloway	-1	-13	0	1	0	5	-7	-411	-11	0	-1	4	1	0	15	1	-417
England & Wales	-11	-16	2	39	16	10	-3	33	0	-1	3	68	77	4	13	43	277
Fife	-3	-15	-166	13	49	-22	-31	-1	-20	366	-5	14	28	70	-26	2	254
Highland	0	1	8	0	1	4	23	1	17	5	86	2	-20	21	5	0	154
Lothians	-2	-28	-68	5	5	-241	-105	4	25	55	-2	296	9	23	67	129	173
North East	1	0	21	94	-15	20	6	0	17	29	-17	10	-141	13	9	5	53
Perthshire & Kinross	0	-6	39	1	45	1	5	0	-15	46	-23	4	42	-1	3	5	147
Strathclyde	-16	-160	-562	4	7	-35	-1818	-3	3	-78	-3	35	5	-5	-147	-22	-2796
The Borders	0	8	-2	2	0	20	-19	10	29	0	0	97	1	0	-4	-186	-45
Total	45	1179	-1082	-391	56	-467	-3471	-372	-61	622	5	217	78	287	-3375	75	-6654

Appendix D – Modelled Flow vs Observed Count

AM Peak Hour – Aggregate Modelled Screenline Flow by Area versus Aggregate Observed Screenline Count by Area

AM Peak Hour						
Area	**Aggregate Observed PCU Count**	**Prior – Aggregate PCU Flow**	**% Diff**	**Final – Aggregate PCU Flow**	**% Diff**	**Improvement?**
Argyll & Bute	394	413	5%	346	-12%	NO
Ayrshire	20,489	16,939	-17%	19,880	-3%	YES
Central	16,296	16,832	3%	16,507	1%	YES
City of Aberdeen	7,706	9,578	24%	8,842	15%	YES
City of Edinburgh	34,616	34,701	0%	36,072	4%	NO
City of Glasgow	74,299	78,231	5%	76,357	3%	YES
Dumfries & Galloway	5,809	5,888	1%	5,984	3%	NO
England & Wales	2,380	1,677	-30%	2,008	-16%	YES
Fife	13,882	12,017	-13%	14,353	3%	YES
Highland	5,617	5,821	4%	5,753	2%	YES
Lothians	20,748	18,112	-13%	19,633	-5%	YES
North East	8,805	8,534	-3%	8,705	-1%	YES
Perthshire & Kinross	8,272	7,148	-14%	7,553	-9%	YES
Strathclyde	35,206	34,657	-2%	34,403	-2%	NO
The Borders	2,401	2,540	6%	2,585	8%	NO

Notes:

1. 'Prior – Aggregate PCU Flow' implies **before** matrix estimation and 'Final – Aggregate PCU Flow' implies **after** matrix estimation; and
2. 'Improvement?' refers to a comparison between **before** and **after** matrix estimation Aggregate PCU flow and Aggregate PCU count. An improvement implies the absolute difference between Aggregate PCU count and Aggregate PCU flow is smaller, and hence closer to the observed.

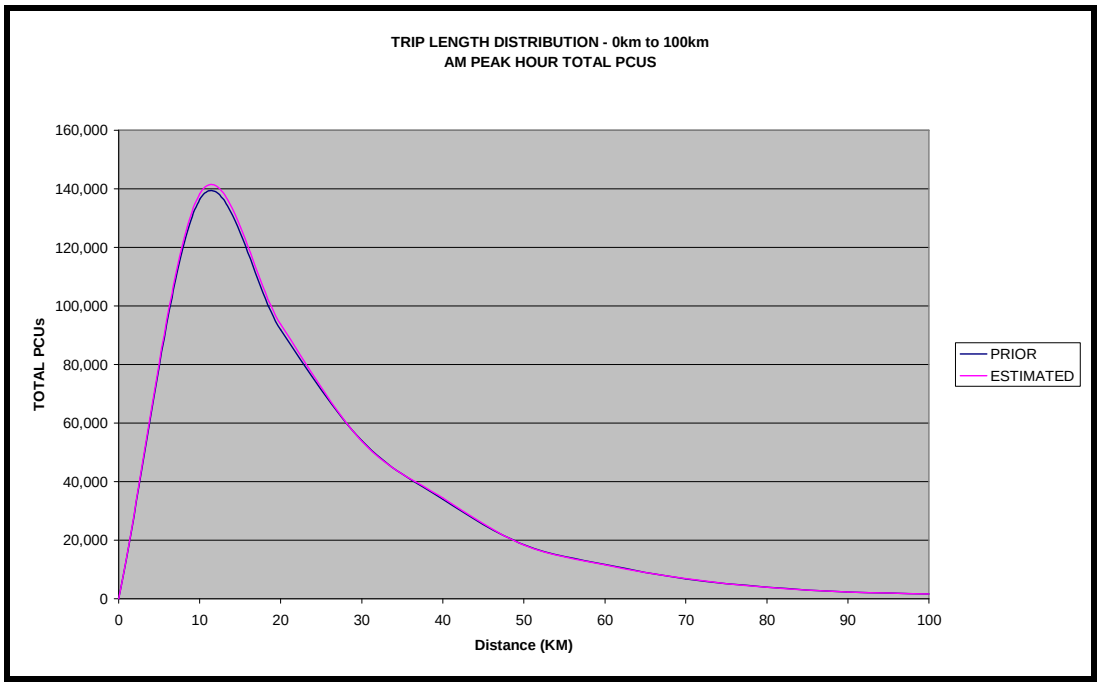
Average Inter Peak Hour – Aggregate Modelled Screenline Flow by Area versus Aggregate Observed Screenline Count by Area

Inter Peak						
Area	**Aggregate Observed PCU Count**	**Prior – Aggregate PCU Flow**	**% Diff**	**Final – Aggregate PCU Flow**	**% Diff**	**Improvement?**
Argyll & Bute	536	237	-56%	412	-23%	YES
Ayrshire	12,903	14,441	12%	12,999	1%	YES
Central	9,960	10,711	8%	10,079	1%	YES
City of Aberdeen	5,221	5,514	6%	5,463	5%	YES
City of Edinburgh	23,853	23,442	-2%	24,560	3%	NO
City of Glasgow	55,756	70,951	27%	59,515	7%	YES
Dumfries & Galloway	4,870	5,206	7%	5,233	7%	NO
England & Wales	2,676	2,082	-22%	2,266	-15%	YES
Fife	9,579	8,559	-11%	9,712	1%	YES
Highland	5,041	4,732	-6%	5,124	2%	YES
Lothians	15,215	14,769	-3%	14,552	-4%	NO
North East	5,947	6,691	13%	6,214	4%	YES
Perthshire & Kinross	7,034	5,311	-24%	6,303	-10%	YES
Strathclyde	27,119	30,203	11%	27,017	0%	YES
The Borders	2,552	2,645	4%	2,828	11%	NO

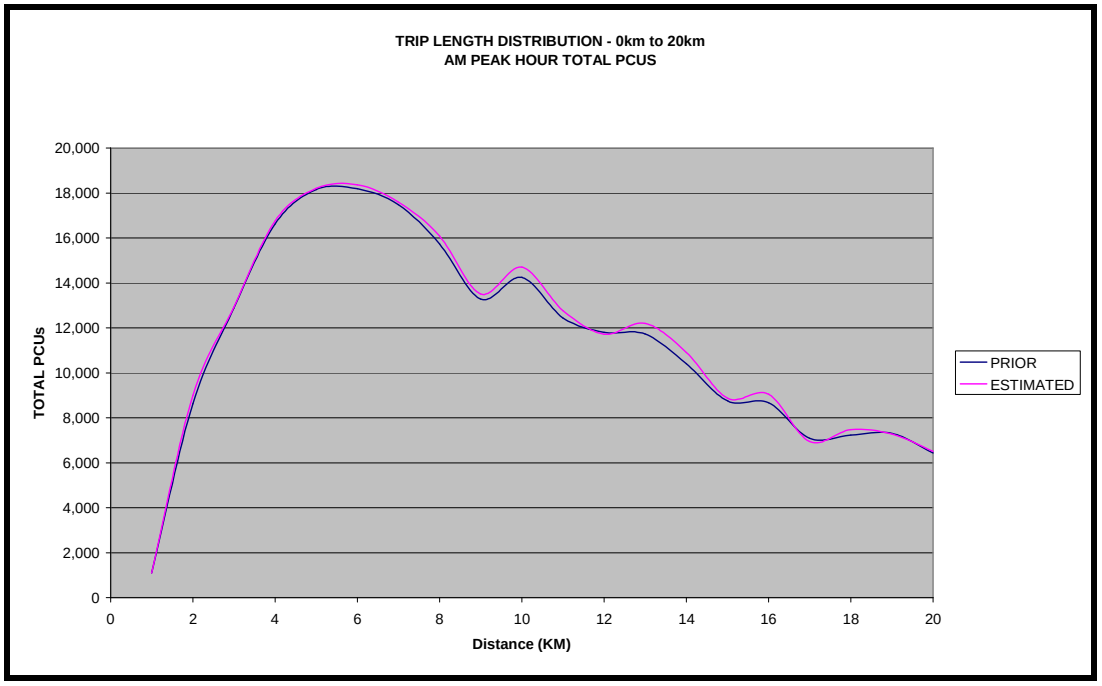
PM Peak Hour – Aggregate Modelled Screenline Flow by Area versus Aggregate Observed Screenline Count by Area

PM Peak Hour						
Area	**Aggregate Observed PCU Count**	**Prior – Aggregate PCU Flow**	**% Diff**	**Final – Aggregate PCU Flow**	**% Diff**	**Improvement?**
Argyll & Bute	560	394	-30%	442	-21%	YES
Ayrshire	21,124	17,255	-18%	20,561	-3%	YES
Central	17,680	19,068	8%	17,717	0%	YES
City of Aberdeen	8,651	9,953	15%	9,276	7%	YES
City of Edinburgh	35,220	37,870	8%	37,252	6%	YES
City of Glasgow	73,049	95,974	31%	79,711	9%	YES
Dumfries & Galloway	5,808	6,968	20%	6,132	6%	YES
England & Wales	2,986	2,452	-18%	2,641	-12%	YES
Fife	14,142	12,947	-8%	14,380	2%	YES
Highland	6,483	6,362	-2%	6,571	1%	YES
Lothians	21,831	20,434	-6%	20,745	-5%	YES
North East	9,489	9,734	3%	9,603	1%	YES
Perthshire & Kinross	8,882	7,197	-19%	8,387	-6%	YES
Strathclyde	36,650	41,773	14%	37,544	2%	YES
The Borders	3,238	3,508	8%	3,302	2%	YES

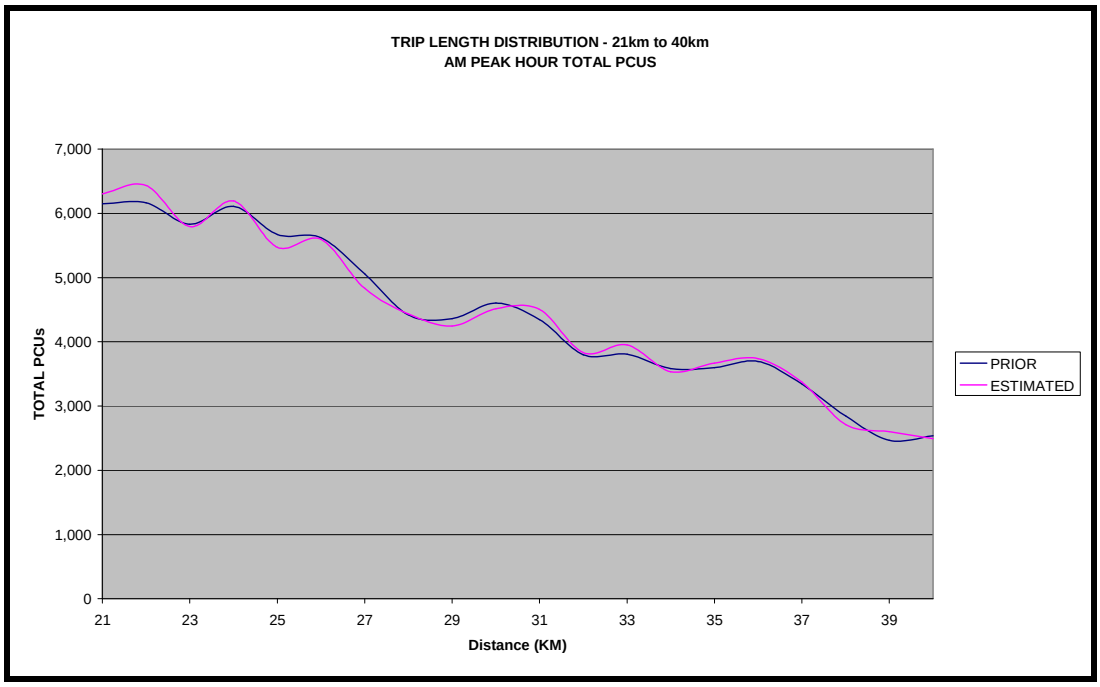
Appendix E – Trip Length Distribution Analysis



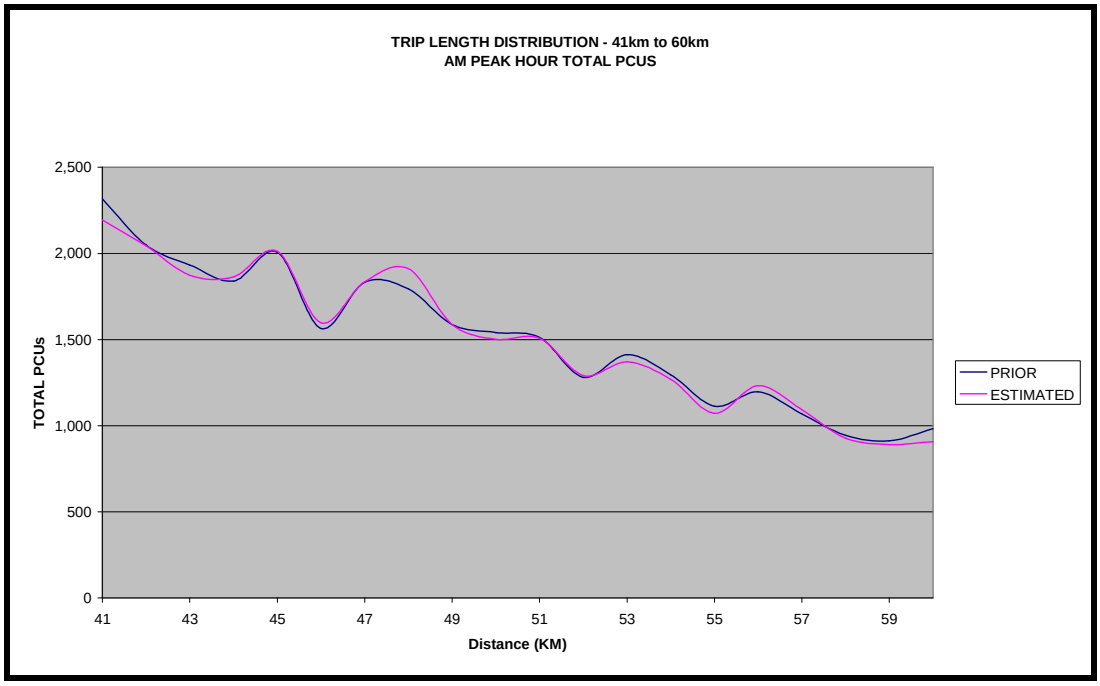
AM Peak Hour Trip Length Distribution – 0km to 100km



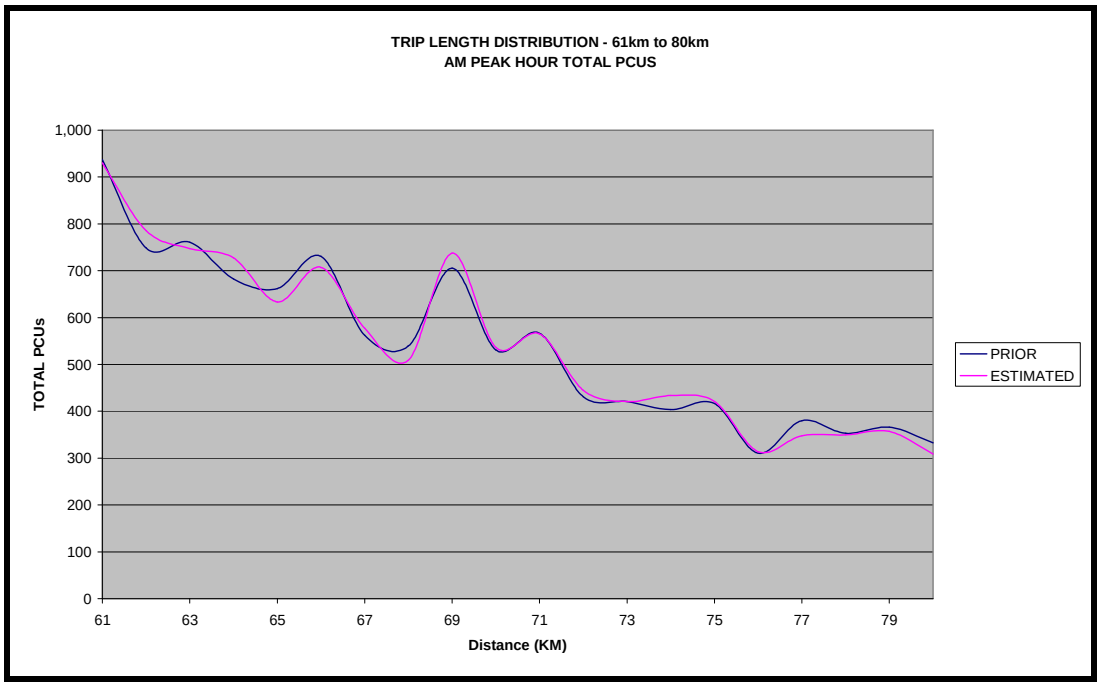
AM Peak Hour Trip Length Distribution – 0km to 20km



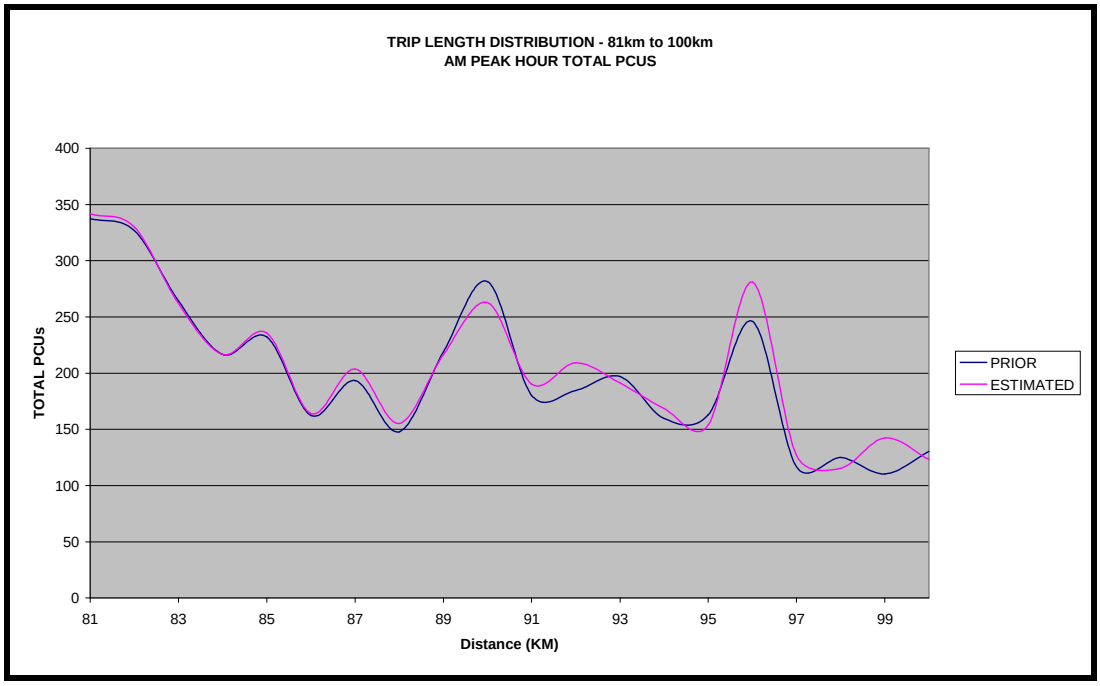
AM Peak Hour Trip Length Distribution – 21km to 40km



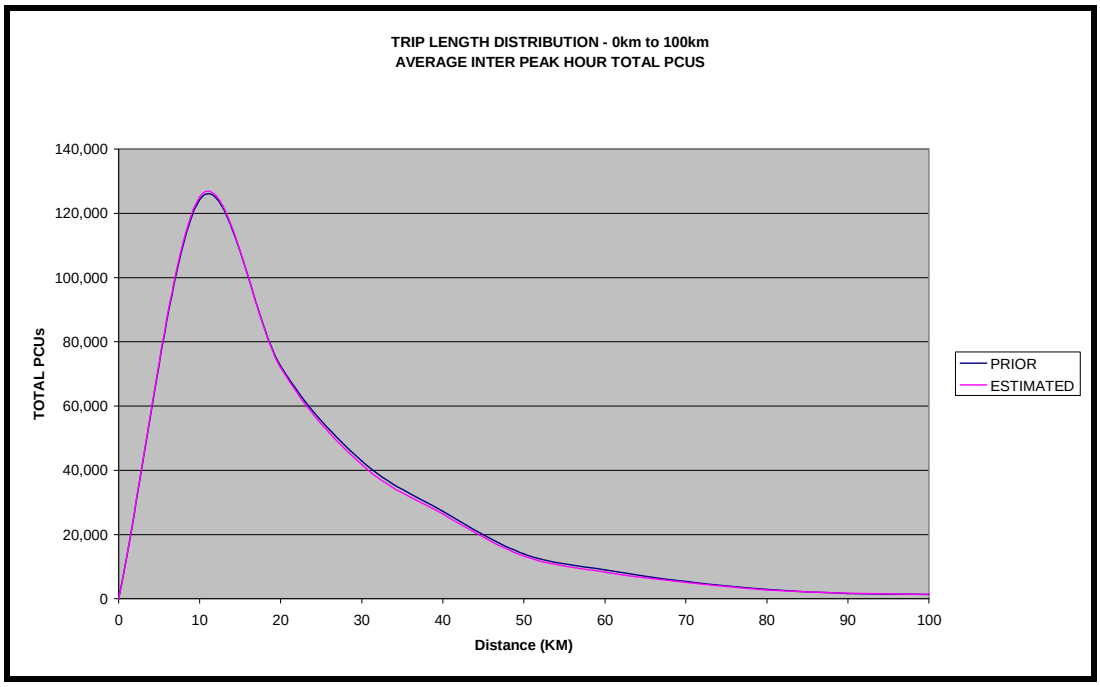
AM Peak Hour Trip Length Distribution – 41km to 60km



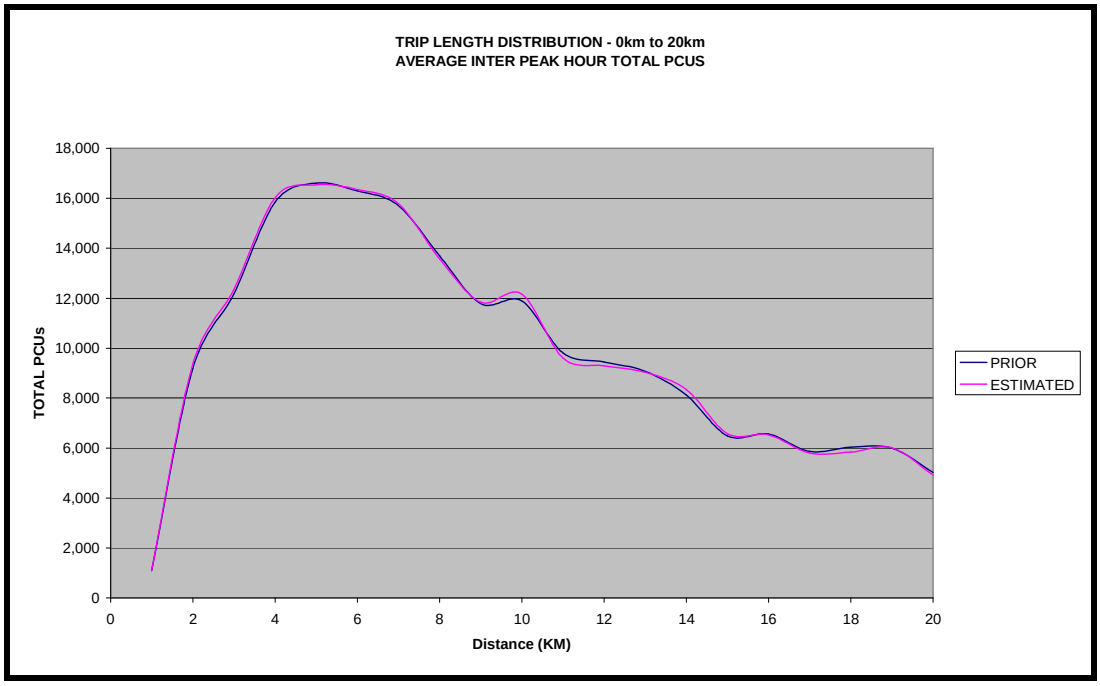
AM Peak Hour Trip Length Distribution – 61km to 80km



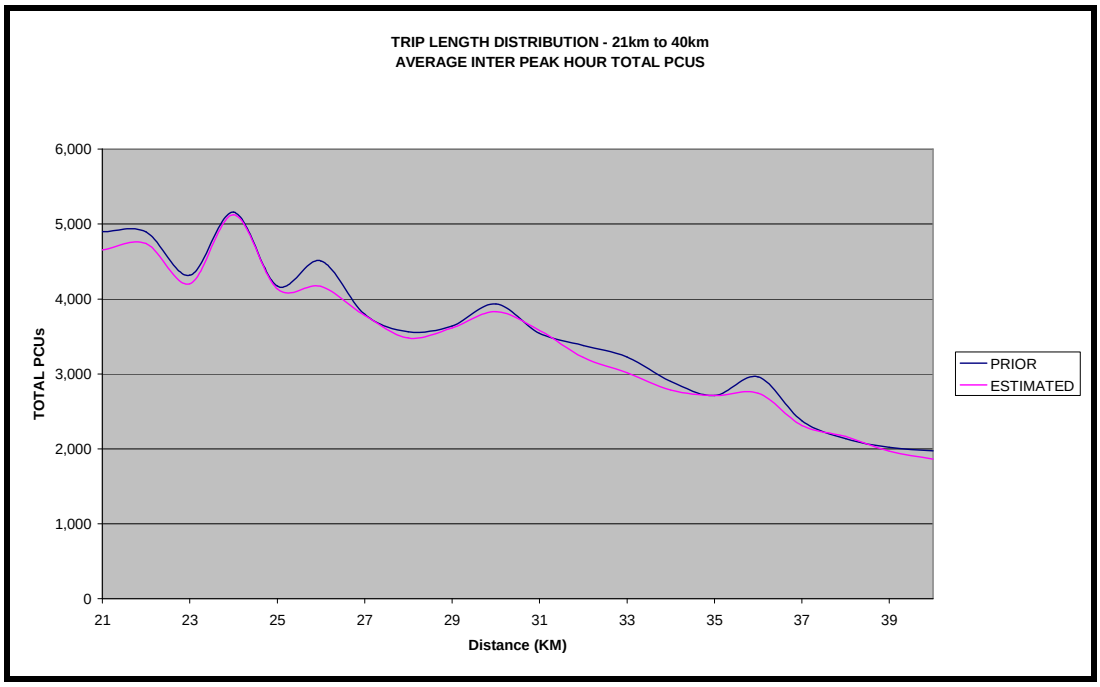
AM Peak Hour Trip Length Distribution – 81km to 100km



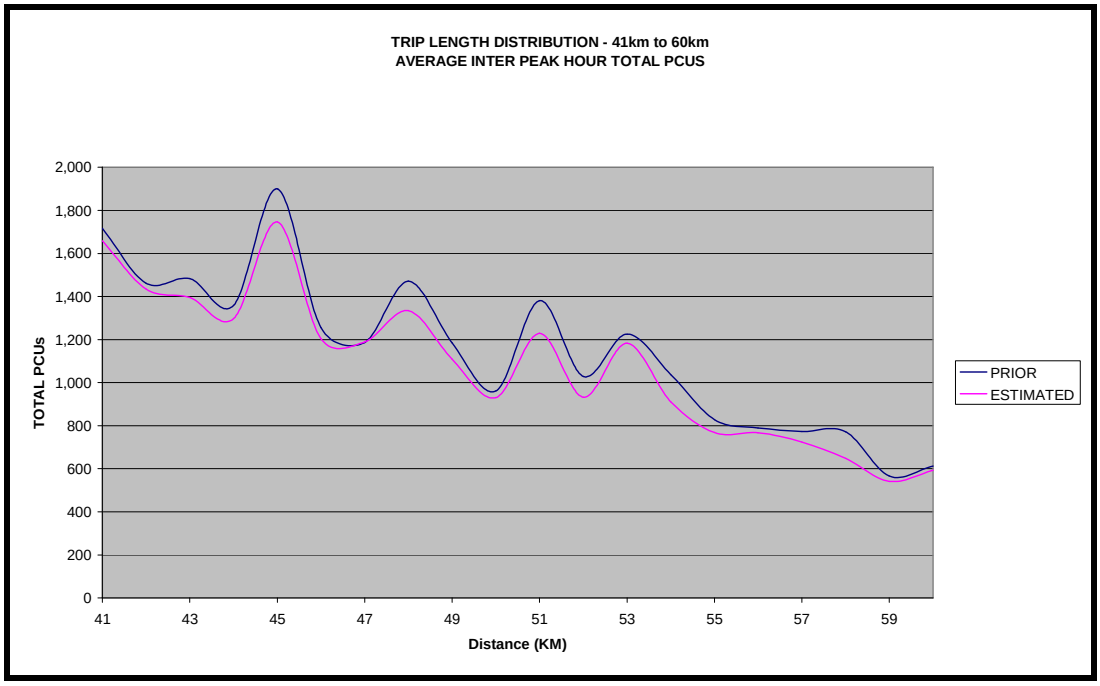
Average Inter Peak Hour Trip Length Distribution – 0km to 100km



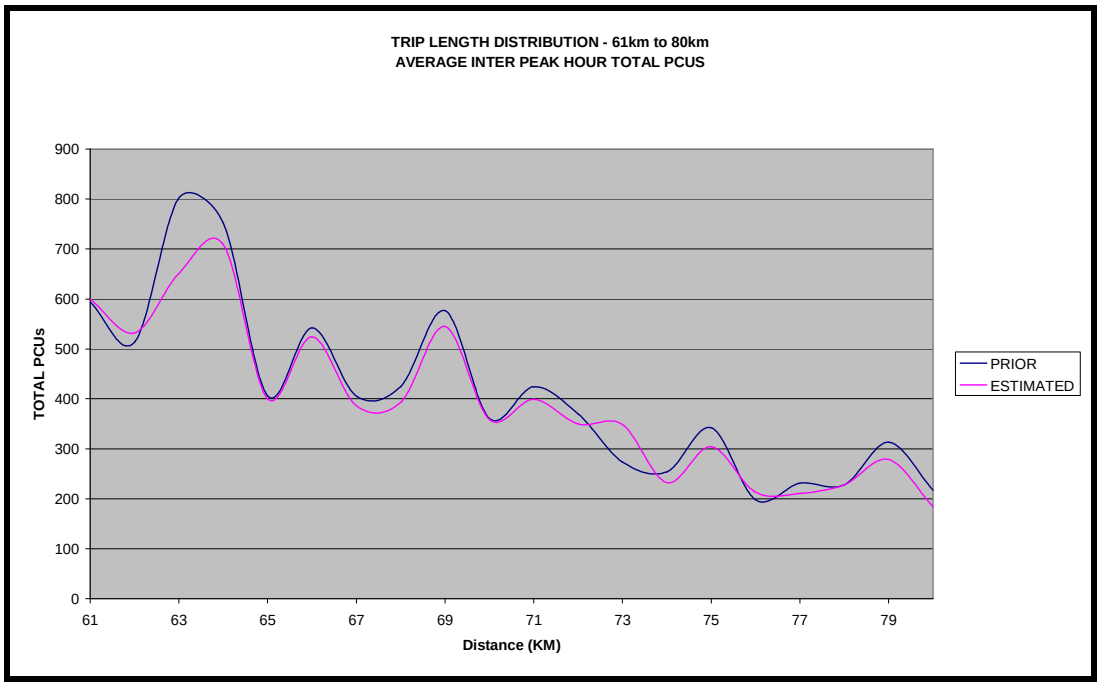
Average Inter Peak Hour Trip Length Distribution – 0km to 20km



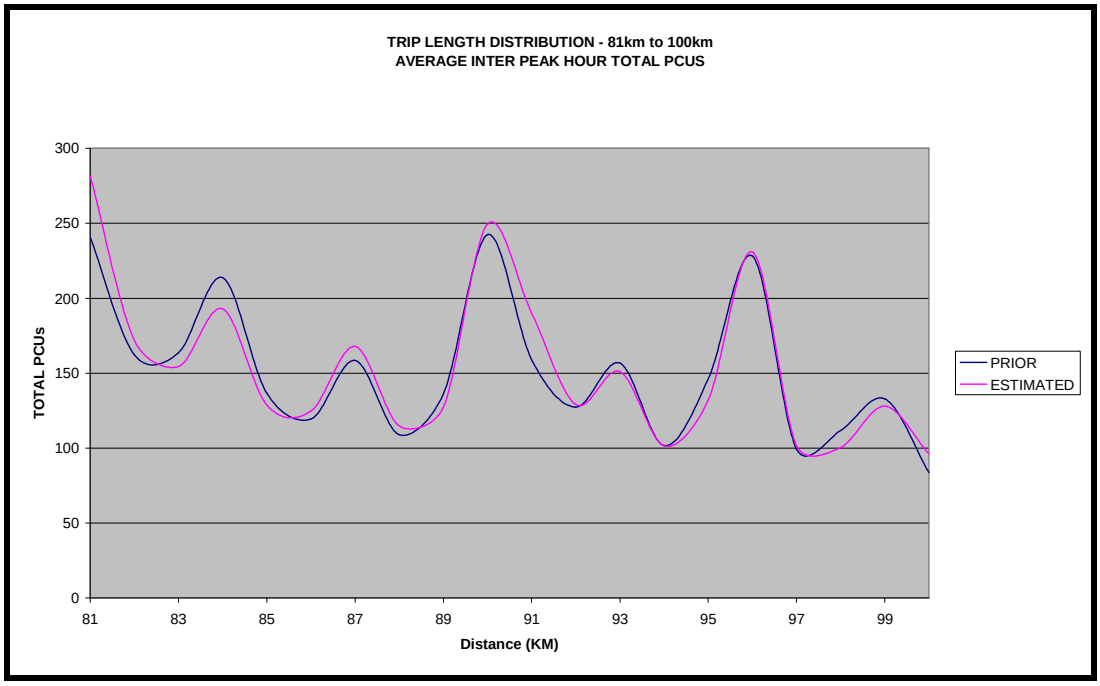
Average Inter Peak Hour Trip Length Distribution – 21km to 40km



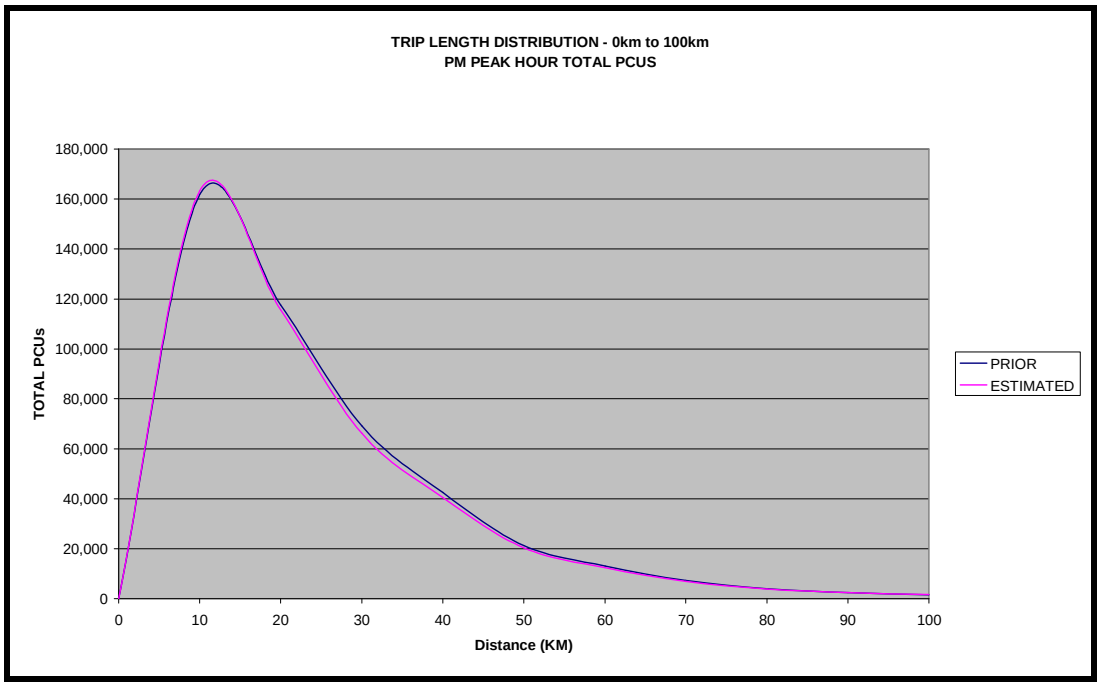
Average Inter Peak Hour Trip Length Distribution – 41km to 60km



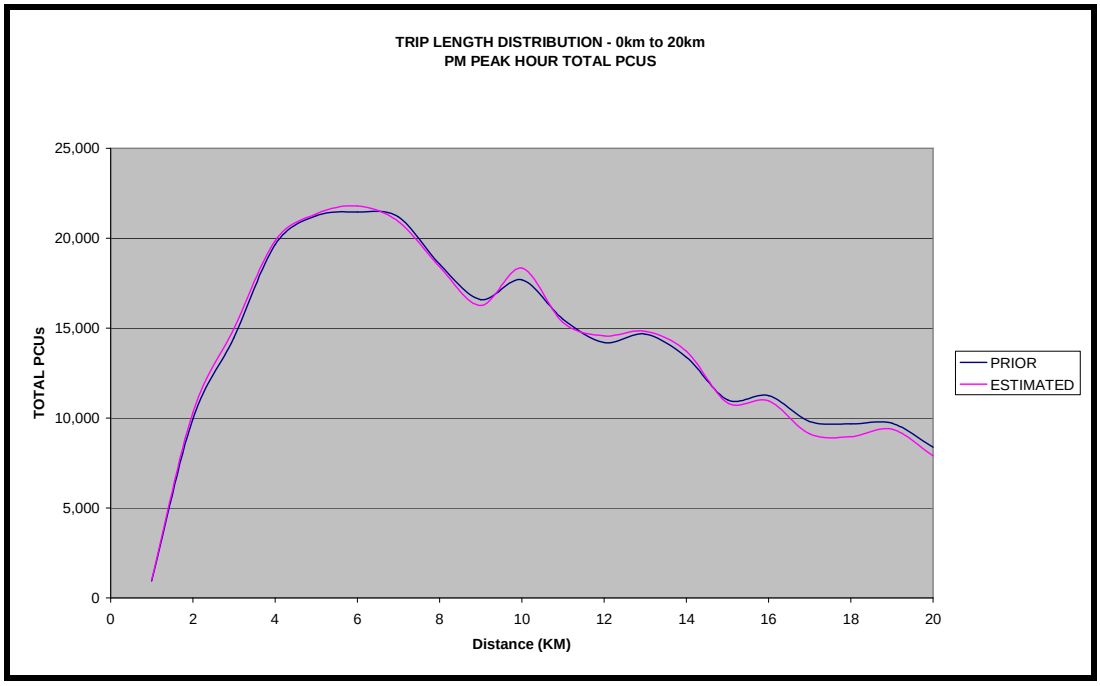
Average Inter Peak Hour Trip Length Distribution – 61km to 80km



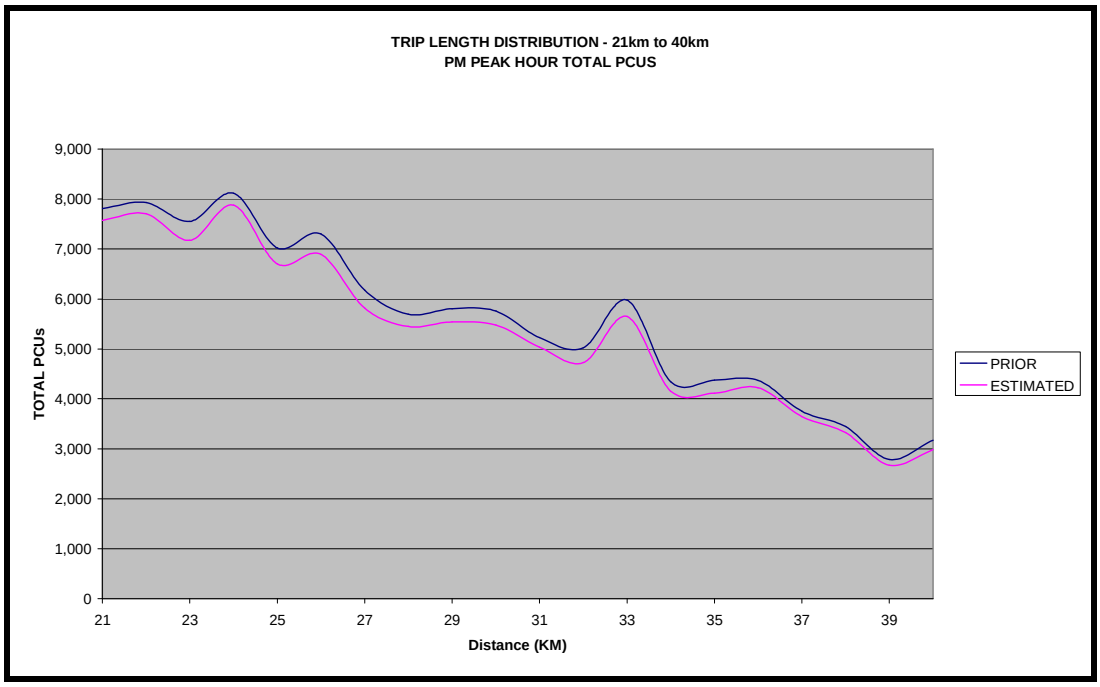
Average Inter Peak Hour Trip Length Distribution – 81km to 100km



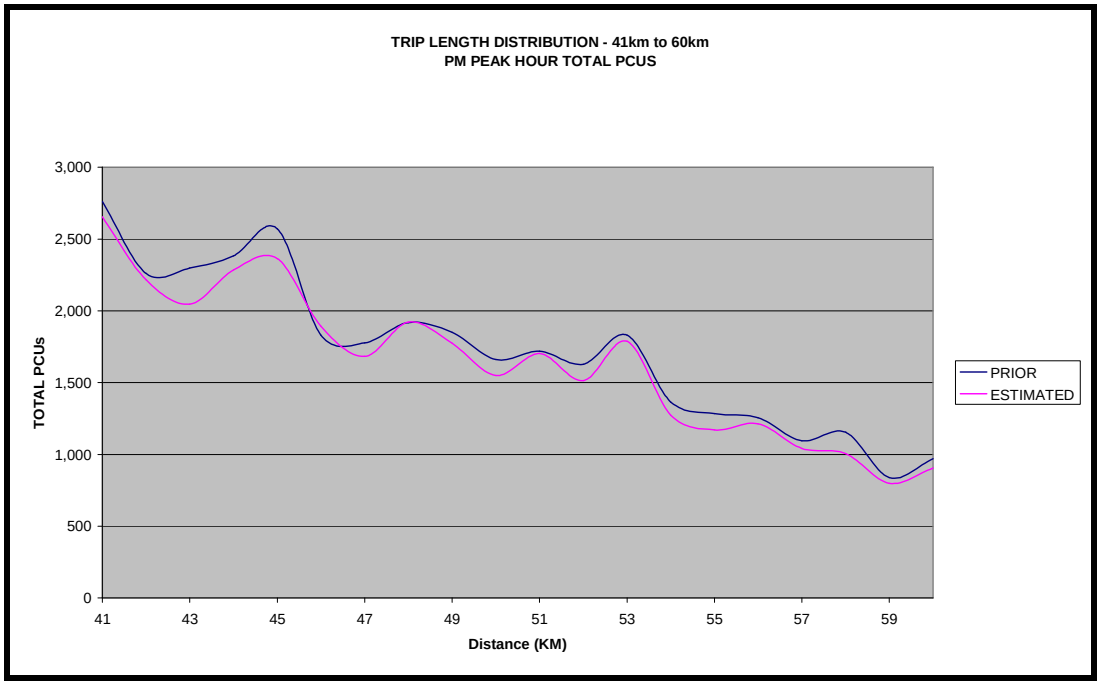
PM Peak Hour Trip Length Distribution – 0km to 100km



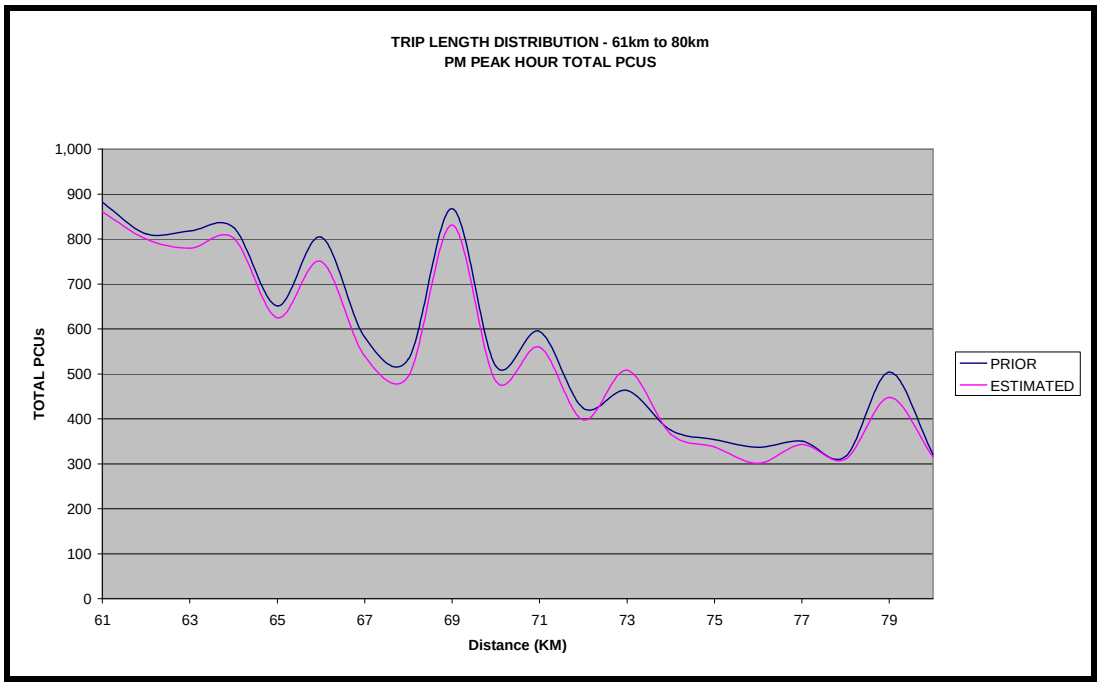
PM Peak Hour Trip Length Distribution – 0km to 20km



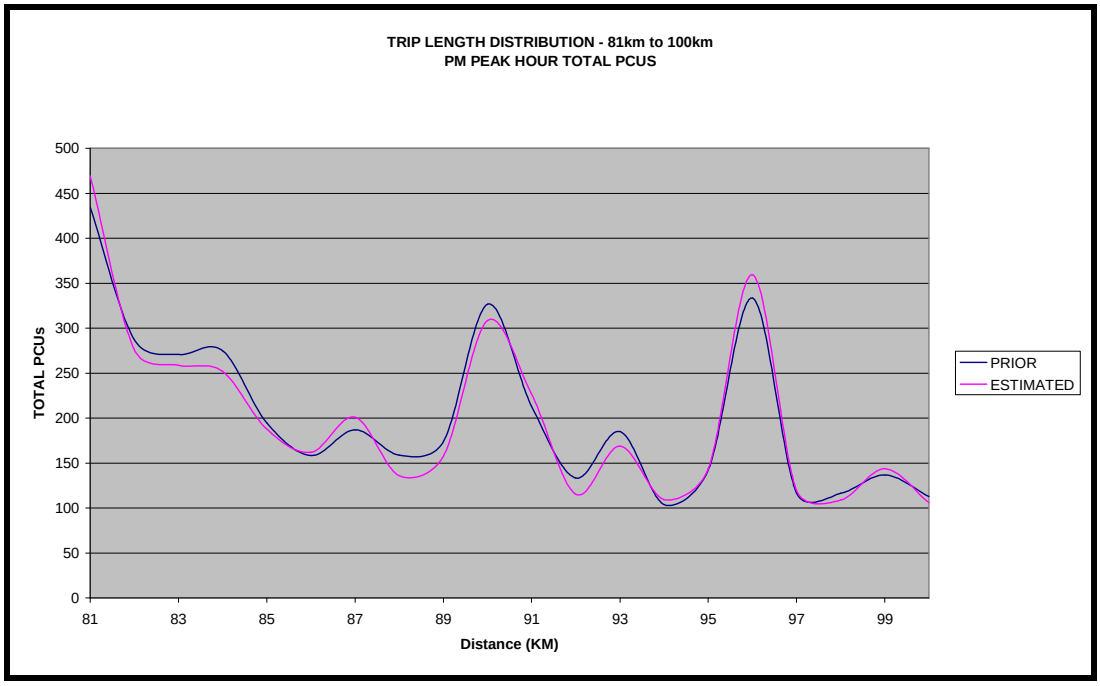
PM Peak Hour Trip Length Distribution – 21km to 40km



PM Peak Hour Trip Length Distribution – 41km to 60km



PM Peak Hour Trip Length Distribution – 61km to 80km



PM Peak Hour Trip Length Distribution – 81km to 100km

Appendix F – Link Count Calibration Analysis

AM Peak Hour Link Count Validation

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
1	46340	46338	A96	ABERDEEN	NB	516	581	13%	**2.8**
1	46364	46365	A947	ABERDEEN	NB	600	1,157	93%	**18.8**
1	47570	47582	B997	ABERDEEN	NB	192	308	60%	**7.3**
1	44153	44155	A90	ABERDEEN	NB	440	386	-12%	**2.7**
1	47573	47576	B999	ABERDEEN	NB	82	46	-44%	**4.5**
101	46365	46364	A947	ABERDEEN	SB	514	674	31%	**6.6**
101	47582	47570	B997	ABERDEEN	SB	177	283	60%	**7.0**
101	47576	47573	B999	ABERDEEN	SB	491	333	-32%	**7.8**
101	46339	46341	A96	ABERDEEN	SB	1,382	1,474	7%	**2.4**
101	44156	44154	A90	ABERDEEN	SB	1,036	1,029	-1%	**0.2**
2	46310	46251	A944	ABERDEEN	EB	700	874	25%	**6.2**
2	46304	46245	B9119	ABERDEEN	EB	960	628	-35%	**11.8**
2	46458	46459	A93	ABERDEEN	EB	624	900	44%	**10.0**
2	43805	43808	B9077	ABERDEEN	EB	126	110	-12%	**1.4**
201	43808	43805	B9077	ABERDEEN	WB	345	290	-16%	**3.1**
201	46251	46310	A944	ABERDEEN	WB	324	409	26%	**4.5**
201	46245	46304	B9119	ABERDEEN	WB	822	572	-30%	**9.5**
201	46459	46458	A93	ABERDEEN	WB	322	601	87%	**13.0**
3	46029	46030	A90	ABERDEEN	NB	2,613	2,526	-3%	**1.7**
301	46012	46010	A90	ABERDEEN	SB	779	828	6%	**1.7**
8	8578	8564	A90	EDINBURGH	SB	2,186	2,366	8%	**3.8**
8	8334	8335	A71	EDINBURGH	EB	1,798	1,697	-6%	**2.4**
8	8260	8274	A70	EDINBURGH	EB	1,015	897	-12%	**3.8**
8	8527	8301	A8	EDINBURGH	EB	2,661	2,530	-5%	**2.6**
8	8429	8437	M8	EDINBURGH	EB	3,271	3,547	8%	**4.7**
801	8581	8579	A90	EDINBURGH	NB	1,440	1,761	22%	**8.0**
801	8335	8334	A71	EDINBURGH	WB	1,478	1,555	5%	**2.0**
801	8274	8260	A70	EDINBURGH	WB	606	469	-23%	**5.9**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
801	8528	8367	A8	EDINBURGH	WB	2,167	2,385	10%	**4.6**
801	8422	8428	M8	EDINBURGH	WB	1,845	1,929	5%	**1.9**
9	8659	8668	A702	EDINBURGH	SB	759	856	13%	**3.4**
9	7676	7784	Old Dalkeith Road	EDINBURGH	EB	720	638	-11%	**3.2**
9	7360	7375	A701	EDINBURGH	SB	837	874	4%	**1.3**
9	7364	7363	B702	EDINBURGH	SB	321	9	-97%	**24.2**
9	7668	7688	A7	EDINBURGH	SB	688	720	5%	**1.2**
9	7748	7750	B6392	EDINBURGH	SB	225	244	8%	**1.2**
9	5867	5866	A6094	EDINBURGH	SB	261	266	2%	**0.3**
9	6029	6012	A6124	EDINBURGH	SB	101	105	4%	**0.4**
9	9362	7357	Lasswade Road	EDINBURGH	SB	401	307	-24%	**5.0**
901	8668	8659	A702	EDINBURGH	NB	1,161	1,325	14%	**4.7**
901	7377	7359	A701	EDINBURGH	NB	1,153	1,028	-11%	**3.8**
901	7784	7676	Old Dalkeith Road	EDINBURGH	WB	770	805	4%	**1.2**
901	7363	7364	B702	EDINBURGH	NB	427	9	-98%	**28.3**
901	7688	7668	A7	EDINBURGH	NB	873	1,136	30%	**8.3**
901	7750	7748	B6392	EDINBURGH	NB	450	282	-37%	**8.8**
901	5866	5867	A6094	EDINBURGH	NB	322	316	-2%	**0.4**
901	6012	6029	A6124	EDINBURGH	NB	261	310	19%	**2.9**
901	7357	9362	Lasswade Road	EDINBURGH	NB	798	632	-21%	**6.2**
10	6037	6038	A1	EDINBURGH	EB	1,478	1,253	-15%	**6.1**
10	6035	6036	A199	EDINBURGH	EB	261	360	38%	**5.6**
10	6077	6076	B1361	EDINBURGH	EB	221	170	-23%	**3.6**
10	6146	6147	B1348	EDINBURGH	EB	120	166	38%	**3.8**
1001	6034	6033	A1	EDINBURGH	WB	2,010	1,913	-5%	**2.2**
1001	6036	6035	A199	EDINBURGH	WB	374	360	-4%	**0.7**
1001	6076	6077	B1361	EDINBURGH	WB	412	322	-22%	**4.7**
1001	6147	6146	B1348	EDINBURGH	WB	105	264	151%	**11.7**
11	9272	9271	A720	EDINBURGH	EB	2,934	3,128	7%	**3.5**
11	9274	9275	B701	EDINBURGH	EB	252	272	8%	**1.2**
1101	9287	9270	A720	EDINBURGH	WB	3,054	3,543	16%	**8.5**
1101	9275	9274	B701	EDINBURGH	WB	454	445	-2%	**0.4**
12	31705	31753	A91	EDINBURGH	NB	825	750	-9%	**2.7**
12	8166	8167	Forth Road Bridge	EDINBURGH	NB	2,886	2,951	2%	**1.2**
12	27020	27021	A876 Kincardine Bridge	EDINBURGH	NB	1,258	1,337	6%	**2.2**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
12	31724	31725	A9	EDINBURGH	NB	555	626	13%	**2.9**
12	31425	31426	Cornton Road	EDINBURGH	NB	200	248	24%	**3.2**
1201	31753	31705	A91	EDINBURGH	SB	1,333	1,121	-16%	**6.1**
1201	8169	8168	Forth Road Bridge	EDINBURGH	SB	3,450	3,478	1%	**0.5**
1201	27021	27020	A876 Kincardine Bridge	EDINBURGH	SB	1,345	1,453	8%	**2.9**
1201	31725	31724	A9	EDINBURGH	SB	675	914	35%	**8.5**
1201	31426	31425	Cornton Road	EDINBURGH	SB	236	291	23%	**3.4**
13	34045	34035	A907	EDINBURGH	EB	492	454	-8%	**1.7**
13	33928	33944	A985	EDINBURGH	EB	710	776	9%	**2.4**
13	34194	34192	A823	EDINBURGH	SB	245	274	12%	**1.8**
1301	34035	34045	A907	EDINBURGH	WB	281	290	3%	**0.5**
1301	33944	33928	A985	EDINBURGH	WB	736	766	4%	**1.1**
1301	34192	34194	A823	EDINBURGH	NB	155	153	-1%	**0.2**
14	35074	35076	B925	EDINBURGH	EB	58	152	161%	**9.1**
14	35182	35223	B9157	EDINBURGH	EB	205	153	-25%	**3.9**
14	35191	35202	A921	EDINBURGH	NB	431	394	-8%	**1.8**
14	34679	34721	M90	EDINBURGH	NB	1,178	1,023	-13%	**4.7**
14	34852	34894	A92	EDINBURGH	NB	1,941	2,129	10%	**4.2**
14	38468	38450	B996	EDINBURGH	NB	172	178	4%	**0.5**
14	34911	34912	B981	EDINBURGH	EB	376	291	-22%	**4.6**
1401	35076	35074	B925	EDINBURGH	WB	63	162	158%	**9.4**
1401	35223	35182	B9157	EDINBURGH	WB	241	163	-32%	**5.5**
1401	35202	35191	A921	EDINBURGH	SB	230	229	0%	**0.0**
1401	34722	34678	M90	EDINBURGH	SB	1,171	1,145	-2%	**0.8**
1401	34893	34851	A92	EDINBURGH	SB	2,197	2,350	7%	**3.2**
1401	38450	38468	B996	EDINBURGH	SB	130	158	22%	**2.3**
1401	34912	34911	B981	EDINBURGH	WB	451	341	-24%	**5.5**
15	21578	21579	A81	GLASGOW	NB	591	552	-7%	**1.6**
15	22258	22261	A803	GLASGOW	NB	896	944	5%	**1.6**
15	21545	21717	A879	GLASGOW	NB	468	436	-7%	**1.5**
15	57963	57961	Maryhill Road (A81)	GLASGOW	NB	424	586	38%	**7.2**
1501	21579	21578	A81	GLASGOW	SB	804	816	1%	**0.4**
1501	21717	21545	A879	GLASGOW	SB	804	972	21%	**5.6**
1501	22277	22260	A803	GLASGOW	SB	1,535	1,616	5%	**2.1**
1501	57961	57963	Maryhill Road (A81)	GLASGOW	SB	587	865	47%	**10.3**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
16	57138	57137	Argyle Street	GLASGOW	EB	244	562	130%	**15.9**
16	21550	21549	A82	GLASGOW	EB	1,348	1,934	43%	**14.5**
16	21219	21300	A814	GLASGOW	EB	2,942	2,052	-30%	**17.8**
1601	57137	57138	Argyle Street	GLASGOW	WB	648	749	16%	**3.8**
1601	21549	21550	A82	GLASGOW	WB	558	1,448	160%	**28.1**
1601	21305	21218	A814	GLASGOW	WB	1,747	1,380	-21%	**9.3**
17	22771	22323	Cumbernauld Road	GLASGOW	WB	311	571	84%	**12.4**
17	22882	22423	M80	GLASGOW	WB	2,995	2,685	-10%	**5.8**
1701	22323	22771	Cumbernauld Road	GLASGOW	EB	538	523	-3%	**0.7**
1701	22422	22883	M80	GLASGOW	EB	2,017	1,899	-6%	**2.7**
18	22200	22679	A8	GLASGOW	EB	178	274	54%	**6.4**
18	21991	21980	A89	GLASGOW	EB	205	425	108%	**12.4**
18	22249	22252	M8	GLASGOW	EB	4,647	4,386	-6%	**3.9**
18	22241	22363	B765	GLASGOW	EB	209	43	-79%	**14.8**
1801	22680	22183	A8	GLASGOW	WB	419	328	-22%	**4.7**
1801	22363	22241	B765	GLASGOW	WB	137	111	-19%	**2.3**
1801	22251	22246	M8	GLASGOW	WB	4,269	4,773	12%	**7.5**
19	12380	12403	A724	GLASGOW	EB	436	642	47%	**8.9**
19	12133	12132	A749	GLASGOW	SB	1,155	1,006	-13%	**4.5**
19	22460	22507	M74	GLASGOW	EB	1,755	1,863	6%	**2.5**
19	12424	12402	B759	GLASGOW	SB	421	529	26%	**5.0**
1901	12403	12380	A724	GLASGOW	WB	587	762	30%	**6.7**
1901	12145	12144	A749	GLASGOW	NB	1,197	1,295	8%	**2.8**
1901	22506	22459	M74	GLASGOW	WB	2,842	2,740	-4%	**1.9**
1901	12402	12424	B759	GLASGOW	NB	560	626	12%	**2.7**
20	19807	19808	A736	GLASGOW	NB	927	1,106	19%	**5.6**
20	57414	57408	Peat Road	GLASGOW	NB	470	388	-17%	**4.0**
20	19788	19803	M77	GLASGOW	NB	3,454	3,291	-5%	**2.8**
20	19452	19453	B769	GLASGOW	NB	724	570	-21%	**6.0**
20	19579	19580	A77	GLASGOW	NB	785	870	11%	**3.0**
20	20422	20450	B766	GLASGOW	NB	1,053	937	-11%	**3.7**
20	19691	19689	B767	GLASGOW	NB	715	551	-23%	**6.5**
2001	19810	19809	A736	GLASGOW	SB	700	855	22%	**5.6**
2001	57409	57413	Peat Road	GLASGOW	SB	250	256	2%	**0.4**
2001	19804	19785	M77	GLASGOW	SB	2,040	2,327	14%	**6.1**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
2001	19453	19452	B769	GLASGOW	SB	372	326	-12%	2.5
2001	19580	19579	A77	GLASGOW	SB	457	474	4%	0.8
2001	20446	20449	B766	GLASGOW	SB	498	562	13%	2.8
2001	19689	19691	B767	GLASGOW	SB	571	521	-9%	2.1
21	28977	28979	A761	GLASGOW	EB	382	699	83%	13.6
21	28779	29037	M8	GLASGOW	EB	5,191	4,779	-8%	5.8
2101	28979	28977	A761	GLASGOW	WB	681	621	-9%	2.4
2101	29038	28788	M8	GLASGOW	WB	4,112	3,972	-3%	2.2
22	28884	29970	A898 Erskine Bridge	GLASGOW	NB	1,551	1,572	1%	0.5
22	20958	20959	A77	GLASGOW	NB	1,994	1,171	-41%	20.7
22	20972	20976	A8	GLASGOW	NB	854	1,181	38%	10.3
22	20936	20937	A8	GLASGOW	NB	496	1,076	117%	20.7
22	20281	20386	A739	GLASGOW	NB	2,887	2,415	-16%	9.2
22	21113	21100	M8 Kingston Bridge	GLASGOW	NB	5,351	5,632	5%	3.8
22	21110	21318	M8 Kingston Bridge	GLASGOW	NB	2,706	2,373	-12%	6.6
2201	29971	28885	A898 Erskine Bridge	GLASGOW	SB	1,664	1,662	0%	0.1
2201	20937	20936	A8	GLASGOW	SB	869	812	-7%	2.0
2201	20385	20346	A739	GLASGOW	SB	2,450	2,180	-11%	5.6
2201	21101	21106	M8 Kingston Bridge	GLASGOW	SB	6,247	6,256	0%	0.1
2201	20961	20960	A77	GLASGOW	SB	677	945	40%	9.4
23	21496	56351	M8	GLASGOW	EB	5,479	5,289	-3%	2.6
2301	21497	56359	M8	GLASGOW	WB	5,791	6,357	10%	7.3
25	25564	25568	A803	CENTRAL & TAYSIDE	EB	745	670	-10%	2.8
25	25106	25107	A80	CENTRAL & TAYSIDE	NB	3,177	2,940	-7%	4.3
25	25140	25141	B816	CENTRAL & TAYSIDE	NB	955	1,032	8%	2.5
2501	25568	25564	A803	CENTRAL & TAYSIDE	WB	365	443	21%	3.9
2501	25139	25108	A80	CENTRAL & TAYSIDE	SB	2,824	3,007	6%	3.4
2501	25143	25142	B816	CENTRAL & TAYSIDE	SB	587	566	-4%	0.9
27	36869	36870	A85	CENTRAL & TAYSIDE	EB	417	506	21%	4.1
27	36957	36956	A9 (North of Perth)	CENTRAL & TAYSIDE	SB	1,056	946	-10%	3.5
27	36809	36822	A9 (South of Perth)	CENTRAL & TAYSIDE	NB	968	844	-13%	4.1
2701	36870	36869	A85	CENTRAL & TAYSIDE	WB	433	489	13%	2.6
2701	36954	36955	A9 (North of Perth)	CENTRAL & TAYSIDE	NB	770	711	-8%	2.2
2701	36653	36811	A9 (South of Perth)	CENTRAL & TAYSIDE	SB	1,286	1,160	-10%	3.6
28	33349	38768	A92 Tay Bridge	CENTRAL & TAYSIDE	NB	1,991	2,220	11%	5.0

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
28	37406	37322	M90	CENTRAL & TAYSIDE	NB	1,697	1,397	-18%	**7.6**
2801	38853	33350	A92 Tay Bridge	CENTRAL & TAYSIDE	SB	730	885	21%	**5.5**
2801	37324	37405	M90	CENTRAL & TAYSIDE	SB	1,344	1,164	-13%	**5.1**
29	3136	3326	A709	SOUTH	EB	312	375	20%	**3.4**
29	3351	3327	A75	SOUTH	EB	575	518	-10%	**2.4**
29	2806	2817	A75	SOUTH	WB	357	403	13%	**2.4**
29	3232	3291	A76	SOUTH	NB	471	577	22%	**4.6**
29	3242	3285	A701	SOUTH	NB	832	701	-16%	**4.7**
2901	3326	3136	A709	SOUTH	WB	523	499	-5%	**1.1**
2901	3327	3351	A75	SOUTH	WB	367	482	31%	**5.6**
2901	2817	2806	A75	SOUTH	EB	438	447	2%	**0.4**
2901	3291	3232	A76	SOUTH	SB	600	761	27%	**6.2**
2901	3285	3242	A701	SOUTH	SB	1,013	881	-13%	**4.3**
30	14278	14281	A74 (M)	SOUTH	NB	1,081	943	-13%	**4.3**
3001	14280	14277	A74 (M)	SOUTH	SB	1,005	868	-14%	**4.5**
31	4572	4564	A7	SOUTH	SB	207	211	2%	**0.3**
31	5050	5037	A68	SOUTH	SB	178	183	3%	**0.3**
31	7063	7068	A1	SOUTH	SB	433	342	-21%	**4.6**
3101	4564	4572	A7	SOUTH	NB	301	350	16%	**2.7**
3101	5037	5050	A68	SOUTH	NB	301	318	6%	**1.0**
3101	7067	7066	A1	SOUTH	NB	448	418	-7%	**1.5**
32	52556	52540	A82	HIGHLAND	NB	77	85	10%	**0.9**
32	54279	54280	A9	HIGHLAND	NB	315	356	13%	**2.3**
3201	52540	52556	A82	HIGHLAND	SB	82	107	31%	**2.6**
3201	54280	54279	A9	HIGHLAND	SB	266	272	2%	**0.4**
33	49566	49563	A83	WEST	EB	125	92	-26%	**3.2**
33	49583	49584	A85	WEST	EB	60	71	18%	**1.4**
3301	49563	49566	A83	WEST	WB	141	113	-20%	**2.5**
3301	49584	49583	A85	WEST	WB	68	70	3%	**0.2**
34	29847	29857	A82	WEST	EB	2,138	2,066	-3%	**1.6**
3401	29856	29846	A82	WEST	WB	1,846	1,690	-8%	**3.7**
35	4151	4152	A701	SOUTH	NB	140	202	44%	**4.7**
35	14486	14487	A70	SOUTH	NB	207	191	-8%	**1.1**
35	14525	14526	A702	SOUTH	NB	250	223	-11%	**1.8**
3501	4152	4151	A701	SOUTH	SB	95	155	63%	**5.3**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
3501	14487	14486	A70	SOUTH	SB	68	55	-19%	**1.7**
3501	14526	14525	A702	SOUTH	SB	144	176	22%	**2.5**
36	48243	48189	A96, B9103/ Road to Elginhill	HIGHLAND	EB	459	478	4%	**0.9**
36	48227	48059	A941, Thornhill Road	HIGHLAND	SB	176	143	-19%	**2.6**
3601	48189	48243	A96, B9103 Road to Elginhill	HIGHLAND	WB	803	870	8%	**2.3**
3601	48059	48227	A941, Thornhill Road	HIGHLAND	NB	271	261	-4%	**0.6**
37	47942	47943	A916, Elgin Limits/Derelict B	HIGHLAND	EB	524	645	23%	**5.0**
37	48249	48248	A941, Spynie Place/Myreside	HIGHLAND	SB	341	331	-3%	**0.6**
3701	48248	48249	A941, Spynie Place/Myreside	HIGHLAND	NB	279	222	-20%	**3.6**
3701	47943	47942	A916, Elgin Limits/Derelict B	HIGHLAND	WB	613	585	-5%	**1.1**
38	52950	52951	A862, Beauly	HIGHLAND	NB	242	226	-7%	**1.1**
38	53783	53717	A9, North of Inverness	HIGHLAND	NB	879	855	-3%	**0.8**
3801	52951	52950	A862, Beauly	HIGHLAND	SB	252	210	-17%	**2.8**
3801	53718	53782	A9, North of Inverness	HIGHLAND	SB	1,534	1,587	3%	**1.3**
39	53791	53794	A96, Outside Inverness	HIGHLAND	EB	538	510	-5%	**1.2**
39	54103	54097	Tomatin A9	HIGHLAND	SB	376	322	-14%	**2.9**
3901	53794	53793	A96, Outside Inverness	HIGHLAND	WB	606	656	8%	**2.0**
3901	54097	54103	Tomatin A9	HIGHLAND	NB	450	568	26%	**5.2**
40	32013	31920	A908, Alloa Road	CENTRAL & TAYSIDE	SB	301	270	-10%	**1.8**
40	32124	32168	A907, Clackmannan Road	CENTRAL & TAYSIDE	WB	709	694	-2%	**0.6**
40	32022	32021	A91, West Stirling Road	CENTRAL & TAYSIDE	WB	411	472	15%	**2.9**
40	32080	32108	Collyland Road	CENTRAL & TAYSIDE	WB	265	267	1%	**0.1**
40	32102	32095	B908	CENTRAL & TAYSIDE	SB	163	196	21%	**2.5**
4001	32021	32022	A91, West Stirling Road	CENTRAL & TAYSIDE	EB	217	206	-5%	**0.7**
4001	31920	32013	A908, Alloa Road	CENTRAL & TAYSIDE	NB	258	213	-18%	**3.0**
4001	32168	32124	A907, Clackmannan Road	CENTRAL & TAYSIDE	EB	472	601	27%	**5.6**
4001	32108	32080	Collyland Road	CENTRAL & TAYSIDE	EB	196	151	-23%	**3.4**
4001	32095	32102	B908	CENTRAL & TAYSIDE	NB	120	168	41%	**4.1**
41	11060	11076	Livingston, A71	CENTRAL & TAYSIDE	EB	504	790	57%	**11.3**
41	11092	11096	Livingston, A705	CENTRAL & TAYSIDE	EB	591	476	-20%	**5.0**
41	10593	11125	M8	CENTRAL & TAYSIDE	EB	3,206	3,075	-4%	**2.4**
4101	11096	11092	Livingston, A705	CENTRAL & TAYSIDE	WB	246	193	-22%	**3.6**
4101	11076	11060	Livingston, A71	CENTRAL & TAYSIDE	WB	796	700	-12%	**3.5**
4101	10794	10591	M8	CENTRAL & TAYSIDE	WB	2,133	2,091	-2%	**0.9**
42	18798	18771	A736, Cairnmount Road	SOUTH	SB	258	278	8%	**1.2**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
42	18445	18453	A78, S of Meadowhead Avenue	SOUTH	NB	998	1,266	27%	8.0
42	19075	19074	Old Stewart Road	SOUTH	WB	103	173	68%	6.0
42	19046	19045	B7081, Main Road, Near Springside	SOUTH	WB	246	239	-3%	0.5
42	18799	18773	A737	SOUTH	SB	715	719	1%	0.1
42	18839	18844	B7080	SOUTH	SB	1,329	906	-32%	12.7
42	18538	18539	A78	SOUTH	NB	1,454	1,246	-14%	5.7
42	19024	18532	A71	SOUTH	WB	1,144	1,480	29%	9.3
4201	19045	19046	B7081, Main Road, Near Springside	SOUTH	EB	284	251	-12%	2.0
4201	18773	18799	A737	SOUTH	NB	495	500	1%	0.2
4201	18771	18798	A736, Cairnmount Road	SOUTH	NB	343	297	-13%	2.6
4201	18454	18446	A78, S of Meadowhead Av	SOUTH	SB	1,033	1,010	-2%	0.7
4201	18541	18540	A78	SOUTH	SB	1,678	1,571	-6%	2.7
4201	18533	19026	A71	SOUTH	EB	1,162	1,516	30%	9.7
4201	18844	18839	B7080	SOUTH	NB	1,131	789	-30%	11.0
43	14960	14959	B7081, Irvine Road	SOUTH	WB	545	405	-26%	6.5
43	14726	14621	A71, West of Kilmarnock	SOUTH	WB	1,688	1,455	-14%	5.9
43	15220	15598	A77, North of B7038 Kilmarnock	SOUTH	NB	1,288	1,675	30%	10.1
43	15119	15151	A735, Kilmaurs Road	SOUTH	NB	220	254	16%	2.2
4301	15151	15119	A735, Kilmaurs Road	SOUTH	SB	396	535	35%	6.4
4301	14959	14960	B7081, Irvine Road	SOUTH	EB	436	226	-48%	11.5
4301	14620	14724	A71, West of Kilmarnock	SOUTH	EB	1,583	1,406	-11%	4.6
4301	15602	15218	A77, N of B7038 Kilmarnock	SOUTH	SB	1,295	1,291	0%	0.1
4301	15244	15196	B7038	SOUTH	SB	666	392	-41%	11.9
44	55494	55488	A74	SOUTH	NB	1,193	1,029	-14%	4.9
4401	55488	55494	A74	SOUTH	SB	1,187	979	-18%	6.3
45	3992	3988	A7	SOUTH	NB	141	182	29%	3.3
4501	3988	3992	A7	SOUTH	SB	180	158	-12%	1.7
46	5266	5265	A6088	SOUTH	NB	49	36	-26%	1.9
4601	5265	5266	A6088	SOUTH	SB	51	38	-25%	1.9
47	5266	5268	A68	SOUTH	NB	83	53	-36%	3.6
4701	5268	5266	A68	SOUTH	SB	62	52	-16%	1.3
48	5679	5686	A698	SOUTH	EB	166	164	-1%	0.1
4801	5686	5679	A698	SOUTH	WB	148	162	10%	1.1
49	5847	5849	A1	SOUTH	NB	304	318	4%	0.8
4901	5849	5847	A1	SOUTH	SB	316	343	9%	1.5

Average Inter Peak Hour Link Count Validation

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
1	46340	46338	A96	ABERDEEN	NB	634	593	-7%	**1.7**
1	46364	46365	A947	ABERDEEN	NB	550	658	20%	**4.4**
1	47570	47582	B997	ABERDEEN	NB	156	178	14%	**1.7**
1	44153	44155	A90	ABERDEEN	NB	553	524	-5%	**1.3**
1	47573	47576	B999	ABERDEEN	NB	171	89	-48%	**7.2**
101	46365	46364	A947	ABERDEEN	SB	526	680	29%	**6.3**
101	47582	47570	B997	ABERDEEN	SB	156	172	10%	**1.2**
101	47576	47573	B999	ABERDEEN	SB	143	97	-32%	**4.2**
101	46339	46341	A96	ABERDEEN	SB	702	638	-9%	**2.5**
101	44156	44154	A90	ABERDEEN	SB	518	492	-5%	**1.2**
2	46310	46251	A944	ABERDEEN	EB	230	349	52%	**7.0**
2	46304	46245	B9119	ABERDEEN	EB	543	379	-30%	**7.6**
2	46458	46459	A93	ABERDEEN	EB	284	425	50%	**7.5**
2	43805	43808	B9077	ABERDEEN	WB	182	152	-16%	**2.3**
201	43808	43805	B9077	ABERDEEN	EB	159	132	-17%	**2.3**
201	46251	46310	A944	ABERDEEN	WB	295	365	24%	**3.9**
201	46245	46304	B9119	ABERDEEN	WB	539	396	-27%	**6.6**
201	46459	46458	A93	ABERDEEN	WB	292	444	52%	**7.9**
3	46029	46030	A90	ABERDEEN	NB	1,271	1,212	-5%	**1.7**
301	46012	46010	A90	ABERDEEN	SB	1187	1234	4%	**1.4**
8	8578	8564	A90	EDINBURGH	SB	1,151	1,254	9%	**3.0**
8	8334	8335	A71	EDINBURGH	EB	1,180	1,275	8%	**2.7**
8	8260	8274	A70	EDINBURGH	EB	523	396	-24%	**5.9**
8	8527	8301	A8	EDINBURGH	EB	1,445	1,356	-6%	**2.4**
8	8429	8437	M8	EDINBURGH	EB	1,878	1,834	-2%	**1.0**
801	8581	8579	A90	EDINBURGH	NB	1,230	1,423	16%	**5.3**
801	8335	8334	A71	EDINBURGH	WB	1,250	1,526	22%	**7.4**
801	8274	8260	A70	EDINBURGH	WB	546	374	-32%	**8.0**
801	8528	8367	A8	EDINBURGH	WB	1,821	1,904	5%	**1.9**
801	8422	8428	M8	EDINBURGH	WB	1,658	1,598	-4%	**1.5**
9	8659	8668	A702	EDINBURGH	SB	649	730	13%	**3.1**
9	7676	7784	Old Dalkeith Road	EDINBURGH	EB	485	601	24%	**5.0**
9	7360	7375	A701	EDINBURGH	SB	713	733	3%	**0.7**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
9	7364	7363	B702	EDINBURGH	SB	430	9	-98%	**28.4**
9	7668	7688	A7	EDINBURGH	SB	454	623	37%	**7.3**
9	7748	7750	B6392	EDINBURGH	SB	200	142	-29%	**4.5**
9	5867	5866	A6094	EDINBURGH	SB	165	157	-5%	**0.6**
9	6029	6012	A6124	EDINBURGH	SB	80	105	32%	**2.6**
9	9362	7357	Lasswade Road	EDINBURGH	SB	366	384	5%	**0.9**
901	8668	8659	A702	EDINBURGH	NB	486	604	24%	**5.1**
901	7377	7359	A701	EDINBURGH	NB	564	668	18%	**4.2**
901	7784	7676	Old Dalkeith Road	EDINBURGH	WB	511	681	33%	**7.0**
901	7363	7364	B702	EDINBURGH	NB	399	9	-98%	**27.3**
901	7688	7668	A7	EDINBURGH	NB	545	653	20%	**4.4**
901	7750	7748	B6392	EDINBURGH	NB	187	128	-32%	**4.7**
901	5866	5867	A6094	EDINBURGH	NB	184	168	-9%	**1.2**
901	6012	6029	A6124	EDINBURGH	NB	91	115	27%	**2.4**
901	7357	9362	Lasswade Road	EDINBURGH	NB	302	378	25%	**4.1**
10	6037	6038	A1	EDINBURGH	EB	1,454	1,239	-15%	**5.9**
10	6035	6036	A199	EDINBURGH	EB	274	328	20%	**3.1**
10	6077	6076	B1361	EDINBURGH	EB	238	194	-19%	**3.0**
10	6146	6147	B1348	EDINBURGH	EB	140	227	62%	**6.4**
1001	6034	6033	A1	EDINBURGH	WB	1,324	1,222	-8%	**2.9**
1001	6036	6035	A199	EDINBURGH	WB	242	265	10%	**1.5**
1001	6076	6077	B1361	EDINBURGH	WB	239	202	-15%	**2.5**
1001	6147	6146	B1348	EDINBURGH	WB	135	198	47%	**4.9**
11	9272	9271	A720	EDINBURGH	EB	2,365	2,459	4%	**1.9**
11	9274	9275	B701	EDINBURGH	EB	251	217	-13%	**2.2**
1101	9287	9270	A720	EDINBURGH	WB	2,465	2,474	0%	**0.2**
1101	9275	9274	B701	EDINBURGH	WB	257	234	-9%	**1.5**
12	31705	31753	A91	EDINBURGH	NB	680	673	-1%	**0.3**
12	8166	8167	Forth Road Bridge	EDINBURGH	NB	1,931	2,069	7%	**3.1**
12	27020	27021	A876 - Kincardine Bridge	EDINBURGH	NB	937	961	3%	**0.8**
12	31724	31725	A9	EDINBURGH	NB	529	562	6%	**1.4**
12	31425	31426	Cornton Rd	EDINBURGH	NB	236	217	-8%	**1.2**
1201	31753	31705	A91	EDINBURGH	SB	704	703	0%	**0.0**
1201	8169	8168	Forth Road Bridge	EDINBURGH	SB	2,099	2,070	-1%	**0.6**
1201	27021	27020	A876 - Kincardine Bridge	EDINBURGH	SB	862	939	9%	**2.6**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
1201	31725	31724	A9	EDINBURGH	SB	542	602	11%	**2.5**
1201	31426	31425	Cornton Rd	EDINBURGH	SB	217	220	1%	**0.2**
13	34045	34035	A907	EDINBURGH	EB	263	322	22%	**3.4**
13	33928	33944	A985	EDINBURGH	EB	406	460	13%	**2.6**
13	34194	34192	A823	EDINBURGH	SB	144	132	-9%	**1.1**
1301	34035	34045	A907	EDINBURGH	WB	249	288	16%	**2.4**
1301	33944	33928	A985	EDINBURGH	WB	352	426	21%	**3.7**
1301	34192	34194	A823	EDINBURGH	NB	141	108	-23%	**2.9**
14	35074	35076	B925	EDINBURGH	EB	43	120	179%	**8.5**
14	35182	35223	B9157	EDINBURGH	EB	136	105	-23%	**2.9**
14	35191	35202	A921	EDINBURGH	NB	309	274	-11%	**2.0**
14	34679	34721	M90	EDINBURGH	NB	912	887	-3%	**0.8**
14	34852	34894	A92	EDINBURGH	NB	1,501	1,533	2%	**0.8**
14	38468	38450	B996	EDINBURGH	NB	119	147	24%	**2.5**
14	34911	34912	B981	EDINBURGH	EB	377	282	-25%	**5.2**
1401	35076	35074	B925	EDINBURGH	WB	33	116	250%	**9.6**
1401	35223	35182	B9157	EDINBURGH	WB	140	111	-21%	**2.6**
1401	35202	35191	A921	EDINBURGH	SB	296	256	-14%	**2.4**
1401	34722	34678	M90	EDINBURGH	SB	965	804	-17%	**5.4**
1401	34893	34851	A92	EDINBURGH	SB	1,481	1,501	1%	**0.5**
1401	38450	38468	B996	EDINBURGH	SB	121	139	15%	**1.6**
1401	34912	34911	B981	EDINBURGH	WB	359	273	-24%	**4.9**
15	21578	21579	A81	GLASGOW	NB	560	414	-26%	**6.6**
15	22258	22261	A803	GLASGOW	NB	789	973	23%	**6.2**
15	21545	21717	A879	GLASGOW	NB	572	571	0%	**0.1**
15	57963	57961	Maryhill Rd (A81)	GLASGOW	NB	402	671	67%	**11.6**
1501	21579	21578	A81	GLASGOW	SB	549	487	-11%	**2.7**
1501	21717	21545	A879	GLASGOW	SB	435	550	26%	**5.2**
1501	22277	22260	A803	GLASGOW	SB	803	993	24%	**6.4**
1501	57961	57963	Maryhill Rd (A81)	GLASGOW	SB	409	549	34%	**6.4**
16	57138	57137	Argyle Street	GLASGOW	EB	284	594	109%	**14.8**
16	21550	21549	A82	GLASGOW	EB	696	1,558	124%	**25.7**
16	21219	21300	A814	GLASGOW	EB	1,785	1,178	-34%	**15.8**
1601	57137	57138	Argyle Street	GLASGOW	WB	421	572	36%	**6.8**
1601	21549	21550	A82	GLASGOW	WB	584	1,452	149%	**27.2**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
1601	21305	21218	A814	GLASGOW	WB	1,455	984	-32%	**13.5**
17	22771	22323	Cumbernauld Road	GLASGOW	WB	283	413	46%	**7.0**
17	22882	22423	M80	GLASGOW	WB	1,900	1,771	-7%	**3.0**
1701	22323	22771	Cumbernauld Road	GLASGOW	EB	250	404	62%	**8.5**
1701	22422	22883	M80	GLASGOW	EB	1,891	1,725	-9%	**3.9**
18	22200	22679	A8	GLASGOW	EB	177	224	27%	**3.3**
18	21991	21980	A89	GLASGOW	EB	390	492	26%	**4.8**
18	22249	22252	M8	GLASGOW	EB	4,141	4,050	-2%	**1.4**
18	22241	22363	B765	GLASGOW	EB	143	22	-85%	**13.3**
1801	22680	22183	A8	GLASGOW	WB	175	194	11%	**1.4**
1801	22363	22241	B765	GLASGOW	WB	130	49	-63%	**8.6**
1801	22251	22246	M8	GLASGOW	WB	3,415	3,648	7%	**3.9**
19	12380	12403	A724	GLASGOW	EB	473	561	19%	**3.9**
19	12133	12132	A749	GLASGOW	SB	621	766	23%	**5.5**
19	22460	22507	M74	GLASGOW	EB	1,295	1,645	27%	**9.1**
19	12424	12402	B759	GLASGOW	SB	310	408	32%	**5.2**
1901	12403	12380	A724	GLASGOW	WB	436	553	27%	**5.3**
1901	12145	12144	A749	GLASGOW	NB	708	854	21%	**5.2**
1901	22506	22459	M74	GLASGOW	WB	1,370	1,520	11%	**4.0**
1901	12402	12424	B759	GLASGOW	NB	342	371	9%	**1.5**
20	19807	19808	A736	GLASGOW	NB	600	855	42%	**9.4**
20	57414	57408	Peat Road	GLASGOW	NB	310	314	1%	**0.2**
20	19788	19803	M77	GLASGOW	NB	2,063	1,844	-11%	**5.0**
20	19452	19453	B769	GLASGOW	NB	463	409	-12%	**2.6**
20	19579	19580	A77	GLASGOW	NB	601	559	-7%	**1.8**
20	20422	20450	B766	GLASGOW	NB	446	583	31%	**6.0**
20	19691	19689	B767	GLASGOW	NB	496	435	-12%	**2.8**
2001	19810	19809	A736	GLASGOW	SB	646	794	23%	**5.5**
2001	57409	57413	Peat Road	GLASGOW	SB	305	398	30%	**4.9**
2001	19804	19785	M77	GLASGOW	SB	2,086	2,292	10%	**4.4**
2001	19453	19452	B769	GLASGOW	SB	462	372	-19%	**4.4**
2001	19580	19579	A77	GLASGOW	SB	573	557	-3%	**0.7**
2001	20446	20449	B766	GLASGOW	SB	429	554	29%	**5.7**
2001	19689	19691	B767	GLASGOW	SB	435	397	-9%	**1.9**
21	28977	28979	A761	GLASGOW	EB	374	653	75%	**12.3**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
21	28779	29037	M8	GLASGOW	EB	3,577	3,393	-5%	**3.1**
2101	28979	28977	A761	GLASGOW	WB	441	598	36%	**6.9**
2101	29038	28788	M8	GLASGOW	WB	3,581	3,450	-4%	**2.2**
22	28884	29970	A898 - Erskine Bridge	GLASGOW	NB	1,074	1,105	3%	**0.9**
22	20958	20959	A77	GLASGOW	NB	1,155	804	-30%	**11.2**
22	20972	20976	A8	GLASGOW	NB	468	547	17%	**3.5**
22	20936	20937	A8	GLASGOW	NB	300	699	133%	**17.9**
22	20281	20386	A739	GLASGOW	NB	1,932	1,824	-6%	**2.5**
22	21113	21100	M8 Kingston Bridge	GLASGOW	NB	4,575	4,273	-7%	**4.5**
22	21110	21318	M8 Kingston Bridge	GLASGOW	NB	1,184	1,229	4%	**1.3**
2201	29971	28885	A898 - Erskine Bridge	GLASGOW	SB	1,190	1,189	0%	**0.0**
2201	20937	20936	A8	GLASGOW	SB	602	848	41%	**9.2**
2201	20385	20346	A739	GLASGOW	SB	1,689	1,534	-9%	**3.9**
2201	21101	21106	M8 Kingston Bridge	GLASGOW	SB	5,508	5,448	-1%	**0.8**
2201	20961	20960	A77	GLASGOW	SB	889	965	8%	**2.5**
23	21496	56351	M8	GLASGOW	EB	4,673	4,816	3%	**2.1**
2301	21497	56359	M8	GLASGOW	WB	4,383	4,691	7%	**4.6**
25	25564	25568	A803	CENTRAL & TAYSIDE	EB	306	318	4%	**0.7**
25	25106	25107	A80	CENTRAL & TAYSIDE	NB	2,124	2,185	3%	**1.3**
25	25140	25141	B816	CENTRAL & TAYSIDE	NB	519	522	1%	**0.1**
2501	25568	25564	A803	CENTRAL & TAYSIDE	WB	285	318	12%	**1.9**
2501	25139	25108	A80	CENTRAL & TAYSIDE	SB	2,258	2,400	6%	**2.9**
2501	25143	25142	B816	CENTRAL & TAYSIDE	SB	613	519	-15%	**4.0**
27	36869	36870	A85	CENTRAL & TAYSIDE	EB	255	323	27%	**4.0**
27	36957	36956	A9 (North of Perth)	CENTRAL & TAYSIDE	SB	915	764	-17%	**5.2**
27	36809	36822	A9 (South of Perth)	CENTRAL & TAYSIDE	SB	1098	948	-14%	**4.7**
2701	36870	36869	A85	CENTRAL & TAYSIDE	WB	249	349	40%	**5.8**
2701	36954	36955	A9 (North of Perth)	CENTRAL & TAYSIDE	NB	887	772	-13%	**4.0**
2701	36653	36811	A9 (South of Perth)	CENTRAL & TAYSIDE	NB	962	842	-13%	**4.0**
28	33349	38768	A92 Tay Bridge	CENTRAL & TAYSIDE	NB	738	807	9%	**2.5**
28	37406	37322	M90	CENTRAL & TAYSIDE	NB	1,113	972	-13%	**4.4**
2801	38853	33350	A92 Tay Bridge	CENTRAL & TAYSIDE	SB	734	908	24%	**6.1**
2801	37324	37405	M90	CENTRAL & TAYSIDE	SB	1,315	1,047	-20%	**7.8**
29	3136	3326	A709	SOUTH	EB	297	331	12%	**1.9**
29	3351	3327	A75	SOUTH	EB	385	481	25%	**4.6**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
29	2806	2817	A75	SOUTH	WB	365	414	13%	**2.5**
29	3232	3291	A76	SOUTH	NB	457	638	40%	**7.7**
29	3242	3285	A701	SOUTH	NB	767	600	-22%	**6.4**
2901	3326	3136	A709	SOUTH	WB	264	323	22%	**3.4**
2901	3327	3351	A75	SOUTH	WB	424	527	24%	**4.7**
2901	2817	2806	A75	SOUTH	EB	383	411	7%	**1.4**
2901	3291	3232	A76	SOUTH	SB	485	594	22%	**4.7**
2901	3285	3242	A701	SOUTH	SB	768	611	-20%	**6.0**
30	14278	14281	A74 (M)	SOUTH	NB	1,071	891	-17%	**5.8**
3001	14280	14277	A74 (M)	SOUTH	SB	1,293	1132	-12%	**4.6**
31	4572	4564	A7	SOUTH	SB	168	187	11%	**1.4**
31	5050	5037	A68	SOUTH	SB	195	242	24%	**3.2**
31	7063	7068	A1	SOUTH	SB	424	310	-27%	**6.0**
3101	4564	4572	A7	SOUTH	NB	166	176	6%	**0.8**
3101	5037	5050	A68	SOUTH	NB	208	273	31%	**4.2**
3101	7067	7066	A1	SOUTH	NB	423	308	-27%	**6.0**
32	52556	52540	A82	HIGHLAND	NB	106	116	9%	**1.0**
32	54279	54280	A9	HIGHLAND	NB	329	365	11%	**2.0**
3201	52540	52556	A82	HIGHLAND	SB	96	102	6%	**0.6**
3201	54280	54279	A9	HIGHLAND	SB	376	344	-8%	**1.7**
33	49566	49563	A83	WEST	EB	181	137	-24%	**3.5**
33	49583	49584	A85	WEST	EB	98	81	-17%	**1.8**
3301	49563	49566	A83	WEST	WB	166	121	-27%	**3.7**
3301	49584	49583	A85	WEST	WB	91	72	-21%	**2.1**
34	29847	29857	A82	WEST	EB	1,343	1,333	-1%	**0.3**
3401	29856	29846	A82	WEST	WB	1,572	1,484	-6%	**2.3**
35	4151	4152	A701	SOUTH	NB	72	97	34%	**2.7**
35	14486	14487	A70	SOUTH	NB	56	67	19%	**1.4**
35	14525	14526	A702	SOUTH	NB	170	137	-19%	**2.6**
3501	4152	4151	A701	SOUTH	SB	73	91	24%	**2.0**
3501	14487	14486	A70	SOUTH	SB	61	81	33%	**2.4**
3501	14526	14525	A702	SOUTH	SB	196	147	-25%	**3.7**
36	48243	48189	Elgin Site 1	HIGHLAND	EB	374	390	4%	**0.8**
36	48227	48059	Elgin Site 2	HIGHLAND	SB	122	97	-21%	**2.4**
3601	48189	48243	Elgin Site 1	HIGHLAND	WB	388	514	33%	**6.0**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
3601	48059	48227	Elgin Site 2	HIGHLAND	NB	146	174	19%	2.2
37	47942	47943	Elgin Site 6	HIGHLAND	EB	317	493	55%	8.7
37	48249	48248	Elgin Site 3	HIGHLAND	SB	198	237	20%	2.7
3701	48248	48249	Elgin Site 3	HIGHLAND	NB	207	189	-9%	1.3
3701	47943	47942	Elgin Site 6	HIGHLAND	WB	325	375	15%	2.7
38	52950	52951	Highland Site 4	HIGHLAND	NB	213	228	7%	1.0
38	53783	53717	Highland Site 6	HIGHLAND	NB	918	868	-5%	1.7
3801	52951	52950	Highland Site 4	HIGHLAND	SB	235	180	-23%	3.8
3801	53718	53782	Highland Site 6	HIGHLAND	SB	1,046	1,138	9%	2.8
39	53791	53794	Highland Site 3	HIGHLAND	EB	494	490	-1%	0.2
39	54103	54097	Tomatin A9	HIGHLAND	SB	336	310	-8%	1.5
3901	53794	53793	Highland Site 3	HIGHLAND	WB	504	519	3%	0.7
3901	54097	54103	Tomatin A9	HIGHLAND	NB	388	464	20%	3.7
40	32013	31920	Clackmannan Site 2	CENTRAL & TAYSIDE	SB	-	-	-	-
40	32124	32168	Clackmannan Site 1	CENTRAL & TAYSIDE	WB	-	-	-	-
40	32022	32021	Clackmannan Site 7	CENTRAL & TAYSIDE	WB	-	-	-	-
40	32080	32108	Collyland Road	CENTRAL & TAYSIDE	WB	141	131	-7%	0.8
40	32102	32095	B908	CENTRAL & TAYSIDE	SB	127	150	18%	1.9
4001	32021	32022	Clackmannan Site 7	CENTRAL & TAYSIDE	EB	-	-	-	-
4001	31920	32013	Clackmannan Site 2	CENTRAL & TAYSIDE	NB	-	-	-	-
4001	32168	32124	Clackmannan Site 1	CENTRAL & TAYSIDE	EB	-	-	-	-
4001	32108	32080	Collyland Road	CENTRAL & TAYSIDE	EB	161	131	-18%	2.5
4001	32095	32102	B908	CENTRAL & TAYSIDE	NB	128	147	15%	1.6
41	11060	11076	Livingston Site 1	CENTRAL & TAYSIDE	EB	384	599	56%	9.7
41	11092	11096	Livingston Site 3	CENTRAL & TAYSIDE	EB	284	335	18%	2.9
41	10593	11125	M8	CENTRAL & TAYSIDE	EB	1,861	1,728	-7%	3.1
4101	11096	11092	Livingston Site 3	CENTRAL & TAYSIDE	WB	287	216	-25%	4.5
4101	11076	11060	Livingston Site 1	CENTRAL & TAYSIDE	WB	388	447	15%	2.9
4101	10794	10591	M8	CENTRAL & TAYSIDE	WB	2,110	1,943	-8%	3.7
42	18798	18771	Irvine Site 6	SOUTH	SB	152	227	49%	5.5
42	18445	18453	Irvine Site 10	SOUTH	NB	631	936	48%	10.9
42	19075	19074	Irvine Site 7A	SOUTH	WB	63	97	53%	3.8
42	19046	19045	Irvine Site 8	SOUTH	WB	241	226	-6%	1.0
42	18799	18773	Irvine Site 15	SOUTH	SB	580	600	3%	0.8
42	18839	18844	B7080	SOUTH	SB	888	609	-31%	10.2

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
42	18538	18539	A78	SOUTH	NB	911	841	-8%	**2.4**
42	19024	18532	A71	SOUTH	WB	798	1,005	26%	**6.9**
4201	19045	19046	Irvine Site 8	SOUTH	EB	208	182	-12%	**1.9**
4201	18773	18799	Irvine Site 15	SOUTH	NB	643	570	-11%	**3.0**
4201	18771	18798	Irvine Site 6	SOUTH	NB	136	155	14%	**1.6**
4201	18454	18446	Irvine Site 10	SOUTH	SB	711	717	1%	**0.2**
4201	18541	18540	A78	SOUTH	SB	904	840	-7%	**2.2**
4201	18533	19026	A71	SOUTH	EB	805	977	21%	**5.8**
4201	18844	18839	B7080	SOUTH	NB	764	556	-27%	**8.1**
43	14960	14959	Kilmarnock Site 7	SOUTH	WB	89	158	77%	**6.2**
43	14726	14621	SITM4 Site 9	SOUTH	WB	1,236	981	-21%	**7.7**
43	15220	15598	SITM4 Site 13	SOUTH	NB	867	977	13%	**3.6**
43	15119	15151	Kilmarnock Site 8	SOUTH	NB	22	133	505%	**12.6**
4301	15151	15119	Kilmarnock Site 8	SOUTH	SB	34	200	488%	**15.4**
4301	14959	14960	Kilmarnock Site 7	SOUTH	EB	99	118	19%	**1.8**
4301	14620	14724	SITM4 Site 9	SOUTH	EB	1,205	919	-24%	**8.8**
4301	15602	15218	SITM4 Site 13	SOUTH	SB	864	836	-3%	**1.0**
4301	15244	15196	B7038	SOUTH	SB	52	140	168%	**9.0**
44	55494	55488	A74	SOUTH	NB	1,248	1,033	-17%	**6.4**
4401	55488	55494	A74	SOUTH	SB	1,428	1233	-14%	**5.3**
45	3992	3988	A7	SOUTH	NB	144	147	2%	**0.3**
4501	3988	3992	A7	SOUTH	SB	131	157	20%	**2.2**
46	5266	5265	A6088	SOUTH	NB	144	103	-28%	**3.7**
4601	5265	5266	A6088	SOUTH	SB	116	83	-28%	**3.3**
47	5266	5268	A68	SOUTH	NB	120	125	4%	**0.4**
4701	5268	5266	A68	SOUTH	SB	135	120	-11%	**1.3**
48	5679	5686	A698	SOUTH	EB	172	246	43%	**5.1**
4801	5686	5679	A698	SOUTH	WB	169	252	49%	**5.8**
49	5847	5849	A1	SOUTH	NB	415	412	-1%	**0.2**
4901	5849	5847	A1	SOUTH	SB	399	422	6%	**1.1**

PM Peak Hour Link Count Validation

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
1	46340	46338	A96	ABERDEEN	NB	634	593	-7%	1.7
1	46364	46365	A947	ABERDEEN	NB	550	658	20%	4.4
1	47570	47582	B997	ABERDEEN	NB	156	178	14%	1.7
1	44153	44155	A90	ABERDEEN	NB	553	524	-5%	1.3
1	47573	47576	B999	ABERDEEN	NB	171	89	-48%	7.2
101	46365	46364	A947	ABERDEEN	SB	526	680	29%	6.3
101	47582	47570	B997	ABERDEEN	SB	156	172	10%	1.2
101	47576	47573	B999	ABERDEEN	SB	143	97	-32%	4.2
101	46339	46341	A96	ABERDEEN	SB	702	638	-9%	2.5
101	44156	44154	A90	ABERDEEN	SB	518	492	-5%	1.2
2	46310	46251	A944	ABERDEEN	EB	230	349	52%	7.0
2	46304	46245	B9119	ABERDEEN	EB	543	379	-30%	7.6
2	46458	46459	A93	ABERDEEN	EB	284	425	50%	7.5
2	43805	43808	B9077	ABERDEEN	WB	182	152	-16%	2.3
201	43808	43805	B9077	ABERDEEN	EB	159	132	-17%	2.3
201	46251	46310	A944	ABERDEEN	WB	295	365	24%	3.9
201	46245	46304	B9119	ABERDEEN	WB	539	396	-27%	6.6
201	46459	46458	A93	ABERDEEN	WB	292	444	52%	7.9
3	46029	46030	A90	ABERDEEN	NB	1,271	1,212	-5%	1.7
301	46012	46010	A90	ABERDEEN	SB	1187	1234	4%	1.4
8	8578	8564	A90	EDINBURGH	SB	1,151	1,254	9%	3.0
8	8334	8335	A71	EDINBURGH	EB	1,180	1,275	8%	2.7
8	8260	8274	A70	EDINBURGH	EB	523	396	-24%	5.9
8	8527	8301	A8	EDINBURGH	EB	1,445	1,356	-6%	2.4
8	8429	8437	M8	EDINBURGH	EB	1,878	1,834	-2%	1.0
801	8581	8579	A90	EDINBURGH	NB	1,230	1,423	16%	5.3
801	8335	8334	A71	EDINBURGH	WB	1,250	1,526	22%	7.4
801	8274	8260	A70	EDINBURGH	WB	546	374	-32%	8.0
801	8528	8367	A8	EDINBURGH	WB	1,821	1,904	5%	1.9
801	8422	8428	M8	EDINBURGH	WB	1,658	1,598	-4%	1.5
9	8659	8668	A702	EDINBURGH	SB	649	730	13%	3.1
9	7676	7784	Old Dalkeith Road	EDINBURGH	EB	485	601	24%	5.0
9	7360	7375	A701	EDINBURGH	SB	713	733	3%	0.7
9	7364	7363	B702	EDINBURGH	SB	430	9	-98%	28.4
9	7668	7688	A7	EDINBURGH	SB	454	623	37%	7.3

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
9	7748	7750	B6392	EDINBURGH	SB	200	142	-29%	4.5
9	5867	5866	A6094	EDINBURGH	SB	165	157	-5%	0.6
9	6029	6012	A6124	EDINBURGH	SB	80	105	32%	2.6
9	9362	7357	Lasswade Road	EDINBURGH	SB	366	384	5%	0.9
901	8668	8659	A702	EDINBURGH	NB	486	604	24%	5.1
901	7377	7359	A701	EDINBURGH	NB	564	668	18%	4.2
901	7784	7676	Old Dalkeith Road	EDINBURGH	WB	511	681	33%	7.0
901	7363	7364	B702	EDINBURGH	NB	399	9	-98%	27.3
901	7688	7668	A7	EDINBURGH	NB	545	653	20%	4.4
901	7750	7748	B6392	EDINBURGH	NB	187	128	-32%	4.7
901	5866	5867	A6094	EDINBURGH	NB	184	168	-9%	1.2
901	6012	6029	A6124	EDINBURGH	NB	91	115	27%	2.4
901	7357	9362	Lasswade Road	EDINBURGH	NB	302	378	25%	4.1
10	6037	6038	A1	EDINBURGH	EB	1,454	1,239	-15%	5.9
10	6035	6036	A199	EDINBURGH	EB	274	328	20%	3.1
10	6077	6076	B1361	EDINBURGH	EB	238	194	-19%	3.0
10	6146	6147	B1348	EDINBURGH	EB	140	227	62%	6.4
1001	6034	6033	A1	EDINBURGH	WB	1,324	1,222	-8%	2.9
1001	6036	6035	A199	EDINBURGH	WB	242	265	10%	1.5
1001	6076	6077	B1361	EDINBURGH	WB	239	202	-15%	2.5
1001	6147	6146	B1348	EDINBURGH	WB	135	198	47%	4.9
11	9272	9271	A720	EDINBURGH	EB	2,365	2,459	4%	1.9
11	9274	9275	B701	EDINBURGH	EB	251	217	-13%	2.2
1101	9287	9270	A720	EDINBURGH	WB	2,465	2,474	0%	0.2
1101	9275	9274	B701	EDINBURGH	WB	257	234	-9%	1.5
12	31705	31753	A91	EDINBURGH	NB	680	673	-1%	0.3
12	8166	8167	Forth Road Bridge	EDINBURGH	NB	1,931	2,069	7%	3.1
12	27020	27021	A876 - Kincardine Bridge	EDINBURGH	NB	937	961	3%	0.8
12	31724	31725	A9	EDINBURGH	NB	529	562	6%	1.4
12	31425	31426	Cornton Rd	EDINBURGH	NB	236	217	-8%	1.2
1201	31753	31705	A91	EDINBURGH	SB	704	703	0%	0.0
1201	8169	8168	Forth Road Bridge	EDINBURGH	SB	2,099	2,070	-1%	0.6
1201	27021	27020	A876 - Kincardine Bridge	EDINBURGH	SB	862	939	9%	2.6
1201	31725	31724	A9	EDINBURGH	SB	542	602	11%	2.5
1201	31426	31425	Cornton Rd	EDINBURGH	SB	217	220	1%	0.2
13	34045	34035	A907	EDINBURGH	EB	263	322	22%	3.4
13	33928	33944	A985	EDINBURGH	EB	406	460	13%	2.6

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
13	34194	34192	A823	EDINBURGH	SB	144	132	-9%	1.1
1301	34035	34045	A907	EDINBURGH	WB	249	288	16%	2.4
1301	33944	33928	A985	EDINBURGH	WB	352	426	21%	3.7
1301	34192	34194	A823	EDINBURGH	NB	141	108	-23%	2.9
14	35074	35076	B925	EDINBURGH	EB	43	120	179%	8.5
14	35182	35223	B9157	EDINBURGH	EB	136	105	-23%	2.9
14	35191	35202	A921	EDINBURGH	NB	309	274	-11%	2.0
14	34679	34721	M90	EDINBURGH	NB	912	887	-3%	0.8
14	34852	34894	A92	EDINBURGH	NB	1,501	1,533	2%	0.8
14	38468	38450	B996	EDINBURGH	NB	119	147	24%	2.5
14	34911	34912	B981	EDINBURGH	EB	377	282	-25%	5.2
1401	35076	35074	B925	EDINBURGH	WB	33	116	250%	9.6
1401	35223	35182	B9157	EDINBURGH	WB	140	111	-21%	2.6
1401	35202	35191	A921	EDINBURGH	SB	296	256	-14%	2.4
1401	34722	34678	M90	EDINBURGH	SB	965	804	-17%	5.4
1401	34893	34851	A92	EDINBURGH	SB	1,481	1,501	1%	0.5
1401	38450	38468	B996	EDINBURGH	SB	121	139	15%	1.6
1401	34912	34911	B981	EDINBURGH	WB	359	273	-24%	4.9
15	21578	21579	A81	GLASGOW	NB	560	414	-26%	6.6
15	22258	22261	A803	GLASGOW	NB	789	973	23%	6.2
15	21545	21717	A879	GLASGOW	NB	572	571	0%	0.1
15	57963	57961	Maryhill Rd (A81)	GLASGOW	NB	402	671	67%	11.6
1501	21579	21578	A81	GLASGOW	SB	549	487	-11%	2.7
1501	21717	21545	A879	GLASGOW	SB	435	550	26%	5.2
1501	22277	22260	A803	GLASGOW	SB	803	993	24%	6.4
1501	57961	57963	Maryhill Rd (A81)	GLASGOW	SB	409	549	34%	6.4
16	57138	57137	Argyle Street	GLASGOW	EB	284	594	109%	14.8
16	21550	21549	A82	GLASGOW	EB	696	1,558	124%	25.7
16	21219	21300	A814	GLASGOW	EB	1,785	1,178	-34%	15.8
1601	57137	57138	Argyle Street	GLASGOW	WB	421	572	36%	6.8
1601	21549	21550	A82	GLASGOW	WB	584	1,452	149%	27.2
1601	21305	21218	A814	GLASGOW	WB	1,455	984	-32%	13.5
17	22771	22323	Cumbernauld Road	GLASGOW	WB	283	413	46%	7.0
17	22882	22423	M80	GLASGOW	WB	1,900	1,771	-7%	3.0
1701	22323	22771	Cumbernauld Road	GLASGOW	EB	250	404	62%	8.5
1701	22422	22883	M80	GLASGOW	EB	1,891	1,725	-9%	3.9
18	22200	22679	A8	GLASGOW	EB	177	224	27%	3.3

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
18	21991	21980	A89	GLASGOW	EB	390	492	26%	**4.8**
18	22249	22252	M8	GLASGOW	EB	4,141	4,050	-2%	**1.4**
18	22241	22363	B765	GLASGOW	EB	143	22	-85%	**13.3**
1801	22680	22183	A8	GLASGOW	WB	175	194	11%	**1.4**
1801	22363	22241	B765	GLASGOW	WB	130	49	-63%	**8.6**
1801	22251	22246	M8	GLASGOW	WB	3,415	3,648	7%	**3.9**
19	12380	12403	A724	GLASGOW	EB	473	561	19%	**3.9**
19	12133	12132	A749	GLASGOW	SB	621	766	23%	**5.5**
19	22460	22507	M74	GLASGOW	EB	1,295	1,645	27%	**9.1**
19	12424	12402	B759	GLASGOW	SB	310	408	32%	**5.2**
1901	12403	12380	A724	GLASGOW	WB	436	553	27%	**5.3**
1901	12145	12144	A749	GLASGOW	NB	708	854	21%	**5.2**
1901	22506	22459	M74	GLASGOW	WB	1,370	1,520	11%	**4.0**
1901	12402	12424	B759	GLASGOW	NB	342	371	9%	**1.5**
20	19807	19808	A736	GLASGOW	NB	600	855	42%	**9.4**
20	57414	57408	Peat Road	GLASGOW	NB	310	314	1%	**0.2**
20	19788	19803	M77	GLASGOW	NB	2,063	1,844	-11%	**5.0**
20	19452	19453	B769	GLASGOW	NB	463	409	-12%	**2.6**
20	19579	19580	A77	GLASGOW	NB	601	559	-7%	**1.8**
20	20422	20450	B766	GLASGOW	NB	446	583	31%	**6.0**
20	19691	19689	B767	GLASGOW	NB	496	435	-12%	**2.8**
2001	19810	19809	A736	GLASGOW	SB	646	794	23%	**5.5**
2001	57409	57413	Peat Road	GLASGOW	SB	305	398	30%	**4.9**
2001	19804	19785	M77	GLASGOW	SB	2,086	2,292	10%	**4.4**
2001	19453	19452	B769	GLASGOW	SB	462	372	-19%	**4.4**
2001	19580	19579	A77	GLASGOW	SB	573	557	-3%	**0.7**
2001	20446	20449	B766	GLASGOW	SB	429	554	29%	**5.7**
2001	19689	19691	B767	GLASGOW	SB	435	397	-9%	**1.9**
21	28977	28979	A761	GLASGOW	EB	374	653	75%	**12.3**
21	28779	29037	M8	GLASGOW	EB	3,577	3,393	-5%	**3.1**
2101	28979	28977	A761	GLASGOW	WB	441	598	36%	**6.9**
2101	29038	28788	M8	GLASGOW	WB	3,581	3,450	-4%	**2.2**
22	28884	29970	A898 - Erskine Bridge	GLASGOW	NB	1,074	1,105	3%	**0.9**
22	20958	20959	A77	GLASGOW	NB	1,155	804	-30%	**11.2**
22	20972	20976	A8	GLASGOW	NB	468	547	17%	**3.5**
22	20936	20937	A8	GLASGOW	NB	300	699	133%	**17.9**
22	20281	20386	A739	GLASGOW	NB	1,932	1,824	-6%	**2.5**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
22	21113	21100	M8 Kingston Bridge	GLASGOW	NB	4,575	4,273	-7%	**4.5**
22	21110	21318	M8 Kingston Bridge	GLASGOW	NB	1,184	1,229	4%	**1.3**
2201	29971	28885	A898 - Erskine Bridge	GLASGOW	SB	1,190	1,189	0%	**0.0**
2201	20937	20936	A8	GLASGOW	SB	602	848	41%	**9.2**
2201	20385	20346	A739	GLASGOW	SB	1,689	1,534	-9%	**3.9**
2201	21101	21106	M8 Kingston Bridge	GLASGOW	SB	5,508	5,448	-1%	**0.8**
2201	20961	20960	A77	GLASGOW	SB	889	965	8%	**2.5**
23	21496	56351	M8	GLASGOW	EB	4,673	4,816	3%	**2.1**
2301	21497	56359	M8	GLASGOW	WB	4,383	4,691	7%	**4.6**
25	25564	25568	A803	CENTRAL & TAYSIDE	EB	306	318	4%	**0.7**
25	25106	25107	A80	CENTRAL & TAYSIDE	NB	2,124	2,185	3%	**1.3**
25	25140	25141	B816	CENTRAL & TAYSIDE	NB	519	522	1%	**0.1**
2501	25568	25564	A803	CENTRAL & TAYSIDE	WB	285	318	12%	**1.9**
2501	25139	25108	A80	CENTRAL & TAYSIDE	SB	2,258	2,400	6%	**2.9**
2501	25143	25142	B816	CENTRAL & TAYSIDE	SB	613	519	-15%	**4.0**
27	36869	36870	A85	CENTRAL & TAYSIDE	EB	255	323	27%	**4.0**
27	36957	36956	A9 (North of Perth)	CENTRAL & TAYSIDE	SB	915	764	-17%	**5.2**
27	36809	36822	A9 (South of Perth)	CENTRAL & TAYSIDE	SB	1098	948	-14%	**4.7**
2701	36870	36869	A85	CENTRAL & TAYSIDE	WB	249	349	40%	**5.8**
2701	36954	36955	A9 (North of Perth)	CENTRAL & TAYSIDE	NB	887	772	-13%	**4.0**
2701	36653	36811	A9 (South of Perth)	CENTRAL & TAYSIDE	NB	962	842	-13%	**4.0**
28	33349	38768	A92 Tay Bridge	CENTRAL & TAYSIDE	NB	738	807	9%	**2.5**
28	37406	37322	M90	CENTRAL & TAYSIDE	NB	1,113	972	-13%	**4.4**
2801	38853	33350	A92 Tay Bridge	CENTRAL & TAYSIDE	SB	734	908	24%	**6.1**
2801	37324	37405	M90	CENTRAL & TAYSIDE	SB	1,315	1,047	-20%	**7.8**
29	3136	3326	A709	SOUTH	EB	297	331	12%	**1.9**
29	3351	3327	A75	SOUTH	EB	385	481	25%	**4.6**
29	2806	2817	A75	SOUTH	WB	365	414	13%	**2.5**
29	3232	3291	A76	SOUTH	NB	457	638	40%	**7.7**
29	3242	3285	A701	SOUTH	NB	767	600	-22%	**6.4**
2901	3326	3136	A709	SOUTH	WB	264	323	22%	**3.4**
2901	3327	3351	A75	SOUTH	WB	424	527	24%	**4.7**
2901	2817	2806	A75	SOUTH	EB	383	411	7%	**1.4**
2901	3291	3232	A76	SOUTH	SB	485	594	22%	**4.7**
2901	3285	3242	A701	SOUTH	SB	768	611	-20%	**6.0**
30	14278	14281	A74 (M)	SOUTH	NB	1,071	891	-17%	**5.8**
3001	14280	14277	A74 (M)	SOUTH	SB	1,293	1132	-12%	**4.6**

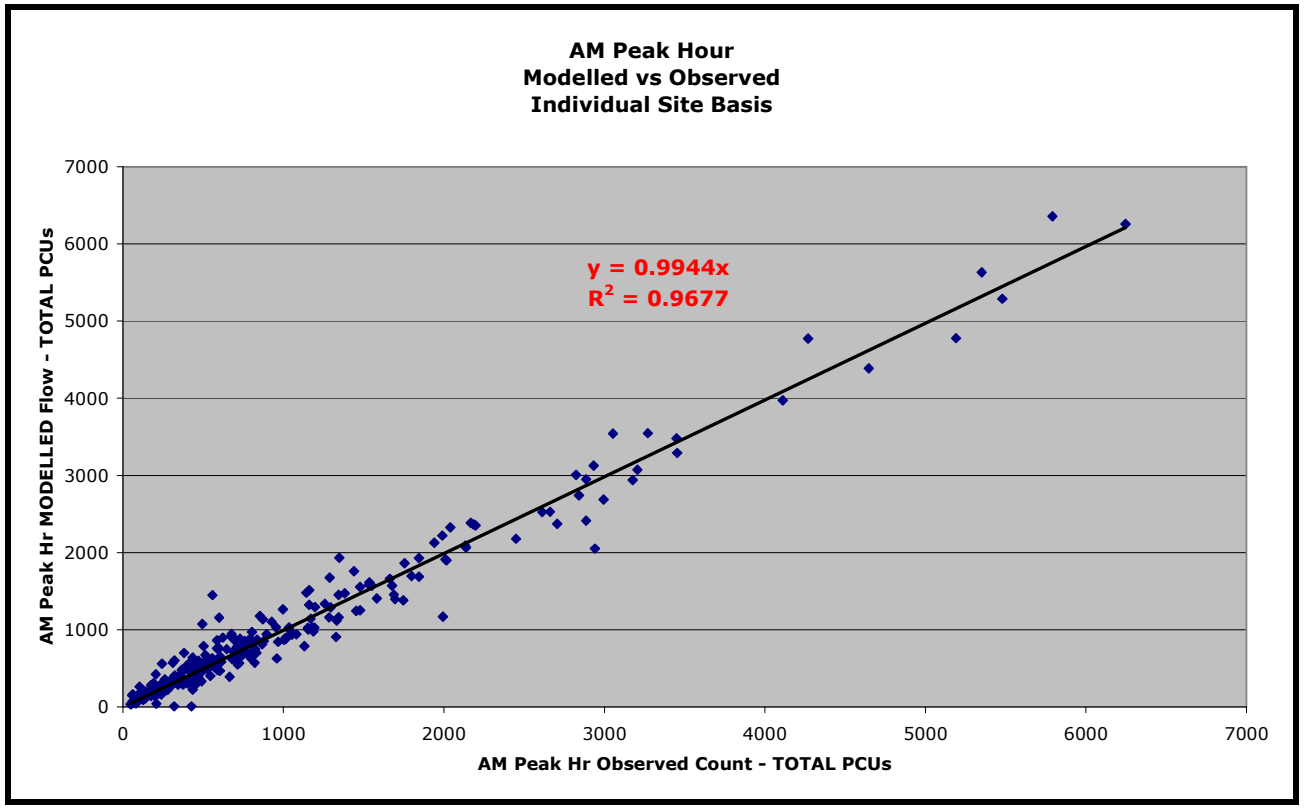
Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
31	4572	4564	A7	SOUTH	SB	168	187	11%	**1.4**
31	5050	5037	A68	SOUTH	SB	195	242	24%	**3.2**
31	7063	7068	A1	SOUTH	SB	424	310	-27%	**6.0**
3101	4564	4572	A7	SOUTH	NB	166	176	6%	**0.8**
3101	5037	5050	A68	SOUTH	NB	208	273	31%	**4.2**
3101	7067	7066	A1	SOUTH	NB	423	308	-27%	**6.0**
32	52556	52540	A82	HIGHLAND	NB	106	116	9%	**1.0**
32	54279	54280	A9	HIGHLAND	NB	329	365	11%	**2.0**
3201	52540	52556	A82	HIGHLAND	SB	96	102	6%	**0.6**
3201	54280	54279	A9	HIGHLAND	SB	376	344	-8%	**1.7**
33	49566	49563	A83	WEST	EB	181	137	-24%	**3.5**
33	49583	49584	A85	WEST	EB	98	81	-17%	**1.8**
3301	49563	49566	A83	WEST	WB	166	121	-27%	**3.7**
3301	49584	49583	A85	WEST	WB	91	72	-21%	**2.1**
34	29847	29857	A82	WEST	EB	1,343	1,333	-1%	**0.3**
3401	29856	29846	A82	WEST	WB	1,572	1,484	-6%	**2.3**
35	4151	4152	A701	SOUTH	NB	72	97	34%	**2.7**
35	14486	14487	A70	SOUTH	NB	56	67	19%	**1.4**
35	14525	14526	A702	SOUTH	NB	170	137	-19%	**2.6**
3501	4152	4151	A701	SOUTH	SB	73	91	24%	**2.0**
3501	14487	14486	A70	SOUTH	SB	61	81	33%	**2.4**
3501	14526	14525	A702	SOUTH	SB	196	147	-25%	**3.7**
36	48243	48189	Elgin Site 1	HIGHLAND	EB	374	390	4%	**0.8**
36	48227	48059	Elgin Site 2	HIGHLAND	SB	122	97	-21%	**2.4**
3601	48189	48243	Elgin Site 1	HIGHLAND	WB	388	514	33%	**6.0**
3601	48059	48227	Elgin Site 2	HIGHLAND	NB	146	174	19%	**2.2**
37	47942	47943	Elgin Site 6	HIGHLAND	EB	317	493	55%	**8.7**
37	48249	48248	Elgin Site 3	HIGHLAND	SB	198	237	20%	**2.7**
3701	48248	48249	Elgin Site 3	HIGHLAND	NB	207	189	-9%	**1.3**
3701	47943	47942	Elgin Site 6	HIGHLAND	WB	325	375	15%	**2.7**
38	52950	52951	Highland Site 4	HIGHLAND	NB	213	228	7%	**1.0**
38	53783	53717	Highland Site 6	HIGHLAND	NB	918	868	-5%	**1.7**
3801	52951	52950	Highland Site 4	HIGHLAND	SB	235	180	-23%	**3.8**
3801	53718	53782	Highland Site 6	HIGHLAND	SB	1,046	1,138	9%	**2.8**
39	53791	53794	Highland Site 3	HIGHLAND	EB	494	490	-1%	**0.2**
39	54103	54097	Tomatin A9	HIGHLAND	SB	336	310	-8%	**1.5**
3901	53794	53793	Highland Site 3	HIGHLAND	WB	504	519	3%	**0.7**

Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
3901	54097	54103	Tomatin A9	HIGHLAND	NB	388	464	20%	**3.7**
40	32013	31920	Clackmannan Site 2	CENTRAL & TAYSIDE	SB	-	-	-	**-**
40	32124	32168	Clackmannan Site 1	CENTRAL & TAYSIDE	WB	-	-	-	**-**
40	32022	32021	Clackmannan Site 7	CENTRAL & TAYSIDE	WB	-	-	-	**-**
40	32080	32108	Collyland Road	CENTRAL & TAYSIDE	WB	141	131	-7%	**0.8**
40	32102	32095	B908	CENTRAL & TAYSIDE	SB	127	150	18%	**1.9**
4001	32021	32022	Clackmannan Site 7	CENTRAL & TAYSIDE	EB	-	-	-	**-**
4001	31920	32013	Clackmannan Site 2	CENTRAL & TAYSIDE	NB	-	-	-	**-**
4001	32168	32124	Clackmannan Site 1	CENTRAL & TAYSIDE	EB	-	-	-	**-**
4001	32108	32080	Collyland Road	CENTRAL & TAYSIDE	EB	161	131	-18%	**2.5**
4001	32095	32102	B908	CENTRAL & TAYSIDE	NB	128	147	15%	**1.6**
41	11060	11076	Livingston Site 1	CENTRAL & TAYSIDE	EB	384	599	56%	**9.7**
41	11092	11096	Livingston Site 3	CENTRAL & TAYSIDE	EB	284	335	18%	**2.9**
41	10593	11125	M8	CENTRAL & TAYSIDE	EB	1,861	1,728	-7%	**3.1**
4101	11096	11092	Livingston Site 3	CENTRAL & TAYSIDE	WB	287	216	-25%	**4.5**
4101	11076	11060	Livingston Site 1	CENTRAL & TAYSIDE	WB	388	447	15%	**2.9**
4101	10794	10591	M8	CENTRAL & TAYSIDE	WB	2,110	1,943	-8%	**3.7**
42	18798	18771	Irvine Site 6	SOUTH	SB	152	227	49%	**5.5**
42	18445	18453	Irvine Site 10	SOUTH	NB	631	936	48%	**10.9**
42	19075	19074	Irvine Site 7A	SOUTH	WB	63	97	53%	**3.8**
42	19046	19045	Irvine Site 8	SOUTH	WB	241	226	-6%	**1.0**
42	18799	18773	Irvine Site 15	SOUTH	SB	580	600	3%	**0.8**
42	18839	18844	B7080	SOUTH	SB	888	609	-31%	**10.2**
42	18538	18539	A78	SOUTH	NB	911	841	-8%	**2.4**
42	19024	18532	A71	SOUTH	WB	798	1,005	26%	**6.9**
4201	19045	19046	Irvine Site 8	SOUTH	EB	208	182	-12%	**1.9**
4201	18773	18799	Irvine Site 15	SOUTH	NB	643	570	-11%	**3.0**
4201	18771	18798	Irvine Site 6	SOUTH	NB	136	155	14%	**1.6**
4201	18454	18446	Irvine Site 10	SOUTH	SB	711	717	1%	**0.2**
4201	18541	18540	A78	SOUTH	SB	904	840	-7%	**2.2**
4201	18533	19026	A71	SOUTH	EB	805	977	21%	**5.8**
4201	18844	18839	B7080	SOUTH	NB	764	556	-27%	**8.1**
43	14960	14959	Kilmarnock Site 7	SOUTH	WB	89	158	77%	**6.2**
43	14726	14621	SITM4 Site 9	SOUTH	WB	1,236	981	-21%	**7.7**
43	15220	15598	SITM4 Site 13	SOUTH	NB	867	977	13%	**3.6**
43	15119	15151	Kilmarnock Site 8	SOUTH	NB	22	133	505%	**12.6**
4301	15151	15119	Kilmarnock Site 8	SOUTH	SB	34	200	488%	**15.4**

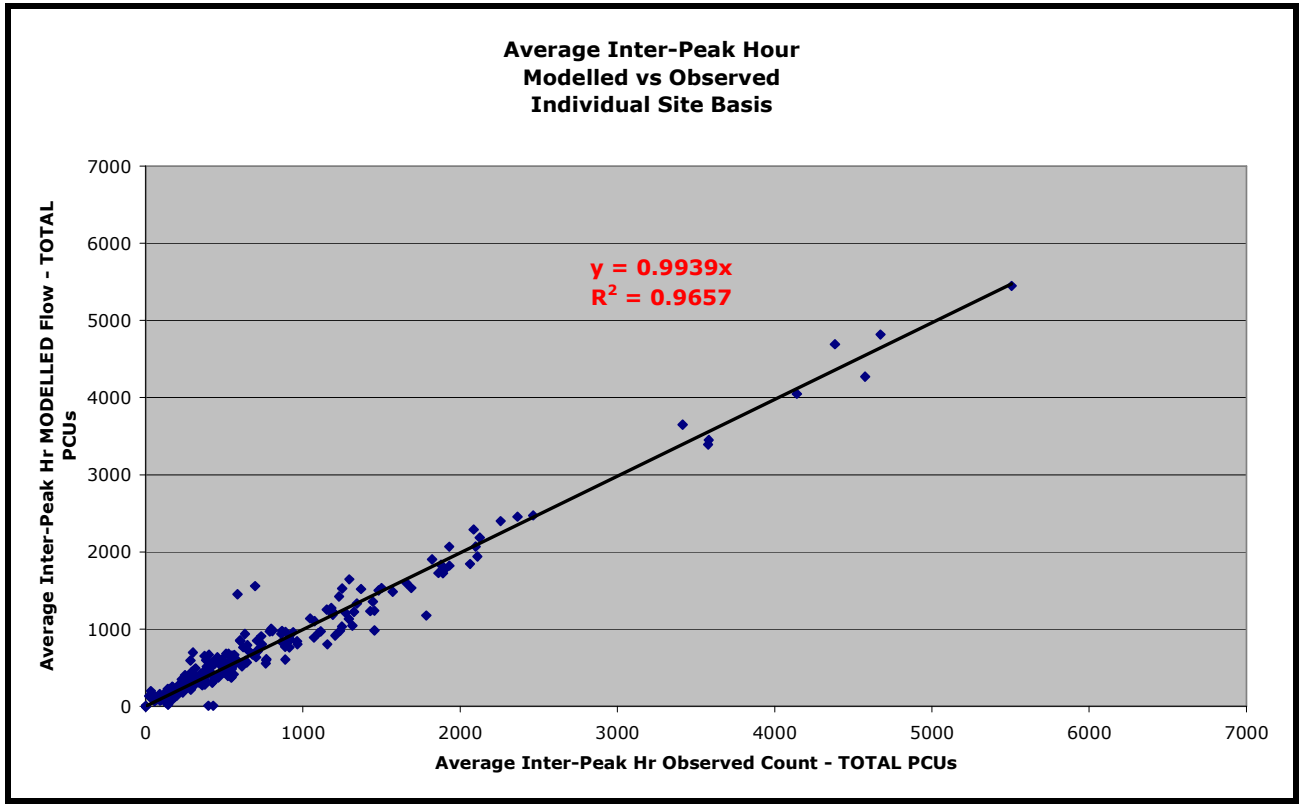
Screenline No.	A	B	Road	Screenline A3 Plot Area	Direction	TOTAL PCU Count	TOTAL PCU Flow	% Diff	GEH
4301	14959	14960	Kilmarnock Site 7	SOUTH	EB	99	118	19%	**1.8**
4301	14620	14724	SITM4 Site 9	SOUTH	EB	1,205	919	-24%	**8.8**
4301	15602	15218	SITM4 Site 13	SOUTH	SB	864	836	-3%	**1.0**
4301	15244	15196	B7038	SOUTH	SB	52	140	168%	**9.0**
44	55494	55488	A74	SOUTH	NB	1,248	1,033	-17%	**6.4**
4401	55488	55494	A74	SOUTH	SB	1,428	1233	-14%	**5.3**
45	3992	3988	A7	SOUTH	NB	144	147	2%	**0.3**
4501	3988	3992	A7	SOUTH	SB	131	157	20%	**2.2**
46	5266	5265	A6088	SOUTH	NB	144	103	-28%	**3.7**
4601	5265	5266	A6088	SOUTH	SB	116	83	-28%	**3.3**
47	5266	5268	A68	SOUTH	NB	120	125	4%	**0.4**
4701	5268	5266	A68	SOUTH	SB	135	120	-11%	**1.3**
48	5679	5686	A698	SOUTH	EB	172	246	43%	**5.1**
4801	5686	5679	A698	SOUTH	WB	169	252	49%	**5.8**
49	5847	5849	A1	SOUTH	NB	415	412	-1%	**0.2**
4901	5849	5847	A1	SOUTH	SB	399	422	6%	**1.1**

Appendix G -

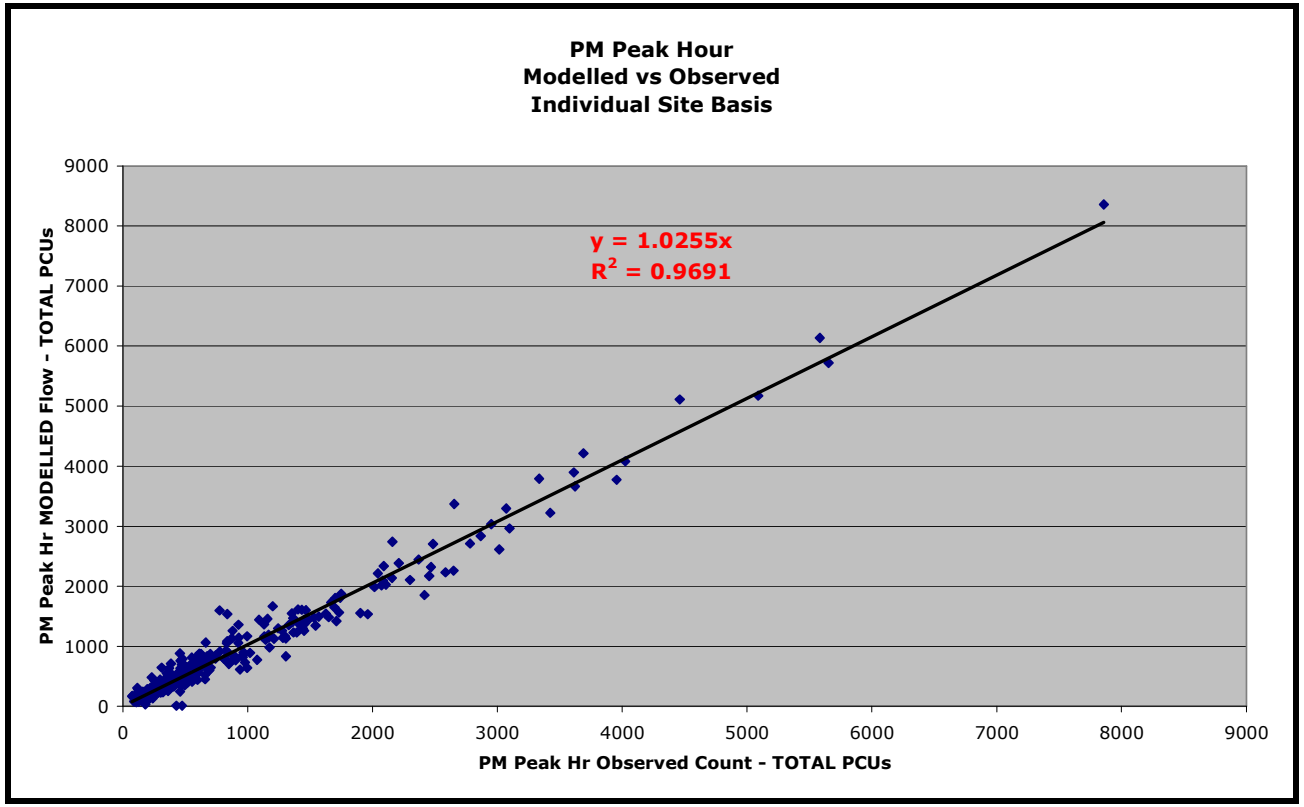
Modelled Flow Observed Count Correlation Graphs



AM Peak Hour Modelled Flow Observed Count Correlation Graph



Average Inter Peak Hour Modelled Flow Observed Count Correlation Graph



PM Peak Hour Modelled Flow Observed Count Correlation Graph

Appendix H – Total PCU Validation

AM Peak Hour Total Traffic Flow Validation – Motorways – M8

NB Yellow colour on an observed PCU Count indicates that the count does not hold with similar count data

Also note that all observed data is taken from SRTDb count sites and calculated over neutral days and months for a one year period (2007) where available.

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of Jnc 2	E	3,844	3,398	-12%	**7.4**
1b	West of Jnc 2	W	2,877	2,510	-13%	**7.1**
2a	West of Jnc 8	E	2,059	1,982	-4%	**1.7**
2b	West of Jnc 8	W	2,041	1,656	-19%	**9.0**
3a	Jnc 9-10	E	4,262	3,667	-14%	**9.5**
3b	Jnc 9-10	W	4,050	3,977	-2%	**1.1**
4a	Jnc 10-11	E	4,328	4,022	-7%	**4.7**
4b	Jnc 10-11	W	3,638	4,222	16%	**9.3**
5a	Jnc 23-24	E	2,859	3,428	20%	**10.1**
5b	Jnc 23-24	W	3,417	3,435	1%	**0.3**
6a	Jnc 24-25	E	3,696	4,174	13%	**7.6**
6b	Jnc 24-25	W	4,123	3,966	-4%	**2.5**
7a	Jnc 25-26	E	4,913	4,652	-5%	**3.8**
7b	Jnc 25-26	W	4,700	4,328	-8%	**5.5**
8a	Jnc 26	E	2,947	3,989	35%	**17.7**
8b	Jnc 26	W	3,424	3,502	2%	**1.3**
9a	Jnc 26-27	E	4,304	4,779	11%	**7.0**
9b	Jnc 26-27	W	4,016	3,972	-1%	**0.7**
10a	Jnc 29-30	E	2,538	3,043	20%	**9.6**
10b	Jnc 29-30	W	1,671	2,245	34%	**13.0**

PM Peak Hour Total Traffic Flow Validation – Motorways – M8

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of Jnc 2	E	2,745	2,232	-19%	**10.3**
1b	West of Jnc 2	W	4,020	3,243	-19%	**12.9**
2a	West of Jnc 8	E	2,395	2,119	-12%	**5.8**
2b	West of Jnc 8	W	1,952	1,638	-16%	**7.4**
3a	Jnc 9-10	E	5,422	4,759	-12%	**9.3**
3b	Jnc 9-10	W	3,575	3,591	0%	**0.3**
4a	Jnc 10-11	E	5,291	5,108	-3%	**2.5**
4b	Jnc 10-11	W	3,314	3,781	14%	**7.8**
5a	Jnc 23-24	E	2,143	3,060	43%	**18.0**
5b	Jnc 23-24	W	3,674	4,044	10%	**6.0**
6a	Jnc 24-25	E	2,790	3,926	41%	**19.6**
6b	Jnc 24-25	W	4,392	4,594	5%	**3.0**
7a	Jnc 25-26	E	3,874	4,036	4%	**2.6**
7b	Jnc 25-26	W	5,205	5,019	-4%	**2.6**
8a	Jnc 26	E	1,897	3,091	63%	**23.9**
8b	Jnc 26	W	3,601	4,253	18%	**10.4**
9a	Jnc 26-27	E	3,007	3,772	25%	**13.1**
9b	Jnc 26-27	W	4,284	5,174	21%	**12.9**
10a	Jnc 29-30	E	2,097	2,675	28%	**11.8**
10b	Jnc 29-30	W	1,598	3,098	94%	**31.0**

AM Peak Hour Total Traffic Flow Validation – Motorways – M80, M73, M80, M90 & M9

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
M80						
1a	Jnc 1-2	N	1,648	1,968	19%	**7.5**
1b	Jnc 1-2	S	3,219	2,950	-8%	**4.8**
M73						
1a	Jnc 1-2	N	4,045	3,303	-18%	**12.2**
1b	Jnc 1-2	S	1,583	1,352	-15%	**6.0**
2a	Jnc 3-4	N	4,045	3,303	-18%	**12.2**
2b	Jnc 3-4	S	4,157	2,942	-29%	**20.4**
M77						
1a	Jnc 1-2	N	2,344	3,766	61%	**25.7**
1b	Jnc 1-2	S	2,449	2,960	21%	**9.8**
2a	Jnc 3-4	N	2,865	2,986	4%	**2.2**
2b	Jnc 3-4	S	2,117	1,520	-28%	**14.0**
3a	South of Jnc 4a	N	2,087	2,449	17%	**7.6**
3b	South of Jnc 4a	S	1,853	1,400	-24%	**11.2**
4a	Jnc 5-6	N	2,313	2,015	-13%	**6.4**
4b	Jnc 5-6	S	2,061	1,728	-16%	**7.6**
5a	Jnc 6	N	2,083	1,761	-15%	**7.3**
5b	Jnc 6	S	1,995	1,510	-24%	**11.6**
M90						
1a	South of Jnc 1	S	2,332	2,878	23%	**10.7**
1b	Jnc 1-2	S	2,309	3,609	56%	**23.9**
M9						
1a	Jnc 1-1a	W	2,039	1,805	-11%	**5.3**
1b	Jnc 1a-2	W	955	704	-26%	**8.7**

PM Peak Hour Total Traffic Flow Validation – Motorways – M80, M73, M80, M90 & M9

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
M80						
1a	Jnc 1-2	N	2,991	2,963	-1%	**0.5**
1b	Jnc 1-2	S	1,799	2,234	24%	**9.7**
M73						
1a	Jnc 1-2	N	3,635	3,470	-5%	**2.8**
1b	Jnc 1-2	S	1,633	1,495	-8%	**3.5**
2a	Jnc 3-4	N	3,635	3,470	-5%	**2.8**
2b	Jnc 3-4	S	4,539	3,977	-12%	**8.6**
M77						
1a	Jnc 1-2	N	1,607	2,566	60%	**21.0**
1b	Jnc 1-2	S	4,232	4,933	17%	**10.4**
2a	Jnc 3-4	N	1,980	2,385	20%	**8.7**
2b	Jnc 3-4	S	3,643	2,816	-23%	**14.5**
3a	South of Jnc 4a	N	1,674	2,005	20%	**7.7**
3b	South of Jnc 4a	S	2,759	2,360	-14%	**7.9**
4a	Jnc 5-6	N	1,808	1,618	-11%	**4.6**
4b	Jnc 5-6	S	2,714	2,280	-16%	**8.7**
5a	Jnc 6	N	1,706	1,445	-15%	**6.6**
5b	Jnc 6	S	2,535	1,914	-25%	**13.2**
M90						
1a	South of Jnc 1	S	2,566	2,484	-3%	**1.6**
1b	Jnc 1-2	S	2,792	2,809	1%	**0.3**
M9						
1a	Jnc 1-1a	W	3,050	2,770	-9%	**5.2**
1b	Jnc 1a-2	W	2,083	1,354	-35%	**17.6**

AM Peak Hour Total Traffic Flow Validation – Motorways – M74 & A74 (M)

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
M74						
1a	Jnc 1-2	N	2,253	1,826	-19%	**9.5**
1b	Jnc 1-2	S	1,188	1,182	-1%	**0.2**
2a	Jnc 3-4	N	2,627	2,366	-10%	**5.2**
2b	Jnc 3-4	S	1,812	1,341	-26%	**11.9**
3a	Jnc 12-13	N	986	1,048	6%	**2.0**
3b	Jnc 12-13	S	857	988	15%	**4.3**
A74 (M)						
1a	South of Jnc 16	N	985	1,003	2%	**0.6**
1b	South of Jnc 16	S	799	777	-3%	**0.8**
2a	South of Jnc 18	N	1,087	1,043	-4%	**1.4**
2b	South of Jnc 18	S	861	866	1%	**0.2**
3a	Jnc 19-20	N	1,084	947	-13%	**4.3**
3b	Jnc 19-20	S	868	750	-14%	**4.1**
4a	Jnc 20-21	N	1,033	974	-6%	**1.9**
4b	Jnc 20-21	S	876	770	-12%	**3.7**

PM Peak Hour Total Traffic Flow Validation – Motorways – M74 & A74 (M)

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
M74						
1a	Jnc 1-2	N	1,416	1,531	8%	**3.0**
1b	Jnc 1-2	S	1,856	1,801	-3%	**1.3**
2a	Jnc 3-4	N	2,702	1,923	-29%	**16.2**
2b	Jnc 3-4	S	2,176	2,230	2%	**1.2**
3a	Jnc 12-13	N	1,187	1,260	6%	**2.1**
3b	Jnc 12-13	S	1,081	1,231	14%	**4.4**
A74 (M)						
1a	South of Jnc 16	N	1,109	1,239	12%	**3.8**
1b	South of Jnc 16	S	1,137	1,290	13%	**4.4**
2a	South of Jnc 18	N	1,189	1,275	7%	**2.5**
2b	South of Jnc 18	S	1,239	1,343	8%	**2.9**
3a	Jnc 19-20	N	1,203	1,155	-4%	**1.4**
3b	Jnc 19-20	S	1,251	1,239	-1%	**0.3**
4a	Jnc 20-21	N	1,208	1,186	-2%	**0.6**
4b	Jnc 20-21	S	1,222	1,273	4%	**1.5**

AM Peak Hour Total Traffic Flow Validation – East of Scotland – A720 Edinburgh Bypass

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	East of Gogarburn	E	1,135	2,004	77%	**21.9**
1b	East of Gogarburn	W	1,936	2,078	7%	**3.2**
2a	East of A71	E	2,976	3,322	12%	**6.2**
3a	West of Dreghorn	E	3,399	3,799	12%	**6.7**
3b	West of Dreghorn	W	3,888	4,475	15%	**9.1**
4a	East of Dreghorn	E	3,060	3,665	20%	**10.4**
4b	East of Dreghorn	W	2,997	4,270	42%	**21.1**
5a	East of Straiton	E	2,605	2,922	12%	**6.0**
6a	Gilmerton	E	2,275	2,419	6%	**3.0**
6b	Gilmerton	W	1,727	2,548	48%	**17.8**
7a	West of Sherriffhall	E	1,664	2,157	30%	**11.3**
7b	West of Sherriffhall	W	1,310	2,319	77%	**23.7**
8a	East of Old Craighall	E	1,436	1,535	7%	**2.6**

PM Peak Hour Total Traffic Flow Validation – East of Scotland – A720 Edinburgh Bypass

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	East of Gogarburn	E	2,250	2,090	-7%	**3.4**
1b	East of Gogarburn	W	794	2,062	160%	**33.5**
2a	East of A71	E	3,350	4,025	20%	**11.1**
3a	West of Dreghorn	E	4,022	4,854	21%	**12.5**
3b	West of Dreghorn	W	3,166	3,908	23%	**12.5**
4a	East of Dreghorn	E	3,655	4,576	25%	**14.4**
4b	East of Dreghorn	W	2,834	3,781	33%	**16.5**
5a	East of Straiton	E	3,110	3,403	9%	**5.1**
6a	Gilmerton	E	2,610	2,793	7%	**3.5**
6b	Gilmerton	W	2,024	2,575	27%	**11.5**
7a	West of Sherriffhall	E	1,977	2,251	14%	**6.0**
7b	West of Sherriffhall	W	1,526	2,411	58%	**20.0**
8a	East of Old Craighall	E	1,721	1,933	12%	**5.0**

AM Peak Hour Total Traffic Flow Validation – East of Scotland – A702

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	North of West Linton	N	262	563	115%	**14.8**
1b		S	156	301	93%	**9.6**
2a	North of Biggar	N	157	173	10%	**1.2**
2b		S	107	121	13%	**1.3**
3a	North of A73	N	144	164	14%	**1.6**
3b		S	163	103	-37%	**5.2**
4a	North of M74	N	262	242	-8%	**1.2**

PM Peak Hour Total Traffic Flow Validation – East of Scotland – A702

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	North of West Linton	N	168	344	105%	**11.0**
1b		S	395	442	12%	**2.3**
2a	North of Biggar	N	153	99	-36%	**4.9**
2b		S	209	141	-33%	**5.1**
3a	North of A73	N	153	149	-2%	**0.3**
3b		S	202	351	74%	**9.0**
4a	North of M74	N	251	176	-30%	**5.1**

AM Peak Hour Total Traffic Flow Validation – East of Scotland – A68

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	North of B6457	N	406	305	-25%	**5.4**
1b		S	263	174	-34%	**6.0**
2a	South of A697	N	232	211	-9%	**1.4**
2b		S	172	106	-38%	**5.6**
3a	South of Lauder	N	189	168	-11%	**1.6**
3b		S	223	136	-39%	**6.5**
4a	South of A699	N	374	215	-42%	**9.2**
4b		S	235	144	-39%	**6.6**
5a	South of A698	N	313	381	22%	**3.6**
5b		S	283	266	-6%	**1.0**

PM Peak Hour Total Traffic Flow Validation – East of Scotland – A68

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	North of B6457	N	306	271	-12%	**2.1**
1b		S	481	335	-30%	**7.2**
2a	South of A697	N	200	147	-27%	**4.0**
2b		S	274	214	-22%	**3.9**
3a	South of Lauder	N	219	168	-23%	**3.6**
3b		S	236	182	-23%	**3.7**
4a	South of A699	N	243	219	-10%	**1.6**
4b		S	396	268	-32%	**7.0**
5a	South of A698	N	306	434	42%	**6.6**
5b		S	375	500	33%	**6.0**

AM Peak Hour Total Traffic Flow Validation – East of Scotland – A6091 & A7

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
A6091						
1a	East of A7	E	752	522	-31%	**9.1**
1b		W	496	483	-3%	**0.6**
A7						
1a	South of A6091	N	521	474	-9%	**2.1**
1b		S	360	362	1%	**0.1**
2a	South of Selkirk (B6400)	N	395	550	39%	**7.1**
2b		S	283	362	28%	**4.4**

PM Peak Hour Total Traffic Flow Validation – East of Scotland – A6091 & A7

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
A6091						
1a	East of A7	E	538	612	14%	**3.1**
1b		W	619	680	10%	**2.4**
A7						
1a	South of A6091	N	390	605	55%	**9.6**
1b		S	494	677	37%	**7.6**
2a	South of Selkirk (B6400)	N	248	761	207%	**22.8**
2b		S	399	832	109%	**17.5**

AM Peak & PM Peak Total Modelled Traffic Flow – East of Scotland – A1

Site Number	Location	Direction	Modelled PCU Flow AM Peak	Modelled PCU Flow PM Peak
1a	East of Old Craighall (A720)	E	1,519	2,754
1b		W	2,527	1,834
2a	West of Tranent (A199)	E	1,253	2,230
2b		W	1,913	1,479
3a	West of A198	E	1,046	1,729
3b		W	1,557	1,175
4a	West of B6363	E	824	1,029
4b		W	917	837
5a	West of Haddington	E	886	1,086
5b		W	959	910
6a	East of Haddington	E	456	599
6b		W	597	579

AM Peak Hour Total Traffic Flow Validation – South West of Scotland – A75

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of Gretna	E	439	372	-15%	**3.3**
1b		W	351	304	-13%	**2.6**
2a	West of Annan	E	451	518	15%	**3.1**
2b		W	458	482	5%	**1.1**
3a	South of A709	E	407	562	38%	**7.0**
3b		W	398	579	45%	**8.2**
4a	North of A709	E	498	743	49%	**9.8**
4b		W	530	658	24%	**5.2**
5a	East of Castle Douglas	E	379	159	-58%	**13.4**
5b		W	396	210	-47%	**10.7**
6a	West of Castle Douglas	E	349	261	-25%	**5.0**
6b		W	340	232	-32%	**6.4**
7a	North of Creetown	E	185	122	-34%	**5.1**
7b		W	155	90	-42%	**5.9**
8a	East of Newton Stewart	E	195	253	30%	**3.9**
8b		W	181	193	6%	**0.9**
9a	West of Newton Stewart	E	147	140	-5%	**0.6**
9b		W	188	105	-44%	**6.9**
10a	West of A747	E	133	215	62%	**6.2**
10b		W	237	184	-22%	**3.7**

PM Peak Hour Total Traffic Flow Validation – South West of Scotland – A75

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of Gretna	E	420	263	-37%	**8.5**
1b		W	517	326	-37%	**9.3**
2a	West of Annan	E	454	521	15%	**3.0**
2b		W	515	525	2%	**0.4**
3a	South of A709	E	430	567	32%	**6.1**
3b		W	448	602	34%	**6.7**
4a	North of A709	E	596	565	-5%	**1.3**
4b		W	670	846	26%	**6.4**
5a	East of Castle Douglas	E	364	235	-36%	**7.5**
5b		W	461	235	-49%	**12.1**
6a	West of Castle Douglas	E	324	337	4%	**0.7**
6b		W	439	368	-16%	**3.6**
7a	North of Creetown	E	206	152	-26%	**4.0**
7b		W	157	150	-4%	**0.5**
8a	East of Newton Stewart	E	221	307	39%	**5.3**
8b		W	169	364	116%	**12.0**
9a	West of Newton Stewart	E	136	155	14%	**1.6**
9b		W	178	183	3%	**0.4**
10a	West of A747	E	182	315	73%	**8.4**
10b		W	168	333	98%	**10.4**

AM Peak Hour Total Traffic Flow Validation – South West of Scotland – A77

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	Southeast of Kilmarnock	N	76	106	40%	**3.2**
b		S	122	64	-48%	**6.0**
2a	North of B741	N	287	574	100%	**13.8**
b		S	314	396	26%	**4.4**
3a	South of Maybole	N	221	570	158%	**17.5**
b		S	277	396	43%	**6.5**
4a	East of B7024	N	364	430	18%	**3.3**
5a	East of B7038	N	919	896	-3%	**0.8**

PM Peak Hour Total Traffic Flow Validation – South West of Scotland – A77

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	Southeast of Kilmarnock	N	85	65	-24%	**2.4**
b		S	110	108	-2%	**0.2**
2a	North of B741	N	247	461	87%	**11.4**
b		S	361	573	59%	**9.8**
3a	South of Maybole	N	218	461	112%	**13.2**
b		S	290	517	78%	**11.3**
4a	East of B7024	N	307	621	102%	**14.6**
5a	East of B7038	N	1016	953	-6%	**2.0**

AM Peak Hour Total Traffic Flow Validation – South West of Scotland – A76

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	Southeast of Kilmarnock	N	609	781	28%	**6.5**
b		S	444	490	10%	**2.1**
2a	South of A719	N	531	695	31%	**6.6**
b		S	406	409	1%	**0.1**
3a	South of B744	N	423	443	5%	**0.9**
b		S	545	738	35%	**7.6**
4a	South of Mauchline	N	587	564	-4%	**0.9**
b		S	576	390	-32%	**8.4**
5a	West of B7083	N	246	324	32%	**4.6**
b		S	266	216	-19%	**3.2**
6a	West of Mansfield	N	252	482	91%	**12.0**
b		S	208	297	43%	**5.6**
7a	North of A702	N	117	243	108%	**9.4**
b		S	141	167	18%	**2.1**
8a	North of Holywood	N	224	311	39%	**5.3**
b		S	378	316	-16%	**3.3**

PM Peak Hour Total Traffic Flow Validation – South West of Scotland – A76

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	Southeast of Kilmarnock	N	435	557	28%	**5.5**
b		S	611	696	14%	**3.3**
2a	South of A719	N	384	450	17%	**3.2**
b		S	531	596	12%	**2.8**
3a	South of B744	N	550	676	23%	**5.1**
b		S	2250	2090	-7%	**3.4**
4a	South of Mauchline	N	447	415	-7%	**1.6**
b		S	632	514	-19%	**4.9**
5a	West of B7083	N	296	238	-20%	**3.5**
b		S	224	226	1%	**0.2**
6a	West of Mansfield	N	220	364	65%	**8.4**
b		S	322	341	6%	**1.1**
7a	North of A702	N	153	217	42%	**4.7**
b		S	112	176	57%	**5.3**
8a	North of Holywood	N	347	290	-16%	**3.2**
b		S	200	208	4%	**0.6**

AM Peak Hour Total Traffic Flow Validation – South West of Scotland – A8 and A726

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
A8						
1a	West of Newhouse	E	2924	2391	-18%	**10.3**
b		W	2473	2343	-5%	**2.7**
2a	West of Chapelhall	E	3108	2912	-6%	**3.6**
b		W	2419	2340	-3%	**1.6**
3a	West of Chapelhall	W	3721	3631	-2%	**1.48**
4a	East of Ballieston	E	3300	2704	-18%	**10.9**
4b		W	3189	2675	-16%	**9.5**
A726						
1a	East of M77	N	1538	663	-57%	**26.4**
b		S	1412	1089	-23%	**9.1**

PM Peak Hour Total Traffic Flow Validation – South West of Scotland – A8 and A726

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
A8						
1a	West of Newhouse	E	2735	2259	-17%	**9.5**
b		W	3023	2369	-22%	**12.6**
2a	West of Chapelhall	E	3135	3054	-3%	**1.5**
b		W	2903	2363	-19%	**10.5**
3a		W	3767	3759	0%	**0.13**
4a	East of Ballieston	E	3317	2851	-14%	**8.4**
4b		W	3140	2656	-15%	**9.0**
A726						
1a	East of M77	N	1654	932	-44%	**20.1**
b		S	1578	1247	-21%	**8.8**

AM Peak Hour Total Traffic Flow Validation – North East of Scotland – A90

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	Kingsway West of A923	E	1413	1847	31%	**10.7**
b		W	1764	1844	5%	**1.9**
2b	Kingsway East of A923	W	1503	1615	7%	**2.8**
3b		W	1195	1663	39%	**12.4**
4a	Kingsway West of A92	E	1018	1131	11%	**3.5**
b		W	1224	1170	-4%	**1.6**
7a	Bridge of Dee	E	1449	1864	29%	**10.2**
b		W	1232	1456	18%	**6.1**
8a	Pearsley bridge	E	942	403	-57%	**20.8**
b		W	837	1119	34%	**9.0**
9b	Parkway West of B997	W	628	556	-11%	**3.0**
10a	North of A9005	E	295	335	14%	**2.3**
b		W	526	680	29%	**6.3**

PM Peak Hour Total Traffic Flow Validation – North East of Scotland – A90

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	Kingsway West of A923	E	1528	1915	25%	**9.3**
b		W	1493	1991	33%	**11.9**
2b	Kingsway East of A923	W	1607	1885	17%	**6.7**
3b		W	1276	1951	53%	**16.8**
4a	Kingsway West of A92	E	1096	1192	9%	**2.8**
b		W	1099	1200	9%	**3.0**
7a	Bridge of Dee	E	1259	1760	40%	**12.9**
b		W	1387	1876	35%	**12.1**
8a	Pearsley bridge	E	1403	1066	-24%	**9.6**
b		W	1091	638	-42%	**15.4**
9b	Parkway West of B997	W	553	812	47%	**9.9**
10a	North of A9005	E	744	673	-10%	**2.7**
b		W	354	397	12%	**2.2**

AM Peak Hour Total Traffic Flow Validation – North East of Scotland – A96

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of B9006	E	745	656	-12%	**3.4**
b		W	376	509	35%	**6.3**
2a	East of B9092	E	394	422	7%	**1.4**
b		W	694	579	-17%	**4.6**
3a	East of Nairn	E	317	304	-4%	**0.7**
b		W	422	288	-32%	**7.1**
4b	West of Elgin	W	728	585	-20%	**5.6**
5a	East of A941	E	615	478	-22%	**5.9**
b		W	745	870	17%	**4.4**
6a	West of B9015	E	554	565	2%	**0.5**
b		W	758	911	20%	**5.3**
7a	South of A97	E	334	539	61%	**9.8**
b		W	278	340	22%	**3.5**
8a	South of Inverdruie	E	1464	1234	-16%	**6.3**
b		W	868	633	-27%	**8.6**

PM Peak Hour Total Traffic Flow Validation – North East of Scotland – A96

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of B9006	E	745	656	-12%	**3.4**
b		W	376	509	35%	**6.3**
2a	East of B9092	E	394	422	7%	**1.4**
b		W	694	579	-17%	**4.6**
3a	East of Nairn	E	317	304	-4%	**0.7**
b		W	422	288	-32%	**7.1**
4b	West of Elgin	W	728	585	-20%	**5.6**
5a	East of A941	E	615	478	-22%	**5.9**
b		W	745	870	17%	**4.4**
6a	West of B9015	E	554	565	2%	**0.5**
b		W	758	911	20%	**5.3**
7a	South of A97	E	334	539	61%	**9.8**
b		W	278	340	22%	**3.5**
8a	South of Inverdruie	E	1464	1234	-16%	**6.3**
b		W	868	633	-27%	**8.6**

AM Peak Hour Total Traffic Flow Validation – North East of Scotland – A95 and A985

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of A939	E	190	128	-33%	**4.9**
b		W	230	198	-14%	**2.2**
2a	East of A939	E	82	33	-59%	**6.4**
b		W	104	19	-82%	**10.9**
3a	West of A96	E	68	84	23%	**1.8**
b		W	94	86	-9%	**0.9**
A985						
1a	West of A994	E	561	776	38%	**8.3**
b		W	535	766	43%	**9.1**
2a	East of B9156	E	687	485	-29%	**8.3**

PM Peak Hour Total Traffic Flow Validation – North East of Scotland – A95 and A985

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of A939	E	263	204	-22%	**3.9**
b		W	265	245	-8%	**1.3**
2a	East of A939	E	133	29	-78%	**11.5**
b		W	114	31	-73%	**9.7**
3a	West of A96	E	113	179	58%	**5.4**
b		W	82	168	105%	**7.7**
A985						
1a	West of A994	E	558	777	39%	**8.5**
b		W	498	609	22%	**4.7**
2a	East of B9156	E	570	422	-26%	**6.7**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A835 and A87

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	South of A832 (Corriemollie)	E	67	119	78%	**5.4**
b		W	92	88	-5%	**0.5**
2a	South of A834	E	150	117	-22%	**2.8**
b		W	163	88	-46%	**6.7**
3a	East of A832 (Marybank)	E	376	501	33%	**6.0**
b		W	535	382	-29%	**7.1**
4a	West of A9	E	450	501	11%	**2.3**
b		W	470	382	-19%	**4.3**
A87						
1a	West of A828	E	100	113	13%	**1.3**
b		W	125	64	-49%	**6.3**
2a	West of A887	E	37	63	70%	**3.7**
b		W	40	33	-17%	**1.2**
3a	South of A887	E	17	37	120%	**3.9**
b		W	15	21	41%	**1.4**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A835 and A87

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	South of A832 (Corriemollie)	E	115	80	-30%	**3.5**
b		W	99	139	40%	**3.6**
2a	South of A834	E	191	80	-58%	**9.5**
b		W	205	137	-33%	**5.2**
3a	East of A832 (Marybank)	E	547	291	-47%	**12.5**
b		W	533	480	-10%	**2.4**
4a	West of A9	E	594	291	-51%	**14.4**
b		W	463	480	4%	**0.8**
A87						
1a	West of A828	E	174	85	-51%	**7.8**
b		W	151	99	-35%	**4.7**
2a	West of A887	E	79	41	-49%	**5.0**
b		W	74	50	-33%	**3.1**
3a	South of A887	E	41	28	-32%	**2.2**
b		W	41	32	-22%	**1.5**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A85

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of A828	E	235	166	-30%	**4.9**
b		W	441	228	-48%	**11.6**
2a	East of A828	E	132	69	-47%	**6.2**
b		W	182	67	-63%	**10.3**
3a	West of A82	E	48	71	48%	**3.0**
b		W	64	70	9%	**0.7**
4a	East of A82	E	50	74	48%	**3.0**
b		W	98	51	-48%	**5.5**
5a	East of A827	E	83	63	-24%	**2.4**
b		W	118	40	-66%	**8.8**
6a	East of A84	E	49	11	-78%	**6.9**
b		W	76	17	-78%	**8.6**
7a	East of B827	E	120	12	-90%	**13.4**
b		W	109	17	-85%	**11.7**
8a	South West of Gilmerton	E	247	289	17%	**2.6**
b		W	242	273	13%	**1.9**
9a	West of Perth	E	420	506	20%	**4.0**
b		W	258	489	90%	**12.0**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A85

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	West of A828	E	430	294	-32%	**7.1**
b		W	321	234	-27%	**5.2**
2a	East of A828	E	187	68	-63%	**10.5**
b		W	169	62	-63%	**10.0**
3a	West of A82	E	83	83	0%	**0.0**
b		W	84	81	-4%	**0.4**
4a	East of A82	E	132	65	-51%	**6.8**
b		W	115	93	-19%	**2.1**
5a	East of A827	E	161	60	-63%	**9.6**
b		W	145	82	-43%	**5.9**
6a	East of A84	E	80	12	-85%	**10.0**
b		W	92	11	-88%	**11.3**
7a	East of B827	E	108	13	-88%	**12.2**
b		W	155	12	-92%	**15.7**
8a	South West of Gilmerton	E	223	250	12%	**1.8**
b		W	295	317	8%	**1.3**
9a	West of Perth	E	244	433	78%	**10.3**
b		W	416	483	16%	**3.2**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A83

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	South of Invernell	E	89	43	-52%	**5.7**
b		W	77	19	-76%	**8.4**
2a	East of Lochgilphead	E	401	213	-47%	**10.7**
b		W	199	177	-11%	**1.6**
3a	East of A819	E	88	60	-31%	**3.2**
b		W	149	72	-52%	**7.3**
4a	Clachan	E	98	101	3%	**0.3**
b		W	110	106	-4%	**0.4**
5a	West of B838	E	126	92	-27%	**3.3**
b		W	138	113	-18%	**2.2**
6a	East of B838	E	116	91	-22%	**2.5**
b		W	112	128	15%	**1.5**
A84						
1a	South of A85	N	93	25	-74%	**8.9**
b		S	79	53	-33%	**3.2**
2a	South of A85	N	219	170	-22%	**3.5**
b		S	279	344	23%	**3.7**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A83

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	South of Invernell	E	86	36	-58%	**6.3**
b		W	106	41	-61%	**7.6**
2a	East of Lochgilphead	E	215	304	41%	**5.5**
b		W	413	357	-13%	**2.8**
3a	East of A819	E	122	59	-52%	**6.7**
b		W	122	78	-36%	**4.4**
4a	Clachan	E	143	130	-9%	**1.1**
b		W	141	154	9%	**1.1**
5a	West of B838	E	188	151	-20%	**2.8**
b		W	204	127	-38%	**5.9**
6a	East of B838	E	141	162	15%	**1.7**
b		W	176	129	-27%	**3.8**
A84						
1a	South of A85	N	130	73	-44%	**5.7**
b		S	139	49	-64%	**9.2**
2a	South of A85	N	320	338	6%	**1.0**
b		S	246	279	13%	**2.0**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A82

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	North of Balloch	N	767	620	-19%	**5.6**
b		S	829	696	-16%	**4.8**
2a	North of Glen Fruin Road	N	207	197	-5%	**0.7**
b		S	156	247	59%	**6.4**
3a	North of A85	N	69	86	24%	**1.9**
b		S	41	116	183%	**8.5**
4a	East of Ballachulish	N	111	86	-23%	**2.5**
b		S	117	116	-1%	**0.1**
5a	South of Fort William	N	227	112	-51%	**8.9**
b		S	160	139	-13%	**1.7**
6a	North of Spean Bridge	N	100	106	6%	**0.6**
b		S	99	145	46%	**4.1**
7a	North of A87	N	69	85	23%	**1.8**
b		S	101	107	6%	**0.6**
8a	West of Inverness	N	294	318	8%	**1.4**
b		S	224	106	-53%	**9.2**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A82

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	North of Balloch	N	971	720	-26%	**8.6**
b		S	871	759	-13%	**3.9**
2a	North of Glen Fruin Road	N	246	213	-13%	**2.2**
b		S	252	251	0%	**0.0**
3a	North of A85	N	112	73	-35%	**4.1**
b		S	112	118	6%	**0.6**
4a	East of Ballachulish	N	192	73	-62%	**10.4**
b		S	185	118	-36%	**5.4**
5a	South of Fort William	N	225	95	-58%	**10.2**
b		S	293	142	-52%	**10.3**
6a	North of Spean Bridge	N	138	144	4%	**0.5**
b		S	166	154	-7%	**0.9**
7a	North of A87	N	105	112	7%	**0.7**
b		S	110	126	15%	**1.5**
8a	West of Inverness	N	234	213	-9%	**1.4**
b		S	316	265	-16%	**3.0**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A9 Caithness to Inverness

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	South of Helmsdale	N	95	153	61%	**5.2**
b		S	84	134	59%	**4.8**
2a	South of Brora	N	153	175	15%	**1.8**
b		S	173	178	3%	**0.4**
3a	South of A839	N	166	177	7%	**0.8**
b		S	175	192	9%	**1.2**
4a	South of A949	N	200	165	-18%	**2.6**
b		S	226	162	-28%	**4.6**
5a	North of A862	N	591	649	10%	**2.3**
b		S	668	767	15%	**3.7**
6a	North of A835	N	367	421	15%	**2.7**
b		S	515	545	6%	**1.3**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A9 Caithness to Inverness

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
1a	South of Helmsdale	N	95	187	97%	**7.8**
b		S	115	220	92%	**8.1**
2a	South of Brora	N	201	247	23%	**3.1**
b		S	156	257	65%	**7.0**
3a	South of A839	N	186	261	40%	**5.0**
b		S	201	252	25%	**3.4**
4a	South of A949	N	233	199	-15%	**2.3**
b		S	280	192	-32%	**5.8**
5a	North of A862	N	860	770	-10%	**3.1**
b		S	654	551	-16%	**4.2**
6a	North of A835	N	644	465	-28%	**7.6**
b		S	431	260	-40%	**9.2**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A9 Inverness to Perth

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
7a	North of B9851	N	570	568	0%	**0.1**
b		S	338	321	-5%	**0.9**
8a	South of A938	N	249	386	55%	**7.7**
b		S	200	233	16%	**2.2**
9a	North of A924	N	303	396	31%	**5.0**
b		S	216	383	77%	**9.6**
10a	South of A827	N	426	523	23%	**4.5**
b		S	332	450	36%	**6.0**
11b	South of B9099	S	562	946	68%	**14.0**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A9 Inverness to Perth

Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
7a	North of B9851	N	427	493	15%	**3.1**
b		S	505	447	-11%	**2.7**
8a	South of A938	N	280	376	34%	**5.3**
b		S	277	272	-2%	**0.3**
9a	North of A924	N	330	518	57%	**9.1**
b		S	428	426	0%	**0.1**
10a	South of A827	N	418	621	49%	**8.9**
b		S	571	586	3%	**0.6**
11b	South of B9099	S	1128	890	-21%	**7.5**

AM Peak Hour Total Traffic Flow Validation – North West of Scotland – A9 Perth to Stirling

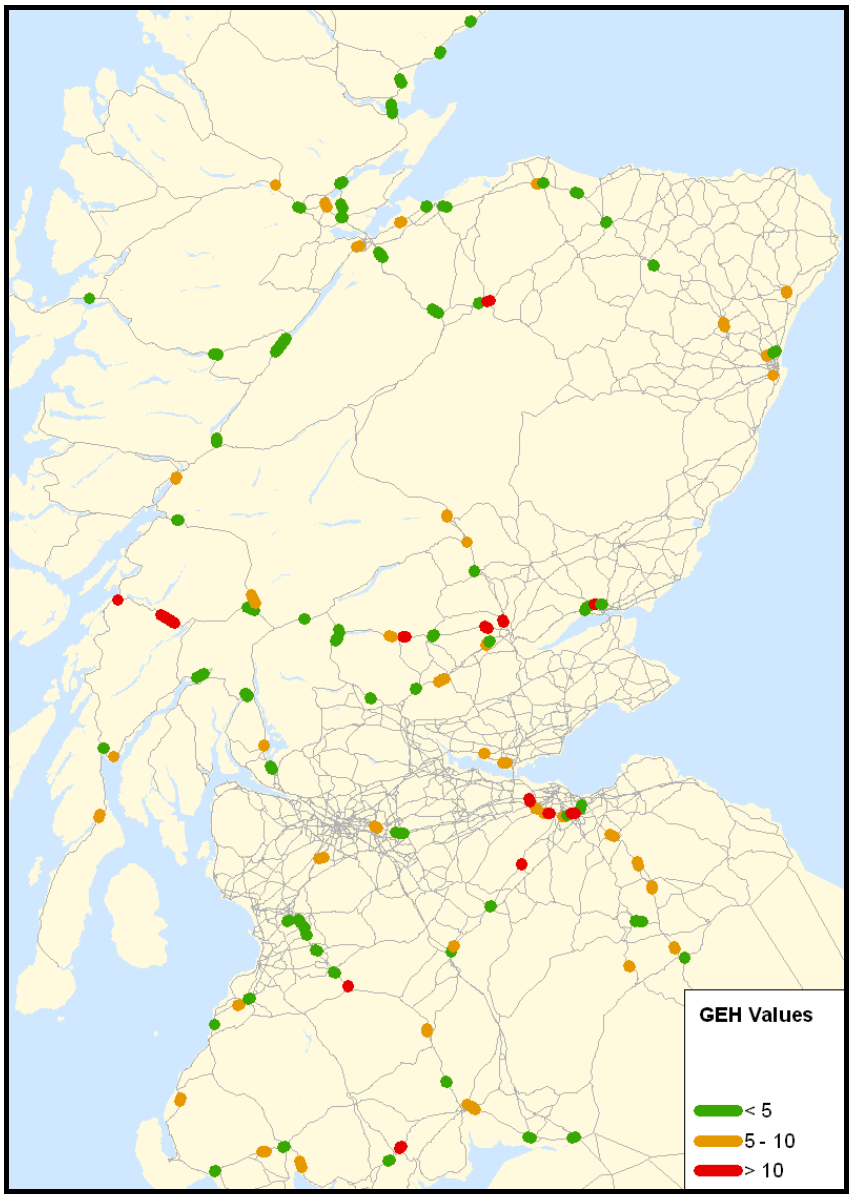
Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
12a	North of B934	N	1339	1160	-13%	**5.1**
b		S	919	844	-8%	**2.5**
13a	South of A823	N	1170	1009	-14%	**4.9**
b		S	946	733	-23%	**7.4**
14a	South of A822	N	1148	1087	-5%	**1.8**
b		S	1072	994	-7%	**2.4**

PM Peak Hour Total Traffic Flow Validation – North West of Scotland – A9 Perth to Stirling

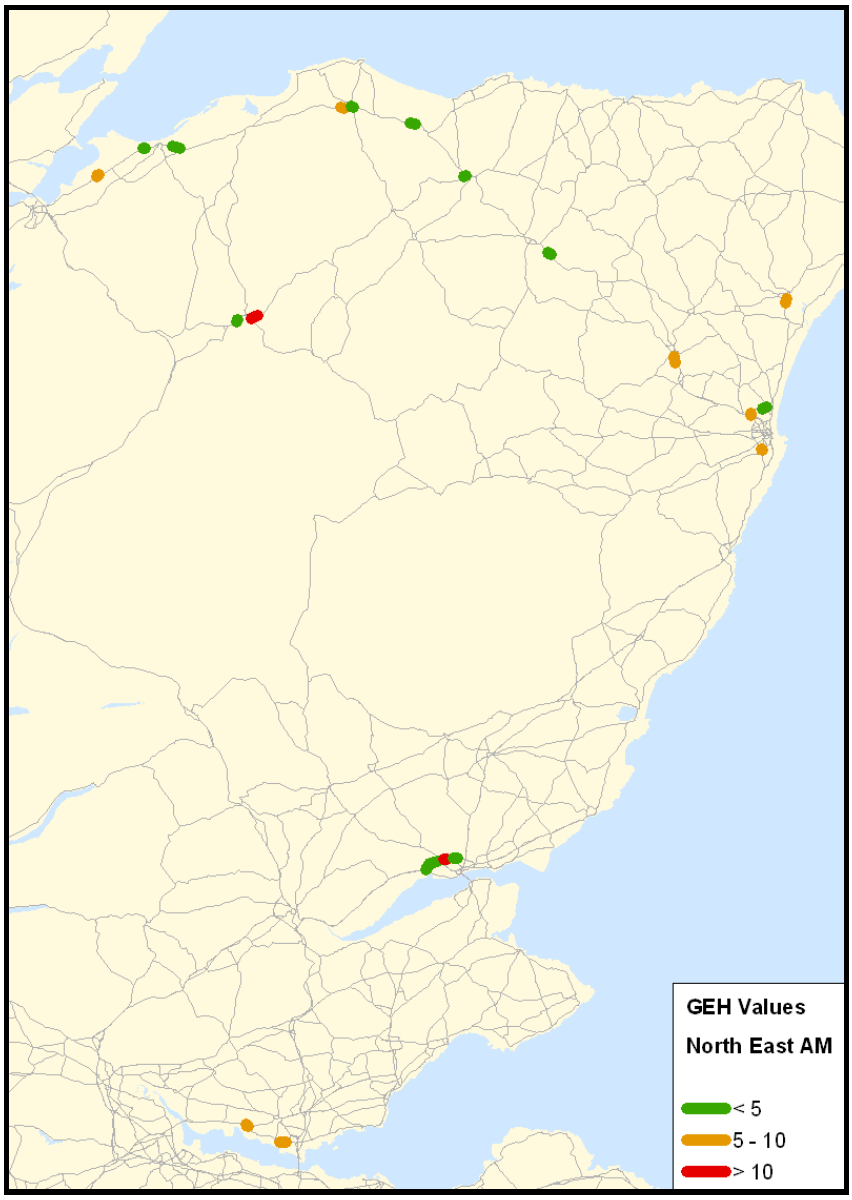
Site Number	Location	Direction	Observed PCU Count	Modelled PCU Flow	% Change	GEH
12a	North of B934	N	1136	981	-14%	**4.8**
b		S	905	1231	36%	**10.0**
13a	South of A823	N	1078	883	-18%	**6.2**
b		S	1214	942	-22%	**8.3**
14a	South of A822	N	1244	1007	-19%	**7.1**
b		S	1169	1030	-12%	**4.2**

Appendix I – Link Count Validation Sites (Total PCUs)

Total PCU Validation Sites AM Peak, National, Trunk A-Roads



Total PCU Validation Sites AM Peak, North East, Trunk A-Roads



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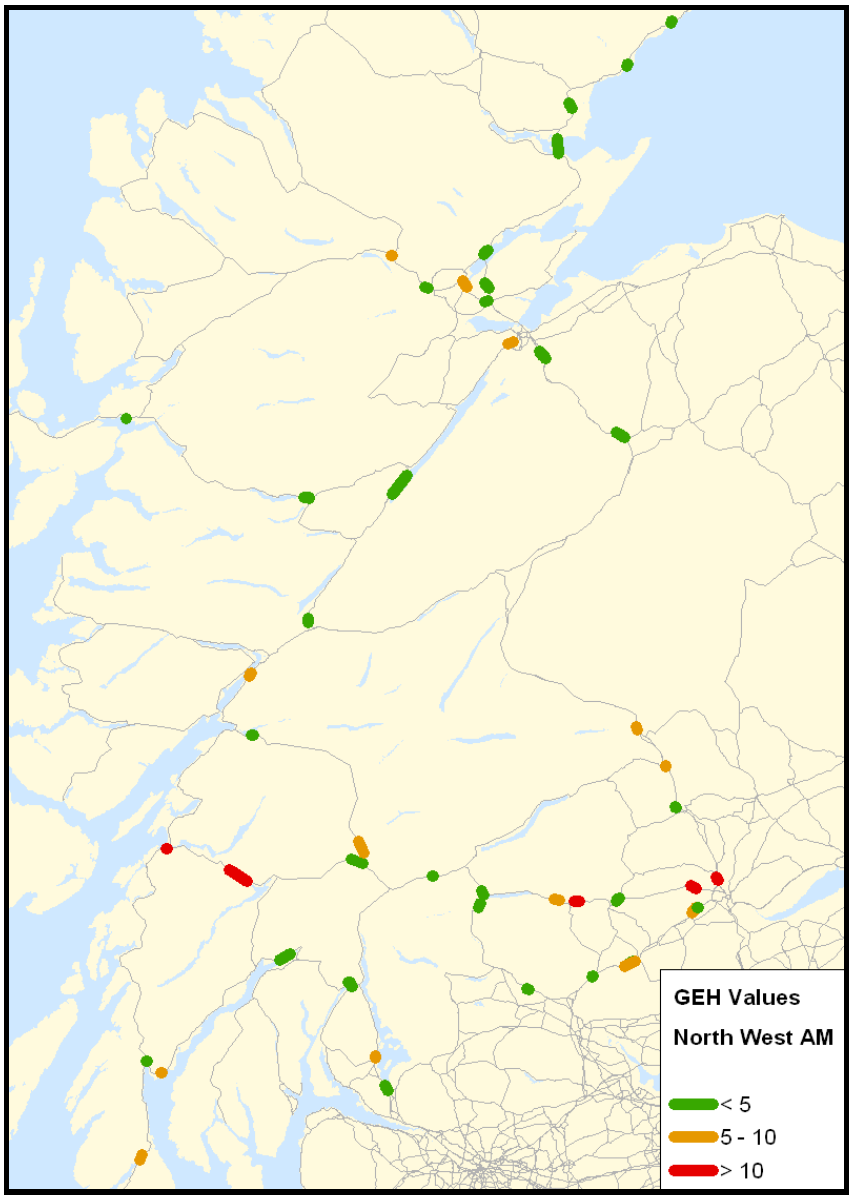

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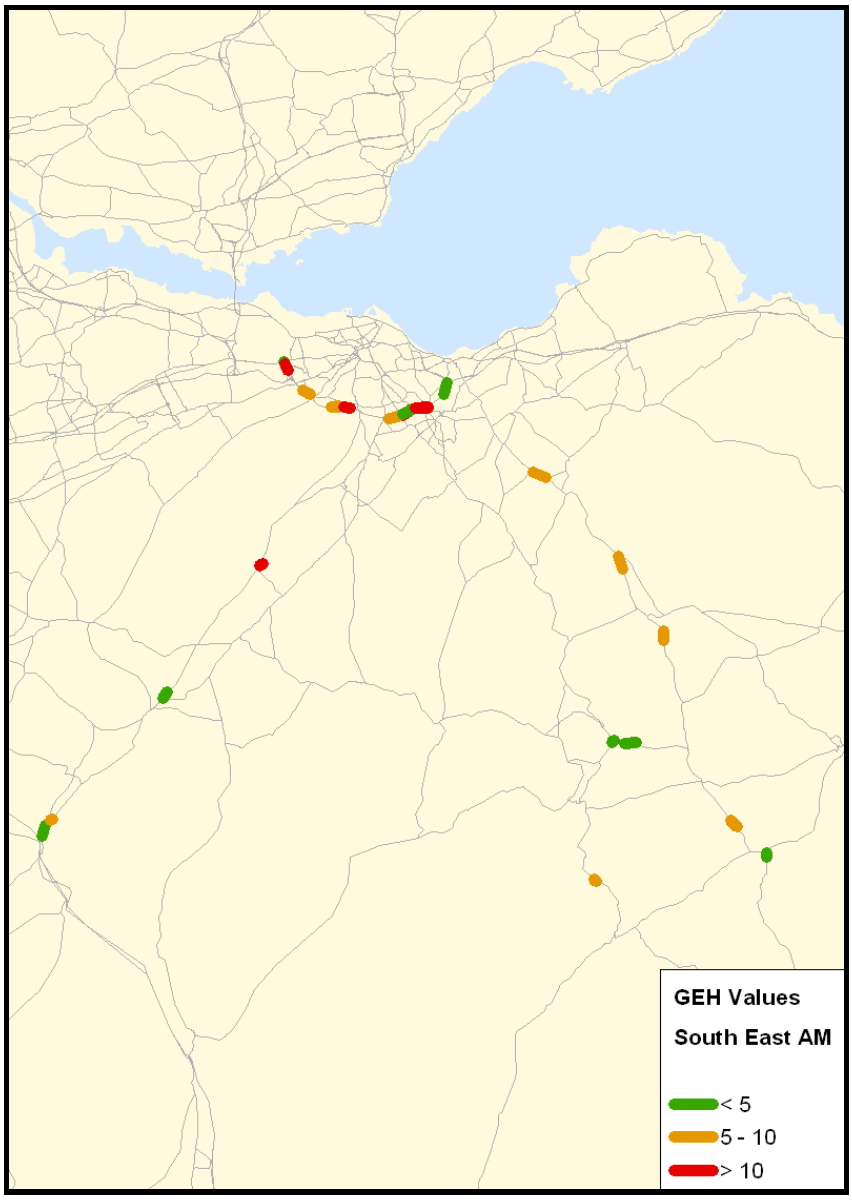

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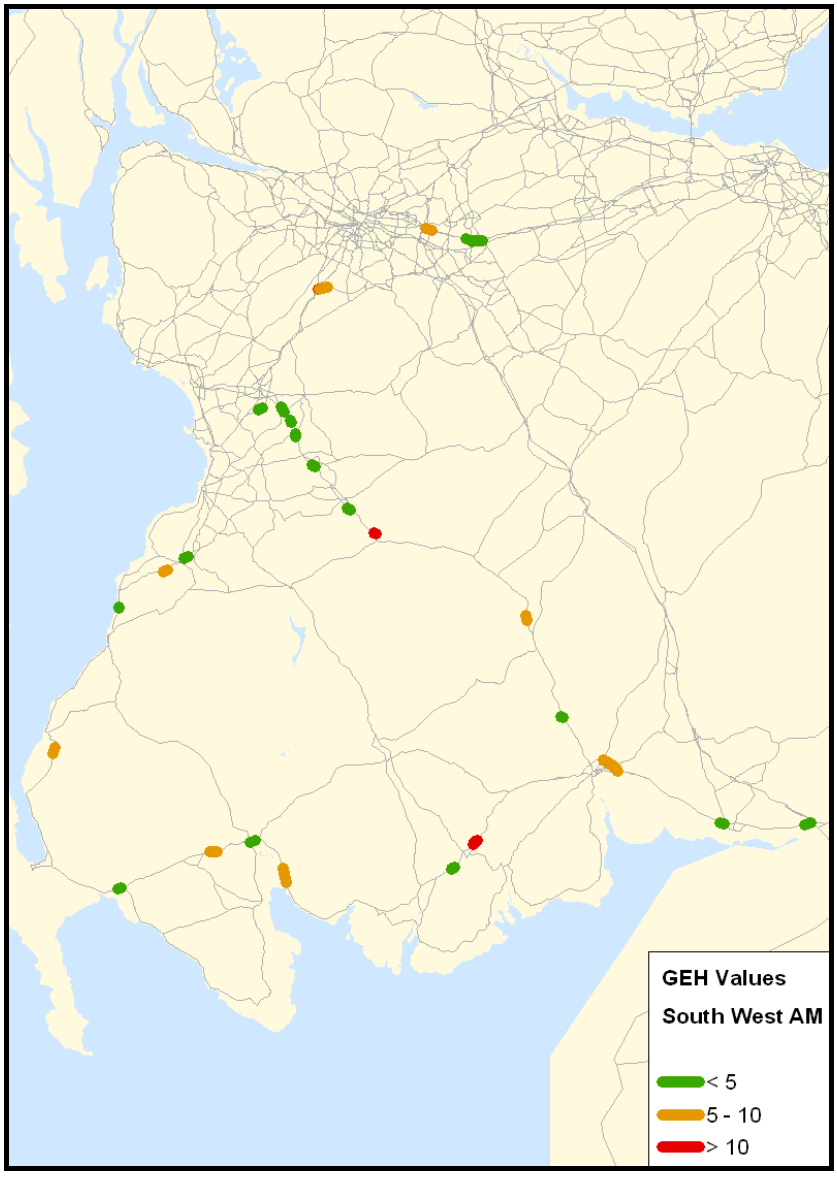

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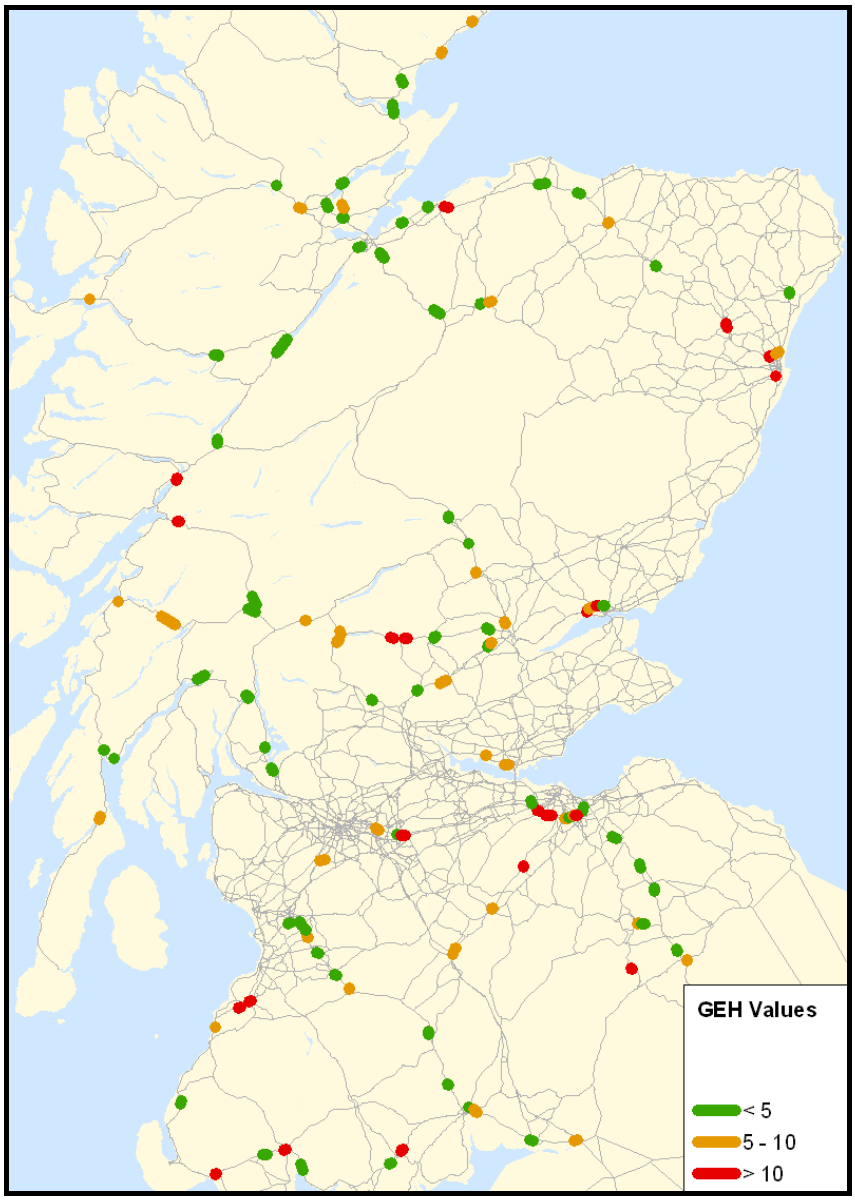

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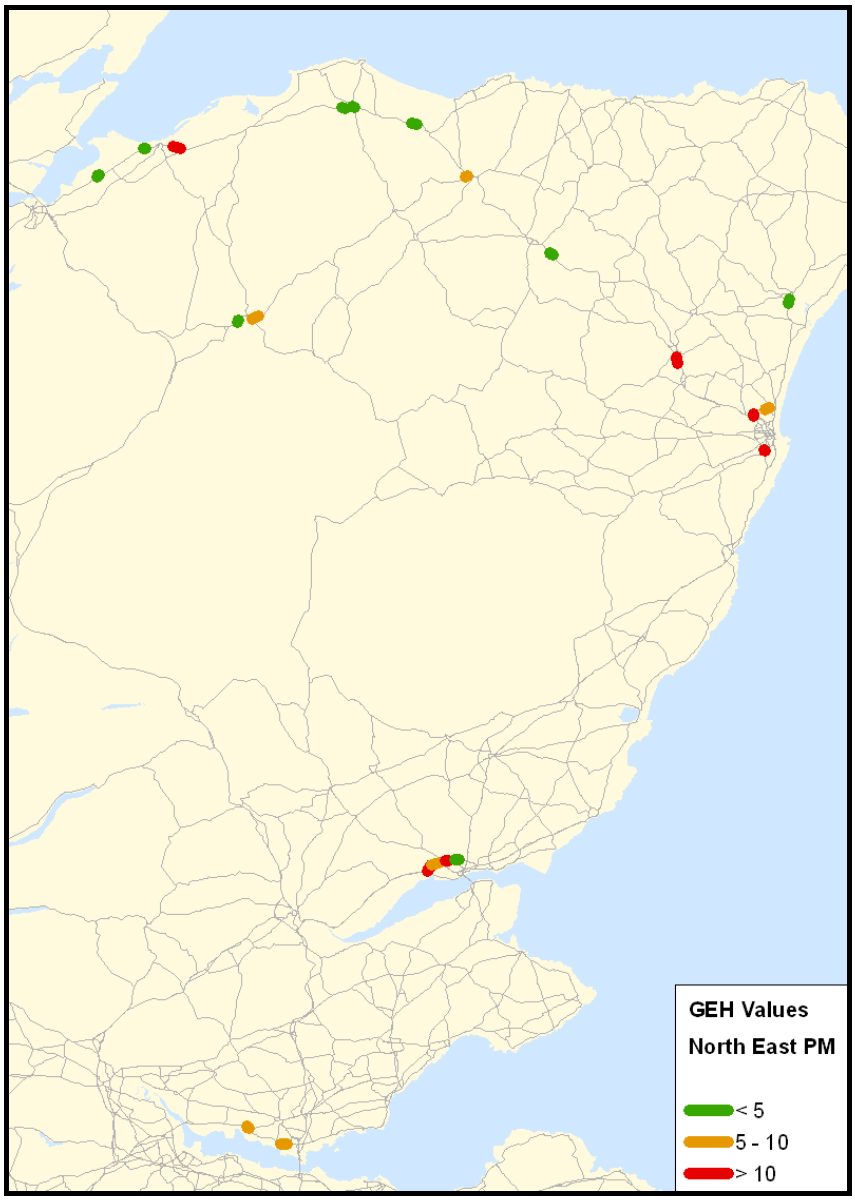

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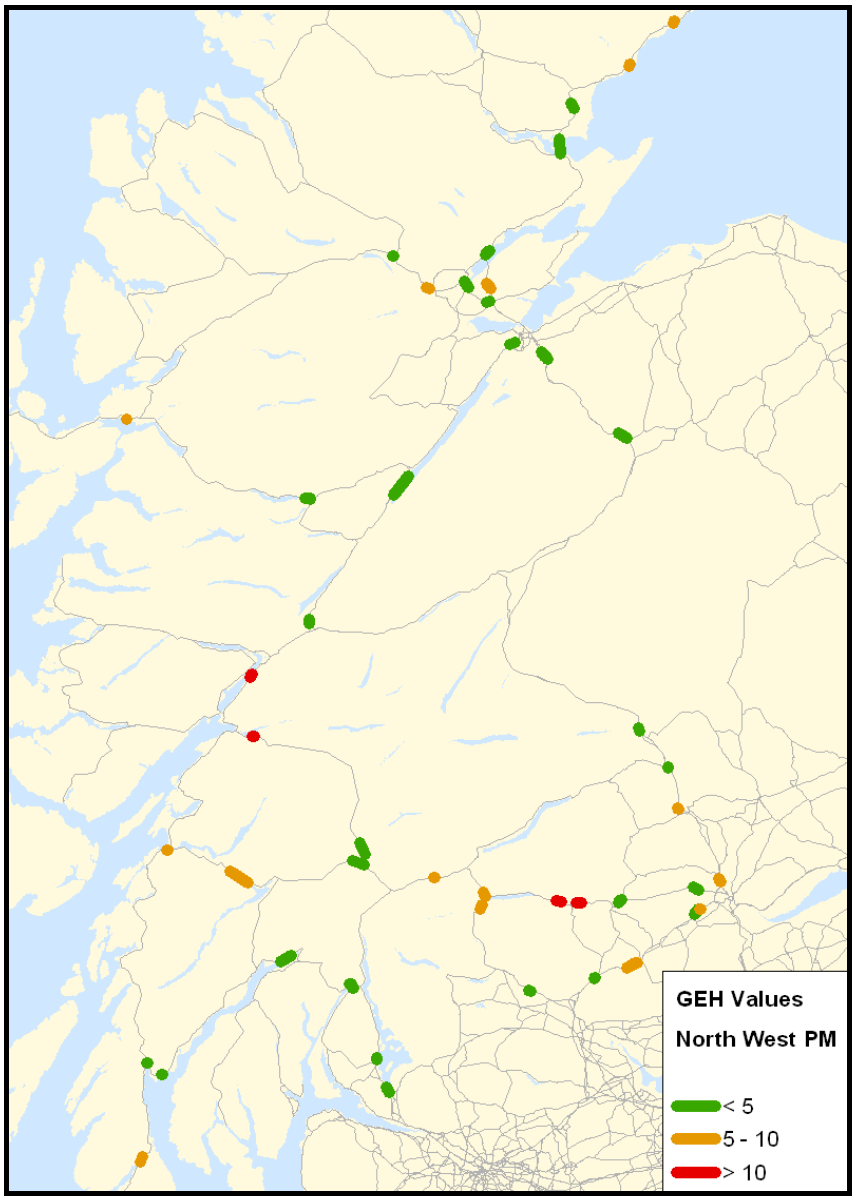

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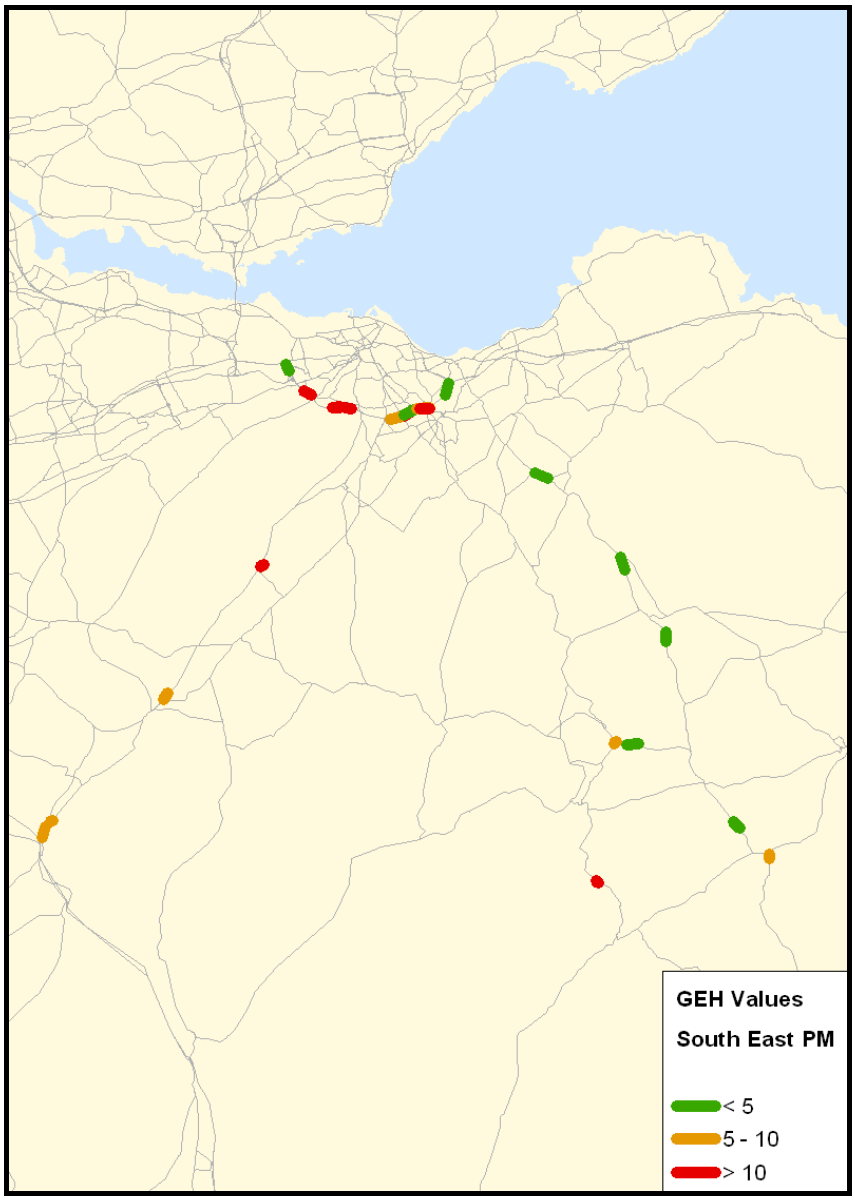
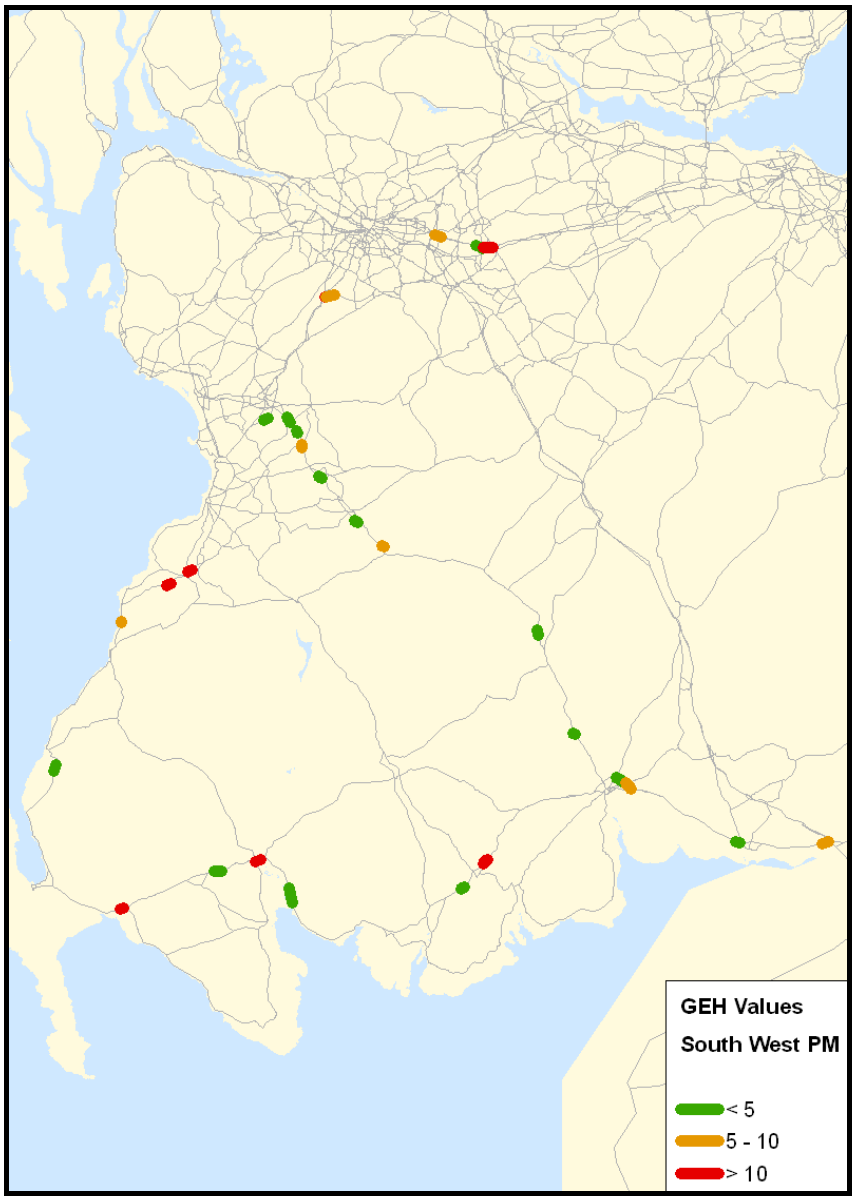
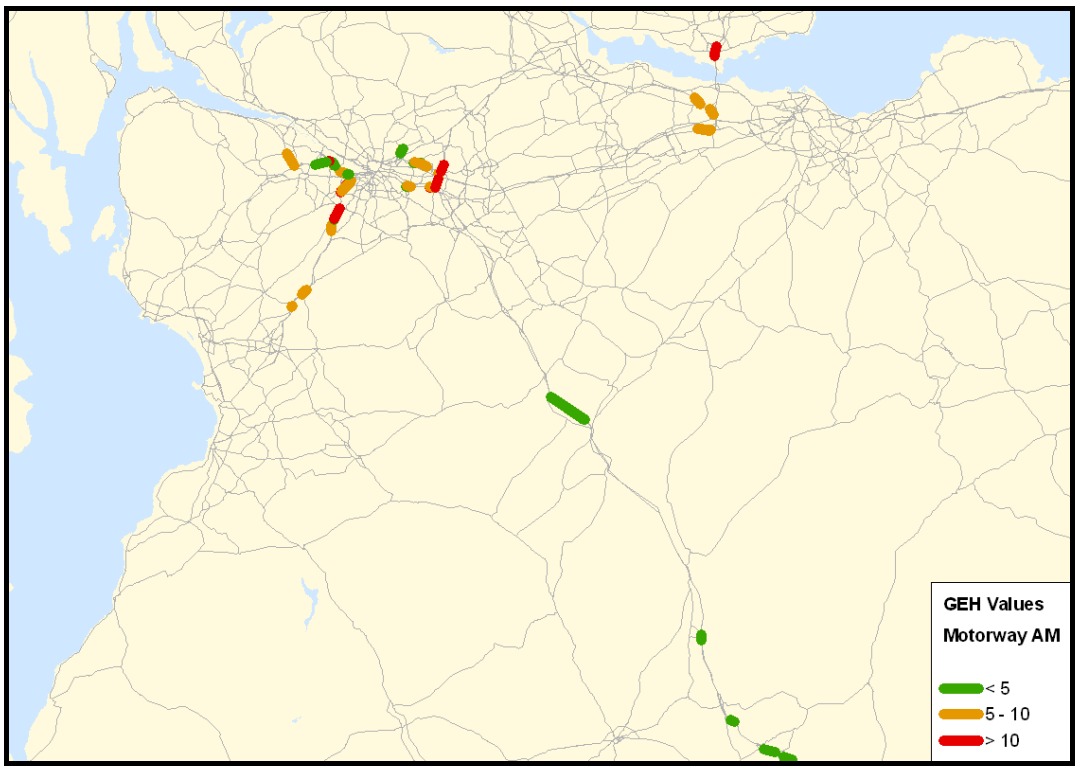


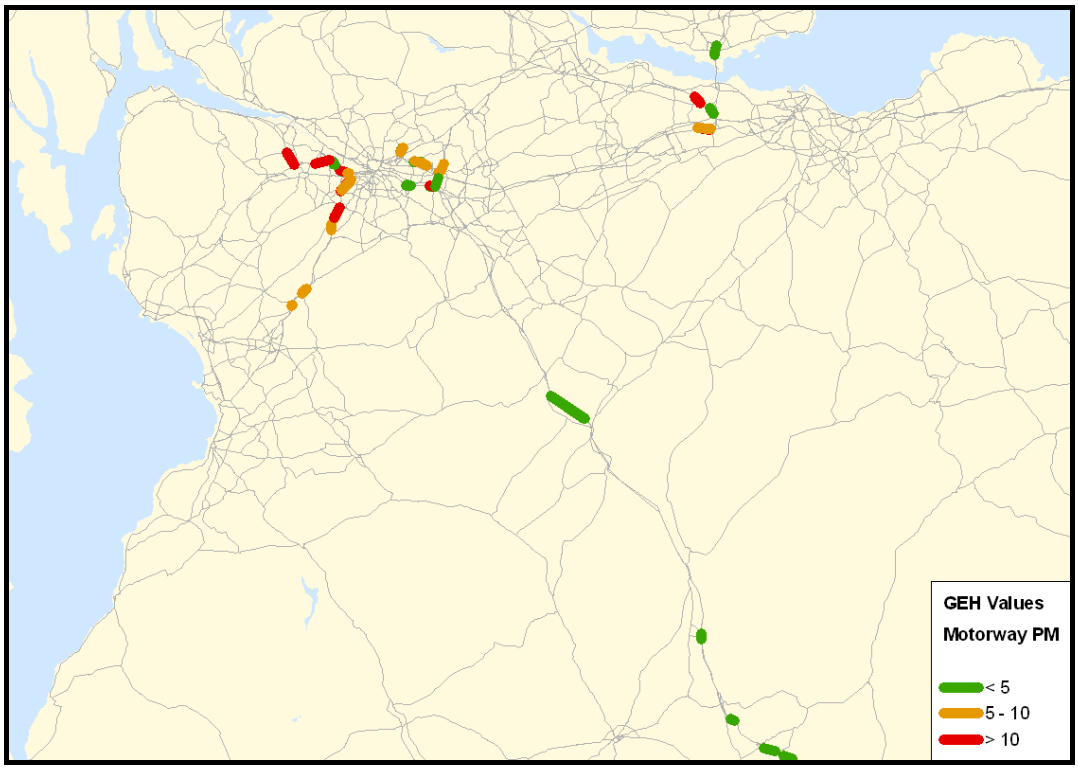
Total PCU Validation Sites PM Peak, South West, Trunk A-Roads



Total PCU Validation Sites, AM Peak, Motorways



Total PCU Validation Sites, PM Peak, Motorways



Appendix J – HGV Validation

AM Peak Hour HGV Validation – SRTDb Sites on Motorways and A-Roads Only

Screenline Number	Screenline Area	Road	Direction	Observed HGV (Vehicles)	TMfS.07 Road Model HGV Flow (Vehicles)	Difference (vehicles)	GEH
3	ABERDEEN	A90	NB	83	156	73	6.7
301	ABERDEEN	A90	SB	59	52	-8	1.1
74	ABERDEEN	A90	NB	22	29	7	1.3
7401	ABERDEEN	A90	SB	22	55	33	5.3
25	CENTRAL & TAYSIDE	A80	NB	196	181	-16	1.1
2501	CENTRAL & TAYSIDE	A80	SB	111	267	156	11.4
27	CENTRAL & TAYSIDE	A9 (North of Perth)	SB	27	42	15	2.5
2701	CENTRAL & TAYSIDE	A9 (North of Perth)	NB	38	86	48	6.1
59	CENTRAL & TAYSIDE	A9 (South of Perth)	NB	106	159	53	4.6
5901	CENTRAL & TAYSIDE	A9 (South of Perth)	SB	69	74	5	0.6
41	CENTRAL & TAYSIDE	M8	EB	124	297	173	11.9
4101	CENTRAL & TAYSIDE	M8	WB	117	218	101	7.8
61	CENTRAL & TAYSIDE	M90	NB	118	97	-22	2.1
6101	CENTRAL & TAYSIDE	M90	SB	76	81	4	0.5
10	EDINBURGH	A1	EB	73	170	97	8.8
1001	EDINBURGH	A1	WB	62	83	21	2.5
11	EDINBURGH	A720	EB	112	321	209	14.2
1101	EDINBURGH	A720	WB	123	202	79	6.2
8	EDINBURGH	A8	EB	71	319	248	17.8
801	EDINBURGH	A8	WB	383	141	-241	14.9
12	EDINBURGH	A876 - Kincardine Bridge	NB	64	144	79	7.8
1201	EDINBURGH	A876 - Kincardine Bridge	SB	40	113	73	8.3
67	EDINBURGH	A92	NB	61	266	206	16.1
6701	EDINBURGH	A92	SB	47	136	89	9.3
13	EDINBURGH	A985	EB	6	34	28	6.1
1301	EDINBURGH	A985	WB	25	37	12	2.2
8	EDINBURGH	M8	EB	119	152	32	2.8
801	EDINBURGH	M8	WB	115	104	-11	1.0
14	EDINBURGH	M90	NB	123	73	-50	5.0
1401	EDINBURGH	M90	SB	93	46	-47	5.6
62	GLASGOW	A736	NB	46	24	-22	3.8
6202	GLASGOW	A736	SB	77	73	-4	0.5
64	GLASGOW	A739	NB	31	250	219	18.5
6401	GLASGOW	A739	SB	19	152	133	14.4
7501	GLASGOW	A749	NB	12	28	16	3.6
21	GLASGOW	A761	EB	5	83	78	11.8
2101	GLASGOW	A761	WB	7	89	81	11.7
63	GLASGOW	A77	NB	2	5	3	1.5
6301	GLASGOW	A77	SB	2	62	60	10.7
16	GLASGOW	A814	EB	72	124	52	5.3
1601	GLASGOW	A814	WB	57	114	57	6.1
63	GLASGOW	B769	NB	2	40	38	8.3
6301	GLASGOW	B769	SB	2	22	20	5.9
19	GLASGOW	M74	EB	105	152	48	4.2
1901	GLASGOW	M74	WB	105	170	65	5.6
20	GLASGOW	M77	NB	97	32	-66	8.2
2001	GLASGOW	M77	SB	85	66	-19	2.2
18	GLASGOW	M8	EB	330	225	-105	6.3
1801	GLASGOW	M8	WB	48	209	161	14.2
21	GLASGOW	M8	EB	132	140	8	0.7
2101	GLASGOW	M8	WB	145	355	210	13.3
23	GLASGOW	M8	EB	48	370	322	22.2
2301	GLASGOW	M8	WB	387	367	-20	1.0
62	GLASGOW	Peat Road	NB	1	27	26	6.9
6202	GLASGOW	Peat Road	SB	2	39	37	8.3
32	HIGHLAND	A9	NB	35	48	13	2.1
3201	HIGHLAND	A9	SB	26	27	1	0.2
35	SOUTH	A702	NB	19	40	21	3.9
3501	SOUTH	A702	SB	8	24	16	4.0
29	SOUTH	A76	NB	22	107	86	10.7
2901	SOUTH	A76	SB	18	96	78	10.3
33	WEST	A83	EB	6	4	-2	0.9
3301	WEST	A83	WB	6	5	-1	0.4
33	WEST	A85	EB	4	4	0	0.1
3301	WEST	A85	WB	1	2	2	1.4

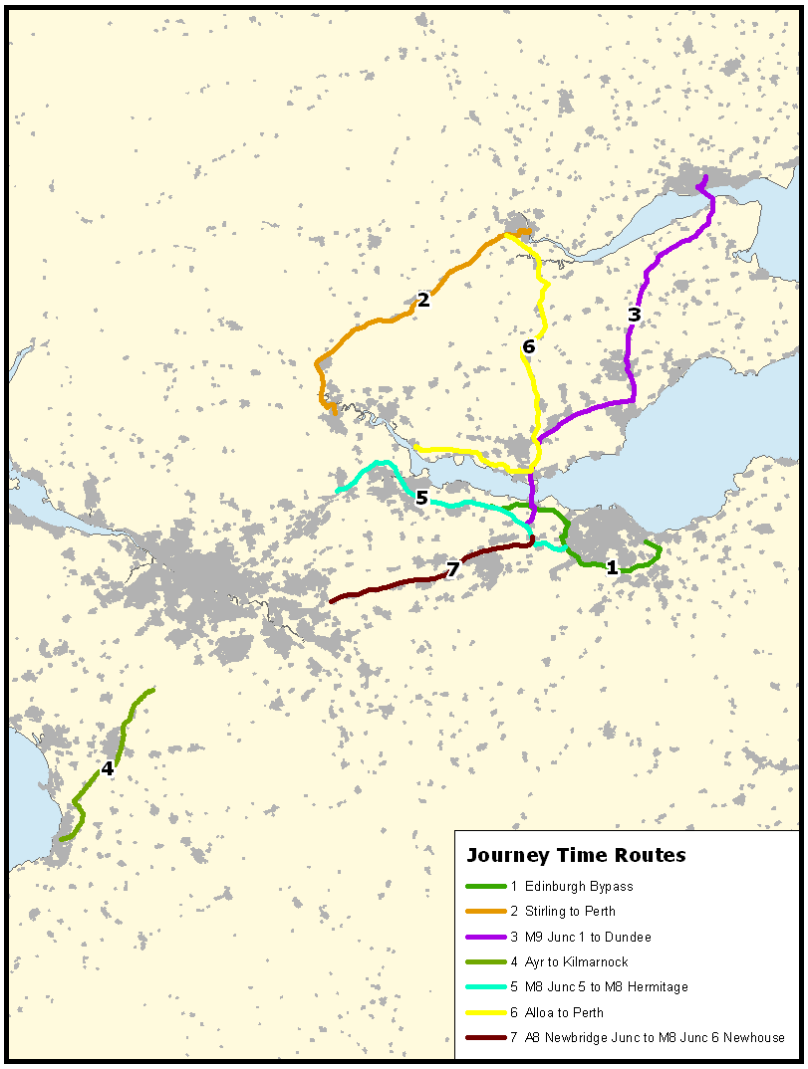
IP Peak Hour HGV Validation – SRTDb Sites on Motorways and A-Roads Only

Screenline Number	Screenline Area	Road	Direction	Observed HGV (Vehicles)	TMfS.07 Road Model HGV Flow (Vehicles)	Difference (vehicles)	GEH
3	ABERDEEN	A90	NB	77	98	21	2.2
301	ABERDEEN	A90	SB	55	101	46	5.2
74	ABERDEEN	A90	NB	21	66	45	6.9
7401	ABERDEEN	A90	SB	21	82	61	8.6
25	CENTRAL & TAYSIDE	A80	NB	182	216	34	2.4
2501	CENTRAL & TAYSIDE	A80	SB	103	262	160	11.8
27	CENTRAL & TAYSIDE	A9 (North of Perth)	SB	25	64	39	5.8
2701	CENTRAL & TAYSIDE	A9 (North of Perth)	NB	35	99	63	7.7
59	CENTRAL & TAYSIDE	A9 (South of Perth)	NB	98	99	1	0.1
5901	CENTRAL & TAYSIDE	A9 (South of Perth)	SB	64	112	48	5.2
41	CENTRAL & TAYSIDE	M8	EB	115	209	94	7.4
4101	CENTRAL & TAYSIDE	M8	WB	108	246	138	10.3
61	CENTRAL & TAYSIDE	M90	NB	109	81	-29	3.0
6101	CENTRAL & TAYSIDE	M90	SB	71	77	6	0.7
10	EDINBURGH	A1	EB	67	108	41	4.4
1001	EDINBURGH	A1	WB	57	125	68	7.1
11	EDINBURGH	A720	EB	103	217	114	9.0
1101	EDINBURGH	A720	WB	114	227	113	8.6
8	EDINBURGH	A8	EB	66	71	5	0.7
801	EDINBURGH	A8	WB	354	249	-106	6.1
12	EDINBURGH	A876 - Kincardine Bridge	NB	60	112	53	5.7
1201	EDINBURGH	A876 - Kincardine Bridge	SB	37	123	85	9.5
67	EDINBURGH	A92	NB	56	156	100	9.7
6701	EDINBURGH	A92	SB	44	142	98	10.2
13	EDINBURGH	A985	EB	6	27	21	5.2
1301	EDINBURGH	A985	WB	23	37	13	2.4
8	EDINBURGH	M8	EB	111	153	43	3.7
801	EDINBURGH	M8	WB	107	97	-10	1.0
14	EDINBURGH	M90	NB	114	91	-23	2.2
1401	EDINBURGH	M90	SB	86	60	-26	3.0
62	GLASGOW	A736	NB	43	91	48	5.8
6202	GLASGOW	A736	SB	71	92	21	2.3
64	GLASGOW	A739	NB	28	190	161	15.4
6401	GLASGOW	A739	SB	17	115	97	12.0
7501	GLASGOW	A749	NB	11	27	16	3.7
21	GLASGOW	A761	EB	4	109	105	13.9
2101	GLASGOW	A761	WB	7	127	120	14.7
63	GLASGOW	A77	NB	2	25	23	6.2
6301	GLASGOW	A77	SB	2	45	43	9.0
16	GLASGOW	A814	EB	67	65	-2	0.2
1601	GLASGOW	A814	WB	53	64	11	1.4
19	GLASGOW	M74	EB	97	234	138	10.7
1901	GLASGOW	M74	WB	97	159	62	5.4
20	GLASGOW	M77	NB	90	55	-35	4.2
2001	GLASGOW	M77	SB	78	62	-16	2.0
18	GLASGOW	M8	EB	305	258	-47	2.8
1801	GLASGOW	M8	WB	89	195	106	8.9
21	GLASGOW	M8	EB	122	288	166	11.6
2101	GLASGOW	M8	WB	134	208	74	5.6
23	GLASGOW	M8	EB	124	283	159	11.2
2301	GLASGOW	M8	WB	704	324	-379	16.7
32	HIGHLAND	A9	NB	33	87	55	7.1
3201	HIGHLAND	A9	SB	24	58	34	5.2
35	SOUTH	A702	NB	17	11	-6	1.6
3501	SOUTH	A702	SB	7	15	8	2.3
29	SOUTH	A76	NB	20	112	92	11.3
2901	SOUTH	A76	SB	16	91	75	10.2
33	WEST	A83	EB	6	0	-6	3.3
3301	WEST	A83	WB	6	0	-6	3.3
33	WEST	A85	EB	3	0	-3	2.5
3301	WEST	A85	WB	1	0	0	0.9

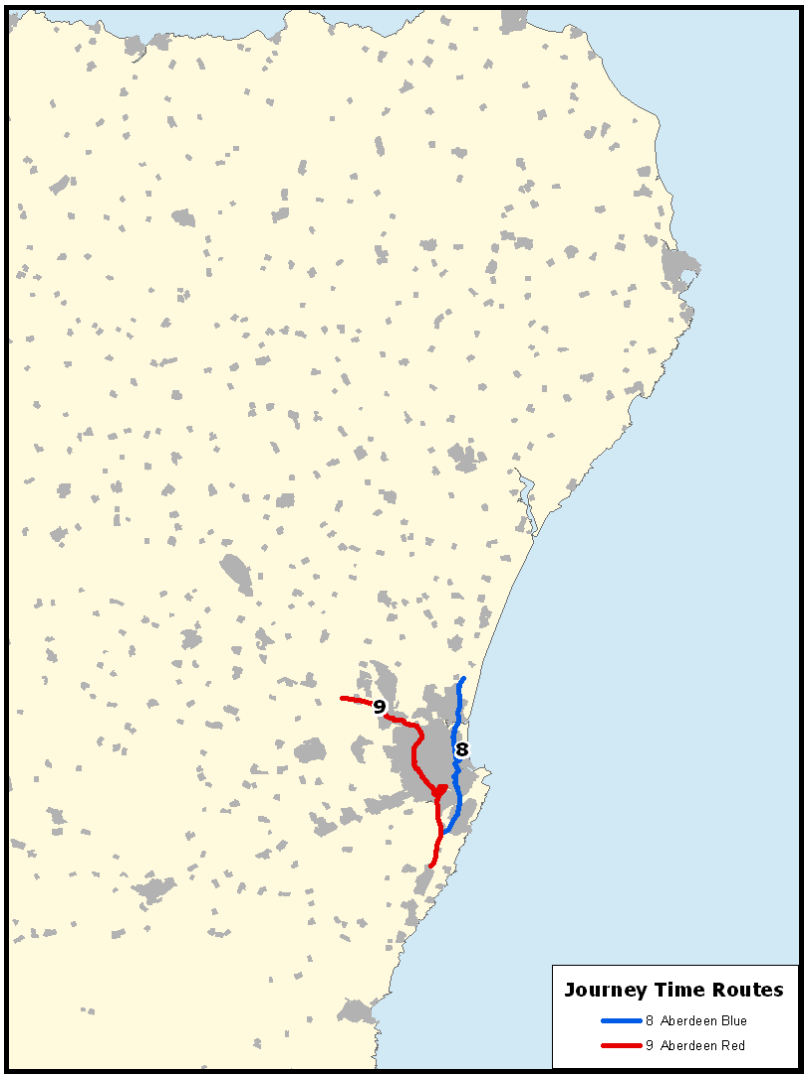
PM Peak Hour HGV Validation – SRTDb Sites on Motorways and A-Roads Only

Screenline Number	Screenline Area	Road	Direction	Observed HGV (Vehicles)	TMfS.07 Road Model HGV Flow (Vehicles)	Difference (vehicles)	GEH
3	ABERDEEN	A90	NB	78	68	-11	1.2
301	ABERDEEN	A90	SB	56	80	24	2.9
74	ABERDEEN	A90	NB	21	84	64	8.8
7401	ABERDEEN	A90	SB	21	41	20	3.6
25	CENTRAL & TAYSIDE	A80	NB	185	113	-72	5.9
2501	CENTRAL & TAYSIDE	A80	SB	104	139	35	3.2
27	CENTRAL & TAYSIDE	A9 (North of Perth)	SB	26	33	8	1.4
2701	CENTRAL & TAYSIDE	A9 (North of Perth)	NB	36	51	15	2.3
59	CENTRAL & TAYSIDE	A9 (South of Perth)	NB	100	32	-67	8.3
5901	CENTRAL & TAYSIDE	A9 (South of Perth)	SB	65	66	1	0.1
41	CENTRAL & TAYSIDE	M8	EB	118	194	77	6.1
4101	CENTRAL & TAYSIDE	M8	WB	111	306	195	13.5
61	CENTRAL & TAYSIDE	M90	NB	112	68	-43	4.6
6101	CENTRAL & TAYSIDE	M90	SB	72	49	-23	3.0
10	EDINBURGH	A1	EB	68	69	0	0.0
1001	EDINBURGH	A1	WB	58	137	78	7.9
11	EDINBURGH	A720	EB	105	205	100	8.0
1101	EDINBURGH	A720	WB	116	251	135	9.9
8	EDINBURGH	A8	EB	67	59	-8	1.0
801	EDINBURGH	A8	WB	361	74	-287	19.4
12	EDINBURGH	A876 - Kincardine Bridge	NB	61	56	-5	0.6
1201	EDINBURGH	A876 - Kincardine Bridge	SB	38	60	22	3.1
67	EDINBURGH	A92	NB	57	120	64	6.8
6701	EDINBURGH	A92	SB	45	122	77	8.4
13	EDINBURGH	A985	EB	6	15	9	2.8
1301	EDINBURGH	A985	WB	24	12	-12	2.7
8	EDINBURGH	M8	EB	113	166	54	4.5
801	EDINBURGH	M8	WB	109	138	29	2.6
14	EDINBURGH	M90	NB	116	124	9	0.8
1401	EDINBURGH	M90	SB	88	148	60	5.5
62	GLASGOW	A736	NB	44	35	-9	1.4
6202	GLASGOW	A736	SB	73	70	-2	0.3
64	GLASGOW	A739	NB	29	186	157	15.2
6401	GLASGOW	A739	SB	18	138	120	13.6
7501	GLASGOW	A749	NB	11	16	5	1.2
21	GLASGOW	A761	EB	4	25	21	5.4
2101	GLASGOW	A761	WB	7	111	104	13.6
63	GLASGOW	A77	NB	2	29	27	6.8
6301	GLASGOW	A77	SB	2	5	3	1.8
16	GLASGOW	A814	EB	68	41	-27	3.7
1601	GLASGOW	A814	WB	54	81	26	3.2
19	GLASGOW	M74	EB	99	186	87	7.3
1901	GLASGOW	M74	WB	99	149	49	4.4
20	GLASGOW	M77	NB	92	24	-68	9.0
2001	GLASGOW	M77	SB	80	40	-40	5.1
18	GLASGOW	M8	EB	311	163	-148	9.6
1801	GLASGOW	M8	WB	23	76	53	7.5
21	GLASGOW	M8	EB	125	133	8	0.7
2101	GLASGOW	M8	WB	137	113	-24	2.1
23	GLASGOW	M8	EB	37	146	109	11.4
2301	GLASGOW	M8	WB	255	207	-47	3.1
32	HIGHLAND	A9	NB	33	50	17	2.6
3201	HIGHLAND	A9	SB	25	26	1	0.2
35	SOUTH	A702	NB	18	1	-17	5.3
3501	SOUTH	A702	SB	7	12	4	1.4
29	SOUTH	A76	NB	21	76	55	8.0
2901	SOUTH	A76	SB	17	59	42	6.8
33	WEST	A83	EB	6	0	-6	3.3
3301	WEST	A83	WB	6	0	-6	3.3
33	WEST	A85	EB	4	5	2	0.8
3301	WEST	A85	WB	1	5	4	2.7

Appendix K – TMfS:05 Re-base Journey Time Routes



TMfS:05 Re-Base Journey Time Routes



TMfS:05 Re-Base Journey Time Routes

AM Peak hour Journey Time Validation – TMfS:05 Re-Base Routes

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)
1	Edinburgh City Bypass	EB	44	59	47	-11.4
		WB	45	57	52	-5.0
2	Perth to Stirling	SB	56	44	43	-0.5
		NB	56	43	43	0.6
3	Edinburgh to Dundee	NB	81	74	74	-0.8
		SB	80	77	78	0.7
4	Ayr to Kilmarnock	SB	33	27	23	-4.1
		NB	33	25	25	0.2
5	M8 Junc 5 to M8 Hermitage	NB	47	29	30	0.2
		SB	47	30	27	-2.7
6	Alloa to Perth	NB	69	48	46	-2.0
		SB	69	49	47	-1.8
7	A8 Newbridge Junc to M8 Junc 6 Newhouse	EB	37	22	23	0.2
		WB	37	25	27	2.4
8	Aberdeen Blue Route	NB	14	36	34	-2.4
		SB	15	37	25	-11.7
9	Aberdeen Red Route	WB	21	23	30	6.1
		EB	21	34	26	-7.2

The Table above demonstrates the models performance in the AM Peak hour. In general the majority of journey time Routes are biased towards being quicker than the observed data, particular offenders are Route 1 and 8.

The largest under-estimation of journey time is for Route 8, Aberdeen "Blue" Route (12 minutes) and the largest over-estimation of journey time is for Route 9, Aberdeen "Red" Route (6 minutes).

Out of the 18 observed journey time Routes, 14 Routes meet DMRB criteria, demonstrating the robust nature of the model.

Average Inter Peak hour Journey Time Validation – TMfS:05 Re-Base Routes

Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)
1	Edinburgh City Bypass	EB	44	45	36	-9.4
		WB	45	41	37	-4.4
2	Perth to Stirling	SB	56	43	43	-0.8
		NB	56	44	42	-1.8
3	Edinburgh to Dundee	NB	81	76	64	-12.3
		SB	80	79	63	-16.7
4	Ayr to Kilmarnock	SB	33	25	22	-3.3
		NB	33	24	24	-0.6
5	M8 Junc 5 to M8 Hermitage	NB	47	29	27	-1.9
		SB	47	30	27	-2.9
6	Alloa to Perth	NB	69	47	45	-2.1
		SB	69	49	45	-3.8
7	A8 Newbridge Junc to M8 Junc 6 Newhouse	EB	37	22	22	-0.7
		WB	37	23	21	-1.2
8	Aberdeen Blue Route	NB	14	29	22	-7.7
		SB	15	28	22	-5.9
9	Aberdeen Red Route	WB	21	24	21	-2.1
		EB	21	23	21	-1.5

It can be seen from the table above all journey time Routes are biased towards being quicker than the observed journey times in the average Inter Peak hour. The largest under-estimation of journey time is Route 3, Edinburgh to Dundee (17 minutes). A total of 13 out of 18 journey time Routes meet DMRB criteria.

PM Peak hour Journey Time Validation – TMfS:05 Re-Base Routes

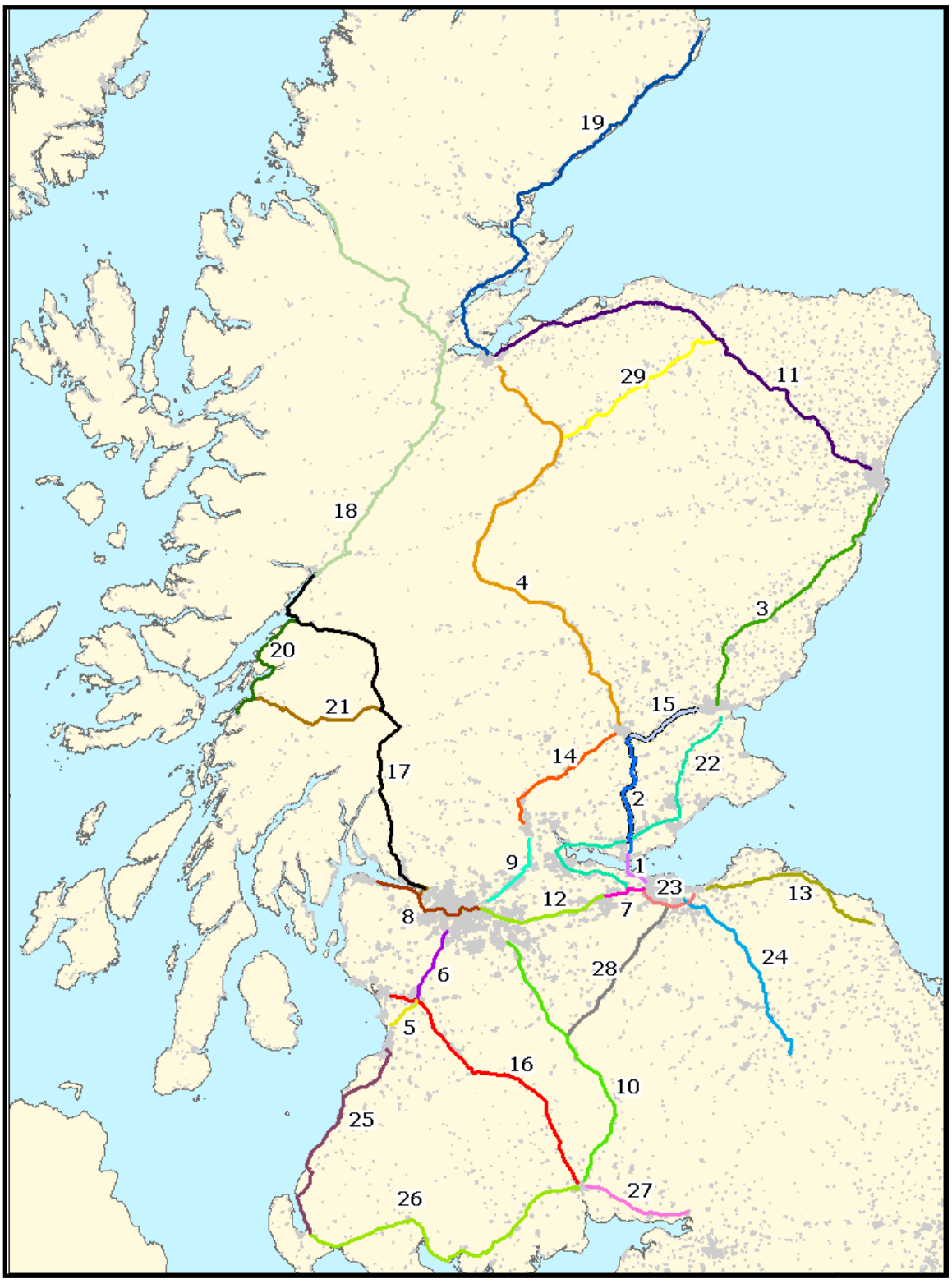
Route Number	Description	Direction	Distance (km)	Observed Journey Time (mins)	TMfS.07 Road Journey Time (mins)	Difference (mins)
1	Edinburgh City Bypass	EB	44	50	58	8.5
		WB	45	79	50	-29.3
2	Perth to Stirling	SB	56	47	44	-3.2
		NB	56	45	44	-0.8
3	Edinburgh to Dundee	NB	81	76	85	9.5
		SB	80	80	69	-10.5
4	Ayr to Kilmarnock	SB	33	28	23	-5.1
		NB	33	25	25	-0.4
5	M8 Junc 5 to M8 Hermitage	NB	47	29	28	-1.5
		SB	47	30	29	-1.5
6	Alloa to Perth	NB	69	49	47	-2.0
		SB	69	56	46	-10.0
7	A8 Newbridge Junc to M8 Junc 6 Newhouse	EB	37	23	26	3.0
		WB	37	25	23	-2.7
8	Aberdeen Blue Route	NB	14	39	25	-14.0
		SB	15	39	35	-3.9
9	Aberdeen Red Route	WB	21	25	28	2.3
		EB	21	23	29	6.1

The table above demonstrates the models performance against the journey time data for the PM Peak hour. In general the vast majority of journey time Routes are biased towards being quicker than the observed data, particular offenders are Route 1 and 8, a pattern previously observed in the AM Peak hour.

The largest under-estimation of journey time is for Route 1, Edinburgh City Bypass (30 minutes) and the largest over-estimation of journey time is for Route 9, Aberdeen "Red" Route (6 minutes).

Out of the 18 observed journey time Routes, 12 Routes meet DMRB criteria, demonstrating the robust nature of the model.

Appendix L – ITIS Journey Time Routes



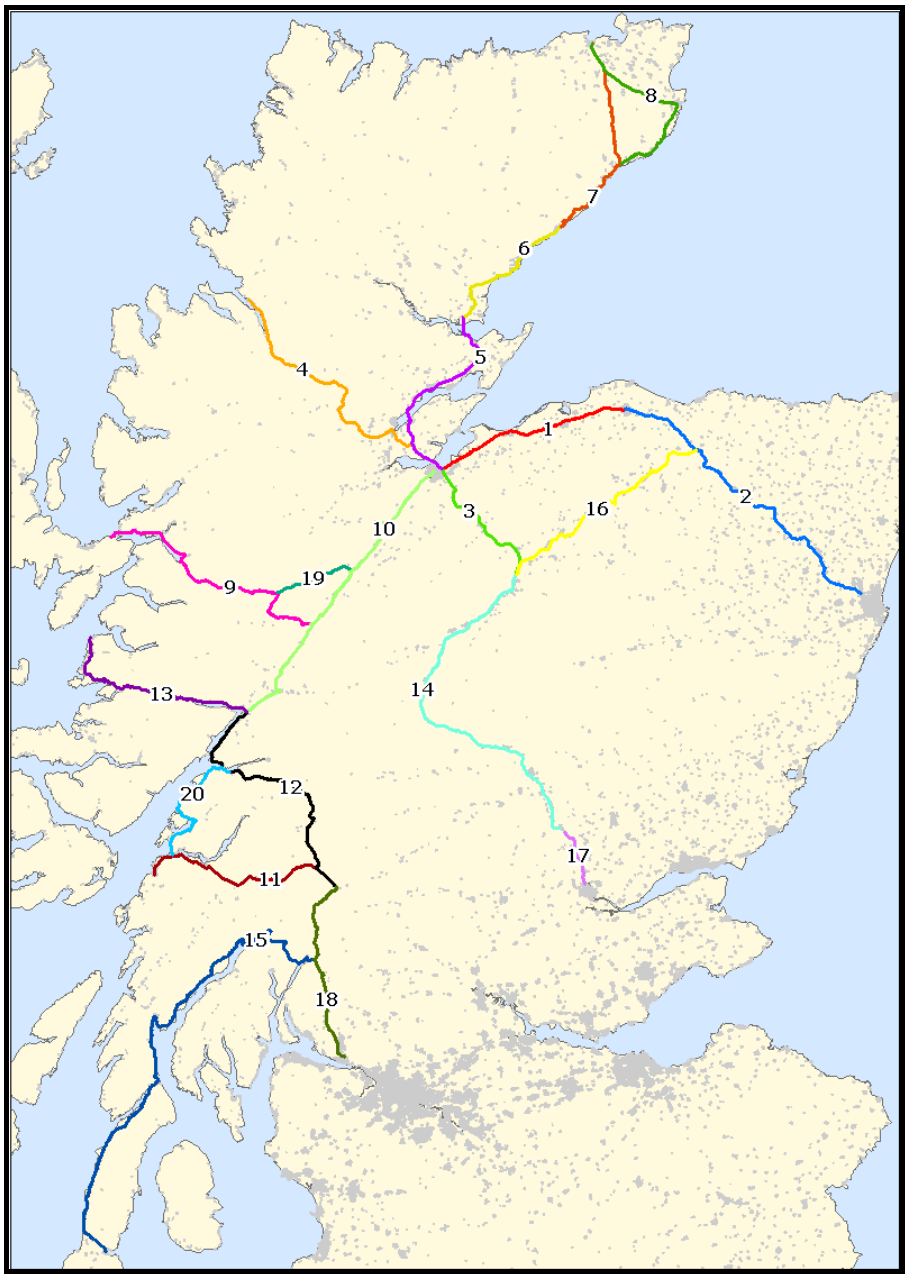
ITIS Journey Time Routes – Key

ITIS Journey Time Routes – Detailed Description

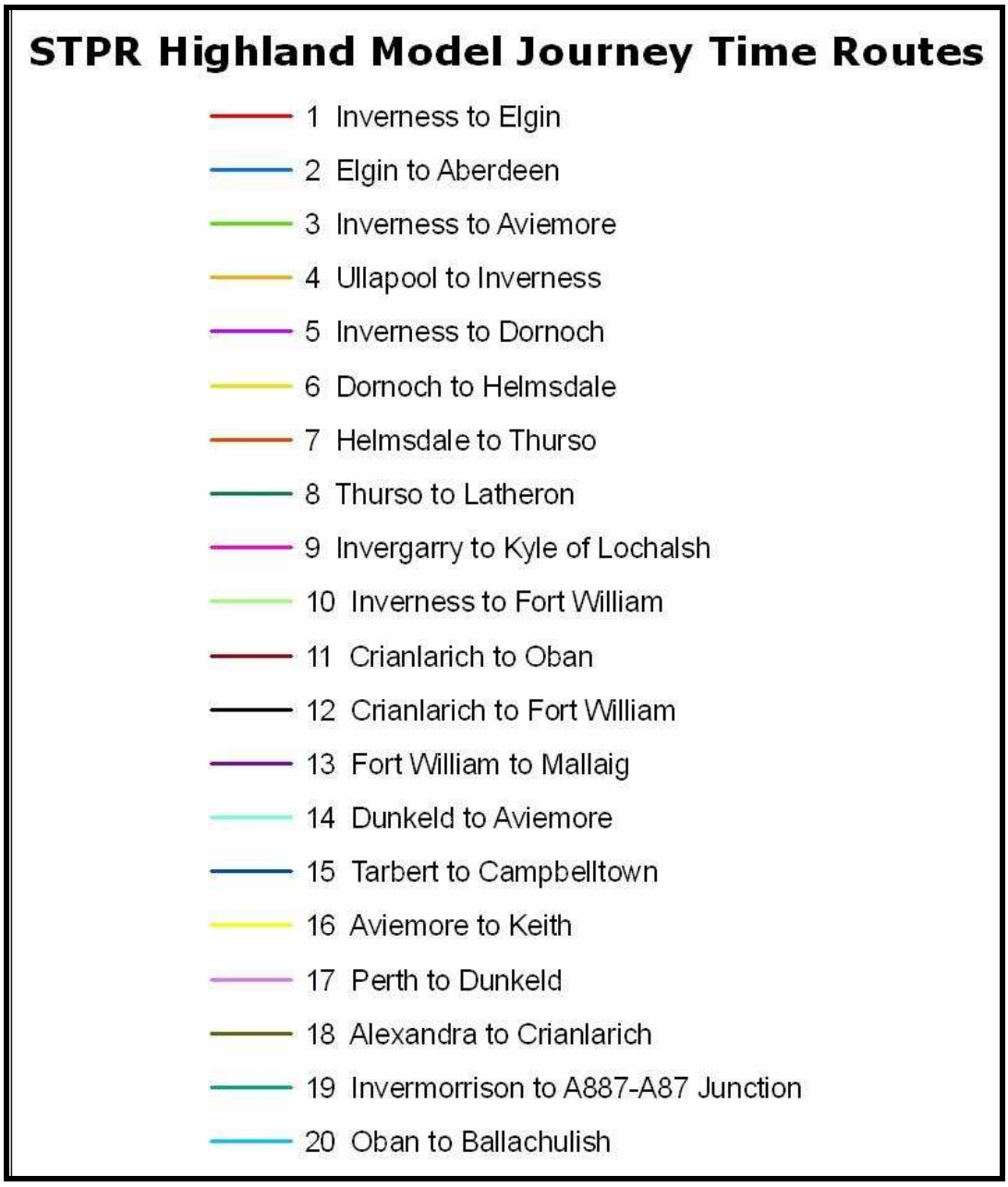
Route	Short Description	Detailed Description
1	Edinburgh to Dunfermline	Start at Queensferry Road Maybury road junction (Edinburgh), take the Forth Bridge and continue along the A90, finish at M90 junction 1, south of Dunfermline.
2	Dunfermline to Perth	Start at M90 junction 2 (Dunfermline), take M90, finish at M90 south of junction 11 (Perth).
3	Dundee to Aberdeen	Start at Forfar road and Kingsway junction (Dundee), take A90, finish at Stonehaven road south of Wellington road junction in Aberdeen.
4	Perth to Inverness	Start Perth, south of Inverlalmond roundabout, take A9, finish where A9 meets B9177 (Inverness).
5	Ayr to Kilmarnock	Start at Kilmarnock road roundabout (Ayr), take A77, finish at Queens Drive west of A77 (Kilmarnock).
6	Kilmarnock to Glasgow	Start at A77 north of Riccarton road (Kilmarnock), take M77, finish at M77 south of Nitshill road (Glasgow).
7	Livingston to Edinburgh	Start at Livingston road crossing M8, take M8 and Glasgow road, finish at Glasgow road at Gyle (Edinburgh).
8	Greenock to Glasgow (Eastend)	Start at Greenock road roundabout north of Ardgowan, take A(M)8, finish at Gartloch Road, Glasgow.
9	Glasgow to Stirling	Start at Cumbernauld roundabout (M80) (NE of Glasgow), take M80, finish at M9 east of M80 intersection (Stirling).
10	Dumfries to Hamilton	Start at A701 Bloomfield, Dumfries, take M74 then A701, finish at M74 junction 6 (south end, Hamilton).
11	Aberdeen to Inverness	Start at Haudagain roundabout, Aberdeen, take A96, finish at A96 north of Eastfield Way in Inverness.
12	Glasgow to Edinburgh	Start at Kingston Bridge, Glasgow, take M9 onto M8, then follow all through to Kingston Bridge, finish at Glasgow road, east of Maybury road (Edinburgh).
13	Ayton to Edinburgh	Start at Old Town, Ayton, take A1, finish at Haddington Road, Edinburgh.
14	Stirling to Perth	Start at Drip road, Stirling, take A9, finish at Broxden Roundabout, Perth.

Route	Short Description	Detailed Description
15	Dunfermline to Dundee	Start at Halbeath rd. and Whitefield rd. junction (Dunfermline), take A92, finish west of Invergowie Main Street, Dundee
16	Dumfries to Irvine	Start at Glasgow road roundabout, Dumfries, take A76 and A71 at Kilmarnock, finish at Dundonald Road, Irvine.
17	Erskine to Fort William	Start at Station road, Erskine, take A82, finish at Ardnevis Road (Fort William).
18	Fort William to Ullapool	Start at Fassifern Road (Fort William), take A82, A833, then A835, finish at Ullapool.
19	Inverness to Wick	Start at Harbour Road, Inverness, take A9, then A99, finish at Wick.
20	Oban to Fort William	Start at Oban, take A82, then A828, finish at Fassifern Road, Fort William.
21	Erskine to Oban	Start at Erskine Hospital, take A85, then A82, finish at Oban.
22	Edinburgh to Dundee	Start at Lochside Avenue, Edinburgh, take A92, A985, A87, M9, M8, finish at Tay Street, Dundee.
23	Edinburgh Bypass	Start at Ferguson Drive (Edinburgh east), take Bypass, finish at Gyle (Edinburgh west).
24	Jedburgh to Edinburgh	Start at Jedburgh, take A68, Lauder rd., Dalkeith, A7, finish at Redcroft street, Edinburgh.
25	Stranraer to Ayr	Start at Stranraer, take A77, finish at St. Andrew St., Ayr.
26	Stranraer to Dumfries	Start at Stranraer, take A75, finish at Cargenbridge, Dumfries.
27	Dumfries to Gretna	Start at Noblehill Avenue (Dumfries), take A75, and finish at Gretna Green Rail.
28	Abington to Edinburgh	Start at Abington, take A702, and finish at Biggar Road (Edinburgh).
29	Kinveachy to Keith	Start at Kinveachy, take A95, finish at Seafield Avenue, Keith.

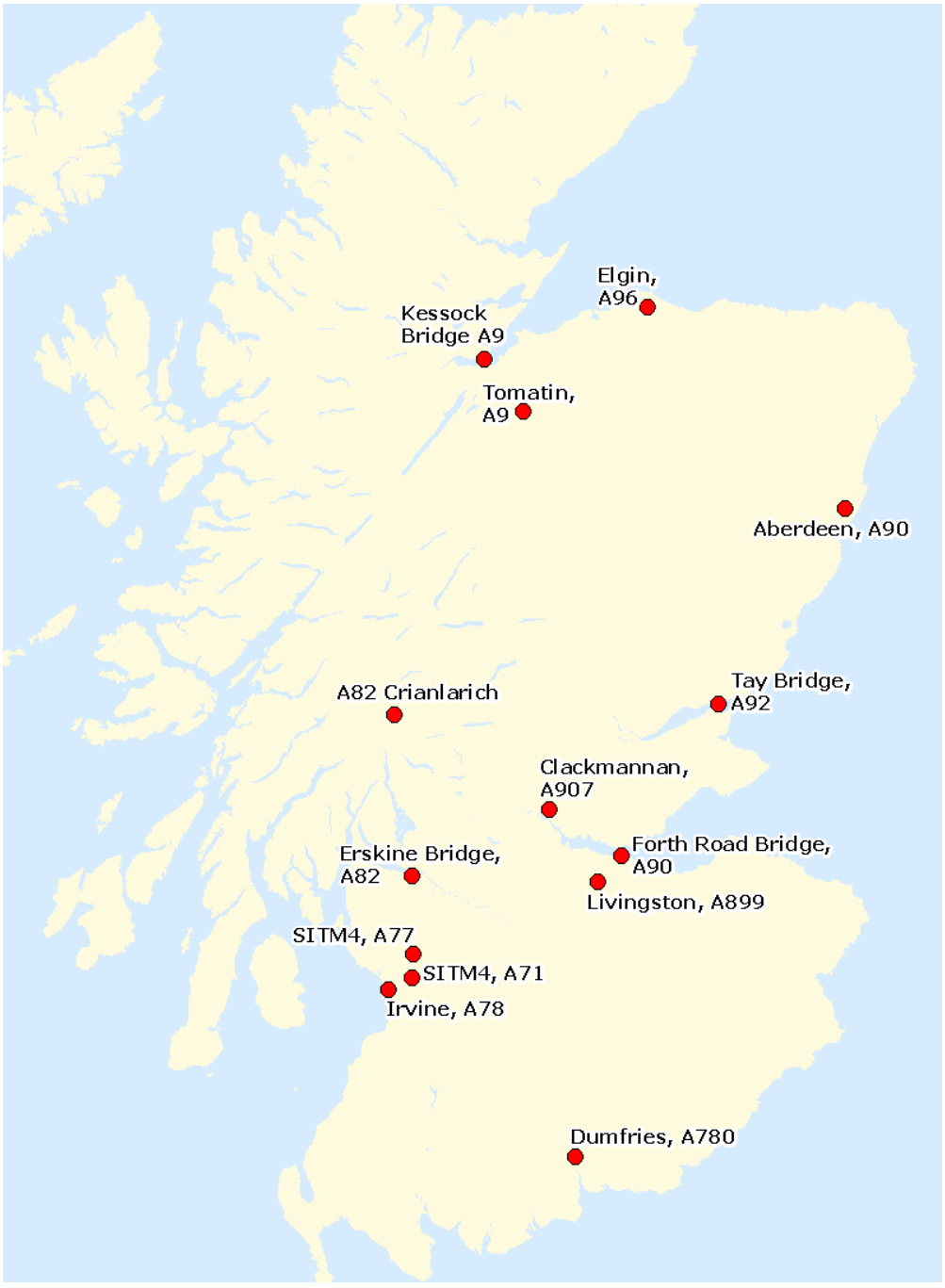
Appendix M – Highland Model Journey Time Routes



STPR Highland Model Journey Time Routes – Key



Appendix N - RSI Journey Length Analysis



AM Peak Hour RSI Journey Length Analysis

Distance (km)	Kessock Bridge		Elgin A96		Tomatin A9		Crianlarich A82		Clackmannan A907		Forth Road Bridge A90		Livingston A899	
	Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters	
	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model
0-50	88%	69%	100%	26%	15%	59%	58%	84%	87%	31%	0%	2%	100%	86%
51-75	8%	7%	0%	5%	45%	19%	15%	14%	10%	22%	0%	2%	0%	13%
76-100	3%	4%	0%	4%	6%	7%	5%	1%	2%	6%	4%	3%	0%	0%
101-150	1%	2%	0%	33%	0%	9%	8%	1%	1%	1%	11%	25%	0%	0%
151-200	0%	3%	0%	9%	8%	3%	1%	0%	0%	5%	30%	21%	0%	0%
201-250	0%	4%	0%	6%	5%	1%	6%	0%	0%	12%	22%	13%	0%	0%
251-300	0%	3%	0%	3%	6%	1%	2%	0%	0%	6%	11%	8%	0%	0%
301-350	0%	2%	0%	1%	5%	0%	1%	0%	0%	2%	0%	7%	0%	0%
351-400	0%	4%	0%	10%	5%	0%	1%	0%	0%	5%	4%	6%	0%	0%
401-500	0%	2%	0%	3%	6%	0%	2%	1%	0%	8%	19%	12%	0%	0%

	SITM4 A77		SITM4 A71		Irvine A78		Erskine Bridge A82		Tay Bridge A92		A90 South of Aberdeen		Dumfries, A780	
Distance (km)	Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Total Vehicles		Total Vehicles		Total Vehicles	
	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model
0-50	57%	48%	86%	77%	96%	81%	60%	69%	89%	94%	85%	89%	-	84%
51-75	32%	41%	4%	12%	4%	12%	6%	12%	2%	1%	13%	7%	-	6%
76-100	6%	3%	2%	2%	0%	2%	6%	5%	3%	2%	0%	2%	-	2%
101-150	4%	5%	0%	5%	0%	3%	11%	4%	2%	3%	1%	2%	-	2%
151-200	0%	1%	0%	3%	0%	0%	5%	2%	0%	0%	0%	0%	-	5%
201-250	0%	0%	0%	0%	0%	1%	7%	4%	0%	0%	0%	0%	-	0%
251-300	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%	-	1%
301-350	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	-	0%
351-400	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	1%
401-500	0%	0%	8%	0%	0%	0%	3%	3%	4%	0%	1%	0%	-	1%

Average Inter Peak Hour RSI Journey Length Analysis

Distance (km)	Kessock Bridge		Elgin A96		Tomatin A9		Crianlarich A82		Clackmannan A907		Forth Road Bridge A90		Livingston A899	
	Car Non-Work Other		Car Non-Work Other		Car Non-Work Other		Car Non-Work Other		Car Non-Work Other		Car Non-Work Other		Car Non-Work Other	
	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model
0-50	58%	45%	79%	91%	7%	65%	67%	93%	92%	47%	2%	34%	-	92%
51-75	10%	14%	7%	4%	35%	15%	14%	6%	8%	16%	3%	1%	-	7%
76-100	10%	2%	3%	1%	5%	9%	10%	1%	1%	7%	3%	1%	-	1%
101-150	6%	1%	6%	2%	6%	5%	2%	0%	0%	1%	17%	38%	-	0%
151-200	4%	1%	3%	0%	5%	1%	1%	0%	0%	1%	30%	11%	-	0%
201-250	2%	1%	0%	0%	10%	2%	1%	0%	0%	4%	11%	2%	-	0%
251-300	2%	23%	0%	1%	13%	1%	1%	0%	0%	4%	9%	1%	-	0%
301-350	2%	1%	0%	0%	3%	0%	1%	0%	0%	2%	6%	3%	-	0%
351-400	1%	1%	0%	0%	3%	0%	0%	0%	0%	2%	3%	1%	-	0%
401-500	5%	10%	1%	0%	13%	2%	4%	0%	0%	15%	15%	7%	-	0%

	SITM4 A77		SITM4 A71		Irvine A78		Erskine Bridge A82		Tay Bridge A92		A90 South of Aberdeen		Dumfries, A780	
Distance (km)	Car Non-Work Other		Car Non-Work Other		Car Non-Work Other		Car Non-Work Other		Total Vehicles		Total Vehicles		Total Vehicles	
	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model
0-50	34%	49%	58%	88%	95%	91%	57%	62%	84%	93%	82%	92%	85%	80%
51-75	39%	39%	10%	10%	5%	7%	7%	11%	4%	2%	10%	7%	9%	9%
76-100	11%	8%	5%	1%	0%	1%	4%	4%	2%	2%	3%	1%	1%	1%
101-150	8%	2%	2%	0%	0%	0%	8%	5%	2%	2%	2%	0%	2%	7%
151-200	4%	1%	1%	0%	0%	1%	5%	3%	0%	1%	1%	0%	2%	2%
201-250	1%	0%	0%	0%	0%	0%	12%	6%	0%	0%	1%	0%	0%	0%
251-300	0%	0%	1%	0%	0%	0%	5%	2%	0%	0%	0%	0%	1%	0%
301-350	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%	1%	0%
351-400	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%
401-500	1%	0%	23%	0%	0%	0%	2%	6%	7%	0%	1%	0%	1%	0%

PM Peak Hour RSI Journey Length Analysis

Distance (km)	Kessock Bridge		Elgin A96		Tomatin A9		Crianlarich A82		Clackmannan A907		Forth Road Bridge A90		Livingston A899	
	Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters	
	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model
0-50	78%	50%	59%	73%	12%	62%	66%	89%	90%	12%	0%	5%	86%	88%
51-75	12%	14%	15%	5%	29%	23%	17%	9%	8%	13%	7%	4%	13%	10%
76-100	3%	5%	3%	3%	9%	8%	7%	1%	1%	4%	7%	5%	0%	1%
101-150	1%	2%	15%	15%	8%	4%	4%	0%	0%	4%	13%	25%	0%	1%
151-200	2%	6%	9%	2%	6%	1%	1%	0%	0%	7%	13%	23%	0%	0%
201-250	2%	6%	0%	0%	12%	1%	2%	0%	1%	21%	27%	8%	0%	0%
251-300	0%	4%	0%	0%	18%	0%	1%	0%	0%	13%	7%	9%	1%	0%
301-350	0%	2%	0%	0%	2%	0%	0%	0%	0%	5%	13%	7%	0%	0%
351-400	1%	4%	0%	0%	0%	0%	0%	0%	0%	9%	0%	5%	0%	0%
401-500	1%	7%	0%	1%	3%	1%	1%	0%	0%	12%	13%	9%	0%	0%

	SITM4 A77		SITM4 A71		Irvine A78		Erskine Bridge A82		Tay Bridge A92		A90 South of Aberdeen		Dumfries, A780	
Distance (km)	Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Car Non-Work Commuters		Total Vehicles		Total Vehicles		Total Vehicles	
	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model	Observed	Model
0-50	34%	36%	57%	83%	95%	85%	62%	64%	85%	92%	87%	85%	76%	73%
51-75	52%	51%	15%	10%	5%	7%	15%	10%	3%	2%	9%	11%	14%	13%
76-100	7%	5%	4%	2%	0%	1%	7%	3%	2%	2%	2%	1%	1%	3%
101-150	6%	3%	2%	3%	0%	3%	7%	4%	3%	2%	1%	1%	1%	5%
151-200	1%	2%	0%	2%	0%	3%	2%	3%	0%	1%	0%	1%	3%	4%
201-250	0%	0%	0%	0%	0%	1%	8%	7%	0%	0%	0%	0%	0%	1%
251-300	0%	1%	0%	0%	0%	0%	1%	3%	0%	0%	1%	0%	2%	1%
301-350	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	2%	0%
351-400	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
401-500	0%	0%	21%	0%	0%	0%	0%	5%	6%	0%	0%	0%	1%	0%

Appendix O - RSI and Modelled LA to LA Movements

1 Note that all comparisons are based on the Car Non Work Commuters user class in the AM and PM time period and Car Non Work Other in the Inter Peak.

2 However, for three of the sites, namely Tay Bridge, Aberdeen, and Dumfries all three time periods are based on total user classes.

Kessock Bridge SB - AM Modelled

AM Kessock Bridge, A9 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland				1%	6%	2%	1%	1%		1%		84%		3%	1%		100%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	1%	6%	2%	1%	1%	0%	1%	0%	84%	0%	3%	1%	0%	0%	100%

Kessock Bridge SB – AM Observed

AM Kessock Bridge, A9 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland											99%		1%				100%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%	1%	0%	0%	0%	100%

Kessock Bridge SB – IP Modelled

IP Kessock Bridge, A9 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland						1%				9%		64%		23%	1%		100%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	1%	0%	0%	9%	0%	64%	0%	23%	1%	0%	0%	100%

Kessock Bridge SB – IP Observed

IP Kessock Bridge, A9 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	1%
Fife																	0%
Highland				1%	1%		1%			2%	1%	85%		6%	1%		98%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	1%	1%	0%	1%	0%	0%	2%	1%	86%	0%	6%	1%	0%	0%	100%

Kessock Bridge – PM Modelled

PM Kessock Bridge, A9 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland				1%	2%	2%	1%	1%		4%	1%	76%		7%	3%	1%	100%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	1%	2%	2%	1%	1%	0%	4%	1%	76%	0%	7%	3%	1%	0%	100%

Kessock Bridge – PM Observed

PM Kessock Bridge, A9 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland											97%		2%	1%			100%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	97%	0%	2%	1%	0%	0%	100%

Elgin, A96 WB – AM Modelled

AM Elgin, A96 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland				30%							2%		16%				48%
Lothians																	0%
North East				6%									47%				52%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	35%	0%	0%	0%	0%	0%	0%	2%	0%	63%	0%	0%	0%	100%

Elgin, A96 WB – AM Observed

AM Elgin, A96 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East													100%				100%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%

Elgin, A96 WB – IP Modelled

IP Elgin, A96 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland													10%				11%
Lothians																	0%
North East													89%				89%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%	0%	0%	100%

Elgin, A96 WB – IP Observed

IP Elgin, A96 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland					9%								24%				32%
Lothians																	0%
North East					1%								65%				66%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	90%	0%	0%	0%	100%

Elgin, A96 WB – PM Modelled

PM Elgin, A96 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland				4%							2%		17%				24%
Lothians																	0%
North East				5%									71%				76%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	2%	0%	89%	0%	0%	0%	100%

Elgin, A96 WB –PM Observed

PM Elgin, A96 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland													27%				27%
Lothians																	0%
North East												1%	72%				73%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	99%	0%	0%	0%	100%

Tomatin, A9 NB – AM Modelled

AM Tomatin, A9 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire											1%						1%
Central											2%						2%
Aberdeen (City)											1%						1%
Dundee											5%						5%
Edinburgh											3%						3%
Glasgow											1%						1%
Dumfires & Galloway																	0%
England & Wales											4%						4%
Fife											1%						1%
Highland											62%						62%
Lothians											1%						1%
North East											9%						9%
Perthshire & Kinross											7%						7%
Strathclyde											2%						2%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%

Tomatin, A9 NB – AM Observed

AM Tomatin, A9 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire											2%						2%
Central																	0%
Aberdeen (City)																	0%
Dundee											2%		2%				3%
Edinburgh											3%						3%
Glasgow											5%						5%
Dumfires & Galloway																	0%
England & Wales											5%						5%
Fife											2%						2%
Highland											71%						71%
Lothians																	0%
North East											5%						5%
Perthshire & Kinross											5%						5%
Strathclyde											2%						2%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	0%	2%	0%	0%	0%	100%

Tomatin, A9 NB – IP Modelled

IP Tomatin, A9 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central											1%						1%
Aberdeen (City)																	0%
Dundee											2%						2%
Edinburgh											5%						5%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales											13%						13%
Fife																	0%
Highland											71%						71%
Lothians																	0%
North East											2%						2%
Perthshire & Kinross											4%						4%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%

Tomatin, A9 NB – IP Observed

IP Tomatin, A9 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire											1%						1%
Central											5%						5%
Aberdeen (City)																	0%
Dundee											1%						1%
Edinburgh											7%						7%
Glasgow											3%						3%
Dumfires & Galloway																	0%
England & Wales											7%						7%
Fife											5%						5%
Highland											49%						50%
Lothians											1%						1%
North East											4%						4%
Perthshire & Kinross											12%						12%
Strathclyde											3%						3%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%

Tomatin, A9 NB – PM Modelled

PM Tomatin, A9 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire											1%						1%
Central											4%						4%
Aberdeen (City)											5%						5%
Dundee											13%						13%
Edinburgh											7%						7%
Glasgow											2%						2%
Dumfires & Galloway																	0%
England & Wales											6%						6%
Fife											3%						3%
Highland											35%						35%
Lothians											1%						1%
North East											10%						10%
Perthshire & Kinross											11%						11%
Strathclyde											2%						2%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%

Tomatin, A9 NB – PM Observed

PM Tomatin, A9 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central											2%						2%
Aberdeen (City)											2%						2%
Dundee											3%						3%
Edinburgh											8%						8%
Glasgow											2%						2%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife											5%						5%
Highland											46%		2%				48%
Lothians											3%						3%
North East											9%						9%
Perthshire & Kinross											17%						17%
Strathclyde											3%						3%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	0%	2%	0%	0%	0%	100%

Crianlarich, A82 NB – AM Modelled

AM Crianlarich, A82 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute	12%										2%						15%
Ayrshire	1%										7%						8%
Central	4%										5%						9%
Aberdeen (City)	2%																2%
Dundee											1%						1%
Edinburgh	3%										4%						6%
Glasgow	1%										11%						12%
Dumfires & Galloway	1%										2%						2%
England & Wales	2%										3%						5%
Fife	3%																3%
Highland																	0%
Lothians	1%										2%						3%
North East	2%																2%
Perthshire & Kinross	5%										1%						6%
Strathclyde	22%										5%						26%
Borders																	0%
Total	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%	0%	0%	0%	0%	100%

Crianlarich, A82 NB – AM Observed

AM Crianlarich, A82 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire											4%						4%
Central	7%		19%								15%						41%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh											11%						11%
Glasgow											4%						4%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians											4%						4%
North East	7%		4%														11%
Perthshire & Kinross											4%				4%		7%
Strathclyde	4%										15%						19%
Borders																	0%
Total	19%	0%	22%	0%	0%	0%	0%	0%	0%	0%	56%	0%	0%	0%	4%	0%	100%

Crianlarich, A82 NB – IP Modelled

IP Crianlarich, A82 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute	44%																44%
Ayrshire	2%																3%
Central	8%																9%
Aberdeen (City)	2%																2%
Dundee																	0%
Edinburgh	1%										1%						2%
Glasgow	8%										1%						9%
Dumfires & Galloway																	0%
England & Wales	3%										4%						7%
Fife																	0%
Highland																	0%
Lothians																	0%
North East	1%																1%
Perthshire & Kinross	1%										1%						1%
Strathclyde	22%										1%						23%
Borders																	0%
Total	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	100%

Crianlarich, A82 NB – IP Observed

IP Crianlarich, A82 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute	1%										2%						3%
Ayrshire	1%										2%						3%
Central	12%			8%							16%						36%
Aberdeen (City)																	0%
Dundee											1%						1%
Edinburgh	3%										6%						8%
Glasgow	4%										9%						14%
Dumfires & Galloway	1%										2%						4%
England & Wales	2%			1%							6%						10%
Fife	1%										3%						3%
Highland																	0%
Lothians	1%										1%						2%
North East																	0%
Perthshire & Kinross	1%										1%						2%
Strathclyde	6%			1%							6%						13%
Borders																	0%
Total	35%	0%	11%	0%	0%	0%	0%	0%	0%	0%	54%	0%	0%	0%	0%	0%	100%

Crianlarich, A82 NB - PM Modelled

PM Crianlarich, A82 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute	11%										5%						16%
Ayrshire	1%										1%						1%
Central	14%										5%						19%
Aberdeen (City)	5%																5%
Dundee																	0%
Edinburgh	3%										3%						6%
Glasgow	13%										7%						20%
Dumfires & Galloway	1%										1%						2%
England & Wales	1%										2%						3%
Fife	1%																1%
Highland																	0%
Lothians	1%										1%						1%
North East	1%																1%
Perthshire & Kinross	1%										1%						2%
Strathclyde	15%										7%						22%
Borders	1%																1%
Total	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	100%

Crianlarich, A82 NB - PM Observed

PM Crianlarich, A82 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute											13%						13%
Ayrshire	7%										7%						13%
Central	7%		7%								7%				7%		27%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh			7%								13%						20%
Glasgow	13%																13%
Dumfires & Galloway																	0%
England & Wales											7%						7%
Fife																	0%
Highland																	0%
Lothians																	0%
North East	7%																7%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	33%	0%	13%	0%	0%	0%	0%	0%	0%	0%	47%	0%	0%	0%	7%	0%	100%

Clackmannan, A907 EB – AM Modelled

AM Clackmannan, A907 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central			53%			9%	1%			28%		7%			1%		100%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	53%	0%	0%	9%	1%	0%	0%	28%	0%	7%	0%	0%	1%	0%	100%

Clackmannan, A907 EB – AM Observed

AM Clackmannan, A907 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central			100%														100%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Clackmannan, A907 EB – IP Modelled

IP Clackmannan, A907 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central			50%			4%					36%		7%		1%		100%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	50%	0%	0%	4%	0%	0%	0%	36%	0%	7%	0%	1%	0%	0%	100%

Clackmannan, A907 EB – IP Observed

IP Clackmannan, A907 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Clackmannan, A907 EB – PM Modelled

PM Clackmannan, A907 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute											1%						1%
Ayrshire																	0%
Central			60%			8%					23%		4%	1%	3%		99%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	60%	0%	0%	8%	0%	0%	0%	24%	0%	4%	1%	3%	0%	0%	100%

Clackmannan, A907 EB – PM Observed

PM Clackmannan, A907 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central			50%			3%			1%	28%		2%		6%	10%		100%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	50%	0%	0%	3%	0%	0%	1%	28%	0%	2%	0%	6%	10%	0%	100%

Forth Road Bridge, A90 NB – AM Modelled

AM FRB, A90 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central											3%						3%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh				4%		3%					49%	1%		4%	8%		69%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales				2%							1%						3%
Fife																	0%
Highland																	0%
Lothians				1%		1%					17%			1%	1%		22%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde											1%						1%
Borders											1%						2%
Total	0%	0%	0%	8%	4%	0%	0%	0%	0%	72%	1%	0%	6%	9%	0%	0%	100%

Forth Road Bridge, A90 NB – AM Observed

AM FRB, A90 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central											1%			1%			3%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh						1%					46%		4%	8%			59%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife											3%			1%			4%
Highland																	0%
Lothians				1%		3%					16%	1%		9%			31%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde											1%			1%			3%
Borders																	0%
Total	0%	0%	0%	1%	4%	0%	0%	0%	0%	68%	1%	0%	4%	22%	0%	0%	100%

Forth Road Bridge, A90 NB – IP Modelled

IP FRB, A90 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central											2%						2%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh					1%	5%					56%	1%		2%	9%		72%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales					2%						1%			1%			5%
Fife																	0%
Highland																	0%
Lothians											18%				1%		20%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde											1%						1%
Borders																	0%
Total	0%	0%	0%	0%	2%	5%	0%	0%	0%	0%	78%	1%	0%	3%	11%	0%	0%	100%

Forth Road Bridge, A90 NB – IP Observed

IP FRB, A90 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central											3%				1%		4%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh						2%	1%			1%	50%			1%	9%		64%
Glasgow											1%						1%
Dumfires & Galloway																	0%
England & Wales											1%						2%
Fife											5%						6%
Highland																	0%
Lothians						1%					13%			1%	2%		16%
North East																	1%
Perthshire & Kinross											1%						1%
Strathclyde											2%				1%		2%
Borders											2%						3%
Total	0%	0%	0%	0%	1%	3%	1%	0%	0%	1%	79%	0%	0%	2%	14%	0%	0%	100%

Forth Road Bridge, A90 NB – PM Modelled

PM FRB, A90 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh					1%	2%					63%	1%		2%	10%		79%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	1%
Fife																	0%
Highland																	0%
Lothians						1%					15%			1%	2%		19%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	1%
Total	0%	0%	0%	0%	2%	3%	0%	0%	0%	0%	79%	1%	0%	3%	12%	0%	0%	100%

Forth Road Bridge, A90 NB – PM Observed

PM FRB, A90 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central						1%					4%						6%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh				1%		2%	5%			1%	44%		1%		6%		62%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife											1%				2%		4%
Highland																	0%
Lothians					1%	1%	1%				15%			1%	1%		21%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde							1%				4%						6%
Borders											1%						1%
Total	0%	0%	2%	1%	3%	8%	0%	0%	1%	71%	0%	1%	2%	10%	0%	0%	100%

Livingston, A899 NB – AM Modelled

AM Livingston, A899 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh							1%					1%			1%		3%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians				6%	1%	1%	36%	2%			6%	42%			2%		97%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	6%	1%	1%	36%	3%	0%	0%	6%	0%	44%	0%	0%	3%	0%	100%

Livingston, A899 NB – AM Observed

AM Livingston, A899 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire												1%					1%
Central												7%					7%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh															1%		1%
Glasgow												3%					3%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians				3%		1%	29%	1%			5%	34%			3%		77%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde												11%					12%
Borders																	0%
Total	0%	0%	3%	0%	1%	29%	2%	0%	0%	5%	0%	56%	0%	0%	4%	0%	100%

Livingston, A899 NB – IP Modelled

IP Livingston, A899 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	1%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians			11%			22%	2%				6%	50%			6%		98%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde												1%					1%
Borders																	0%
Total	0%	0%	11%	0%	0%	22%	2%	0%	0%	6%	0%	52%	0%	0%	6%	0%	100%

Livingston, A899 NB – IP Observed

IP Livingston, A899 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central												3%					3%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh												1%					1%
Glasgow												1%					1%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians			3%			13%	1%				4%	69%		1%	1%		91%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde						1%						4%					4%
Borders																	0%
Total	0%	0%	3%	0%	0%	14%	1%	0%	0%	4%	0%	77%	0%	1%	1%	0%	100%

Livingston, A899 NB – PM Modelled

PM Livingston, A899 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh												1%					1%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians				9%			23%				8%		56%			1%	1%	99%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	9%	0%	0%	23%	0%	0%	0%	8%	0%	57%	0%	1%	1%	0%	100%

Livingston, A899 NB – PM Observed

PM Livingston, A899 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh												2%					2%
Glasgow												2%					2%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians				7%			22%				8%		50%			2%		90%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde												6%					6%
Borders																	0%
Total	0%	0%	0%	7%	0%	0%	22%	0%	0%	0%	8%	0%	60%	0%	0%	2%	0%	100%

Irvine, A78 NB – AM Modelled

AM Irvine, A78 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute		1%															1%
Ayrshire		90%							2%								92%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		7%															7%
Borders																	0%
Total	0%	98%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Irvine, A78 NB – AM Observed

AM Irvine, A78 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		89%													11%		100%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	100%

Irvine, A78 NB – IP Modelled

IP Irvine, A78 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	1%
Ayrshire		94%															94%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		5%															5%
Borders																	0%
Total	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Irvine, A78 NB – IP Observed

IP Irvine, A78 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire	2%	84%	1%				1%								10%		98%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	1%
England & Wales																	1%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	2%	85%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	10%	0%	100%

Irvine, A78 NB – PM Modelled

PM Irvine, A78 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		87%							2%								89%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		10%															10%
Borders																	0%
Total	0%	98%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Irvine, A78 NB – PM Observed

PM Irvine, A78 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		91%		1%											6%		98%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway		1%															1%
England & Wales		1%															1%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	93%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	100%

Erskine, A82 EB – AM Modelled

AM Erskine Bridge, A82 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute		1%					9%								21%		33%
Ayrshire																	0%
Central		3%					23%								39%		65%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland															1%		2%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	1%	4%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	62%	0%	100%

Erskine, A82 EB – AM Observed

AM Erskine Bridge, A82 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Erskine, A82 EB – IP Modelled

IP Erskine Bridge, A82 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute		2%					9%								17%		28%
Ayrshire																	0%
Central		3%					27%								42%		72%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	5%	0%	0%	0%	0%	36%	0%	0%	0%	0%	0%	0%	0%	59%	0%	100%

Erskine, A82 EB – IP Observed

IP Erskine Bridge, A82 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute			15%				14%		1%	1%			1%		1%		31%
Ayrshire			1%														1%
Central			37%			1%	27%		1%	1%		1%			1%		67%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland			1%												1%		1%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde							1%										1%
Borders																	0%
Total	0%	0%	53%	0%	0%	1%	41%	0%	1%	1%	0%	1%	1%	0%	2%	0%	100%

Erskine, A82 EB – PM Modelled

PM Erskine Bridge, A82 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute			4%				6%								31%		42%
Ayrshire																	0%
Central	1%		5%				16%								34%		56%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland			1%				1%								1%		3%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	1%	9%	0%	0%	0%	0%	23%	1%	0%	0%	0%	0%	0%	0%	66%	0%	100%

Erskine, A82 EB – PM Observed

PM Erskine Bridge, A82 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute			13%				13%	1%	1%						3%	1%	32%
Ayrshire																	0%
Central			38%				22%		1%						5%		67%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland							1%										1%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	51%	0%	0%	0%	36%	1%	2%	0%	0%	0%	0%	0%	9%	1%	100%

SITM4, A71 SB – AM Modelled

AM SITM4, A77 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		9%							1%								9%
Central		6%															6%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh		1%															1%
Glasgow		36%															36%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland		1%															1%
Lothians		1%															1%
North East		1%															1%
Perthshire & Kinross																	0%
Strathclyde		43%							1%								44%
Borders																	0%
Total	0%	98%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	100%

SITM4, A71 SB – AM Observed

AM SITM4, A77 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		49%															50%
Central		5%															5%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow		18%							1%								19%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians		2%															2%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		25%															25%
Borders																	0%
Total	0%	98%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	100%

SITM4, A71 SB – IP Modelled

IP SITM4, A77 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute		1%															1%
Ayrshire		5%															5%
Central		3%															3%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow		41%															41%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		47%							1%								48%
Borders																	0%
Total	0%	99%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	100%

SITM4, A71 SB – IP Observed

IP SITM4, A77 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute		1%															1%
Ayrshire		28%															28%
Central		5%															5%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh		3%						1%									3%
Glasgow		24%						2%									26%
Dumfires & Galloway																	0%
England & Wales		1%															1%
Fife																	1%
Highland								1%									1%
Lothians		1%															1%
North East		1%															1%
Perthshire & Kinross																	1%
Strathclyde		29%						1%									29%
Borders																	0%
Total	0%	95%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	100%

SITM4, A71 SB – PM Modelled

PM SITM4, A77 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	1%
Ayrshire		5%															5%
Central		3%															3%
Aberdeen (City)		2%															2%
Dundee																	0%
Edinburgh		1%															1%
Glasgow		44%															44%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland		1%															1%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		41%							1%								42%
Borders																	0%
Total	0%	97%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	100%

SITM4, A71 SB – PM Observed

PM SITM4, A77 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		30%															30%
Central		8%															8%
Aberdeen (City)																	0%
Dundee		1%															1%
Edinburgh		1%															1%
Glasgow		33%							1%								34%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians		2%															2%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		24%															25%
Borders																	0%
Total	0%	98%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	100%

SITM4, A77 WB – AM Modelled

AM SITM4, A71 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		67%	1%				8%	1%							5%		82%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		16%															16%
Borders		2%															2%
Total	0%	86%	1%	0%	0%	0%	8%	1%	0%	0%	0%	0%	0%	0%	5%	0%	100%

SITM4, A77 WB - AM Observed

AM SITM4, A71 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		73%	1%				12%								6%		91%
Central		1%															1%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		8%															8%
Borders																	0%
Total	0%	82%	1%	0%	0%	0%	12%	0%	0%	0%	0%	0%	0%	0%	6%	0%	100%

SITM4, A77 WB – IP Modelled

IP SITM4, A71 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		60%	1%				16%								13%		89%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		10%															10%
Borders		1%															1%
Total	0%	70%	1%	0%	0%	0%	16%	0%	0%	0%	0%	0%	0%	0%	13%	0%	100%

SITM4, A77 WB – IP Observed

IP SITM4, A71 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		71%					4%								2%		77%
Central		1%															1%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh		1%															1%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales		4%															4%
Fife																	0%
Highland																	0%
Lothians		1%															1%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		16%															17%
Borders																	0%
Total	0%	94%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	2%	0%	100%

SITM4, A77 WB – PM Modelled

PM SITM4, A71 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		70%	1%				4%	1%							4%		79%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians		2%															2%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		14%															14%
Borders		5%															5%
Total	0%	91%	1%	0%	0%	0%	4%	1%	0%	0%	0%	0%	0%	0%	4%	0%	100%

SITM4, A77 WB – PM Observed

PM SITM4, A71 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire		62%													4%		66%
Central		2%															2%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow		2%															2%
Dumfires & Galloway																	0%
England & Wales		4%															4%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde		26%															26%
Borders																	0%
Total	0%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	100%

Tay Bridge SB– AM Modelled

AM Tay Bridge, A92 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)										2%							2%
Dundee										70%							70%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East										23%							23%
Perthshire & Kinross										5%							5%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%	0%	0%	0%	0%	0%	100%

Tay Bridge SB– AM Observed

AM Tay Bridge, A92 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)										1%							1%
Dundee										67%							67%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East										24%							24%
Perthshire & Kinross										8%							8%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%

Tay Bridge SB– IP Modelled

IP Tay Bridge, A92 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)										1%							1%
Dundee										86%							87%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East										10%							10%
Perthshire & Kinross										3%							3%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%

Tay Bridge SB– IP Observed

IP Tay Bridge, A92 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)										1%							1%
Dundee										83%							83%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East										11%							11%
Perthshire & Kinross										4%							4%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%

Tay Bridge SB– PM Modelled

PM Tay Bridge, A92 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)										5%							5%
Dundee										83%							84%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East										8%							8%
Perthshire & Kinross										2%							2%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%	0%	0%	0%	0%	0%	100%

Tay Bridge SB– PM Observed

PM Tay Bridge, A92 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)										1%							1%
Dundee										84%				1%			85%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East										10%							10%
Perthshire & Kinross										4%							4%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%	0%	0%	1%	0%	0%	100%

Aberdeen, A90 SB – AM Modelled

AM Aberdeen, A90 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)				1%		1%	1%			2%	2%		72%		2%		83%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	1%
Lothians																	0%
North East													14%				16%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	1%	0%	2%	2%	1%	0%	2%	2%	0%	0%	87%	1%	2%	0%	100%

Aberdeen, A90 SB – AM Observed

AM Aberdeen, A90 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)				1%	2%	3%	1%	1%			4%	1%	61%	2%	2%		78%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East						3%					1%		16%				22%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	1%	2%	5%	2%	2%	0%	0%	5%	0%	1%	76%	3%	3%	0%	100%

Aberdeen, A90 SB – IP Modelled

IP Aberdeen, A90 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)			1%	2%		3%	2%	1%		5%	2%		1%	70%	1%	3%		89%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	1%
Lothians																	0%
North East										1%				8%			10%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%		1%	2%	0%	3%	2%	1%	0%	6%	2%	0%	1%	78%	1%	3%	0%	100%

Aberdeen, A90 SB – IP Observed

IP Aberdeen, A90 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)			1%	2%		3%	3%	2%			3%		1%	61%	2%	4%		83%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East				1%		1%	2%				1%		1%	8%	1%	1%		17%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%		1%	3%	1%	4%	4%	2%	0%	0%	4%	0%	2%	70%	3%	5%	1%	100%

Aberdeen, A90 SB - PM Modelled

PM Aberdeen, A90 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)			1%	2%		2%	2%	2%		5%	2%		1%	73%	1%	3%	95%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	1%
Lothians																	0%
North East													4%				5%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	1%	2%	0%	2%	2%	2%	0%	5%	3%	0%	1%	77%	1%	3%	0%	100%

Aberdeen, A90 SB – PM Observed

PM Aberdeen, A90 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	0%
Central																	0%
Aberdeen (City)				2%		2%	2%				1%		1%	81%	1%	3%	93%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway																	0%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East							1%						5%	1%			7%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	2%	0%	3%	3%	0%	0%	0%	1%	0%	1%	85%	2%	3%	0%	100%

Dumfries, A780 EB – AM Modelled

AM Dumfries, A780 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire								2%									2%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway						1%		97%									98%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	1%	0%	99%	0%	0%	0%	0%	0%	0%	0%	0%	100%

Dumfries, A780 EB – AM Observed

AM Dumfries, A780 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire								1%									1%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway								97%	1%								99%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	99%	1%	0%	0%	0%	0%	0%	0%	0%	100%

Dumfries, A780 EB – IP Modelled

IP Dumfries, A780 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire									1%								1%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway						1%			95%	1%							99%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	1%	0%	96%	1%	0%	0%	0%	0%	0%	0%	0%	100%

Dumfries, A780 EB – IP Observed

IP Dumfries, A780 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire																	1%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway									97%	1%							98%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde									1%								1%
Borders																	0%
Total	0%	0%	0%	0%	0%	0%	0%	99%	1%	0%	0%	0%	0%	0%	0%	0%	100%

Dumfries, A780 EB – PM Modelled

PM Dumfries, A780 Modelled PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire									2%								2%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway						1%			95%	1%							97%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	0%	0%	0%	1%	0%	97%	1%	0%	0%	0%	0%	0%	0%	0%	100%

Dumfries, A780 EB – PM Observed

PM Dumfries, A780 Observed PCU's	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfires & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	Borders	Total
Argyll & Bute																	0%
Ayrshire									1%								1%
Central																	0%
Aberdeen (City)																	0%
Dundee																	0%
Edinburgh																	0%
Glasgow																	0%
Dumfires & Galloway				1%					98%	1%							99%
England & Wales																	0%
Fife																	0%
Highland																	0%
Lothians																	0%
North East																	0%
Perthshire & Kinross																	0%
Strathclyde																	0%
Borders																	0%
Total	0%	0%	1%	0%	0%	0%	0%	99%	1%	0%	0%	0%	0%	0%	0%	0%	100%

Appendix P – Car In-Work & Car Non-Work RSI Analysis

AM RSI Site	Location	Car In-Work		Car Non-Work	
		Observed	Modelled	Observed	Modelled
A9 Tomatin	A9, Tomatin	4%	5%	96%	95%
Aviemore Site 1	A9, Aviemore	0%	5%	100%	95%
Aviemore Site 2	A9, Aviemore	2%	6%	98%	94%
Clackmannan Site 1	A907, Clackmannan Rd	11%	10%	89%	90%
Clackmannan Site 2	A908, Alloa Rd	4%	8%	96%	92%
Clackmannan Site 3	B908, Fairfield	5%	7%	95%	93%
Clackmannan Site 4	A907, Stirling Rd	3%	5%	97%	95%
Clackmannan Site 5	B9140, Glenochil/Muirside R/B	6%	10%	94%	90%
Clackmannan Site 6	A91, West Stirling Rd	4%	8%	96%	92%
Elgin Site 1	A96, B9103/ road to Elginhill	0%	10%	100%	90%
Elgin Site 2	A941, Thornhill Rd/Speed s	0%	3%	100%	97%
Elgin Site 3	A941, Spynie Place/Myreside	0%	5%	100%	95%
Elgin Site 4	A916, Elgin Limits/Derelict B	0%	9%	100%	91%
Forth Rd Bridge	Forth Rd Bridge	1%	10%	99%	90%
Highland Site 1	A9, Pitlochry	4%	2%	96%	98%
Highland Site 2	A82, Crianlarich	5%	5%	95%	95%
Highland Site 3	A96, Outside Inverness	5%	9%	95%	91%
Highland Site 4	A862, Beauly	2%	15%	98%	85%
Highland Site 5	A95, Granton on Spey	13%	6%	87%	94%
Highland Site 6	A9, North of Inverness	12%	3%	88%	97%
Irvine Site 1	A737, S of Dalry	8%	8%	92%	92%
Irvine Site 2	B780, N of Ardrossan Bypass	1%	7%	99%	93%
Irvine Site 3	B778, N orth of Redstone Avenue	1%	6%	99%	94%
Irvine Site 4	A736, Cairnmount Road	4%	7%	96%	93%
Irvine Site 5	B769, Middlepart Road	3%	7%	97%	93%
Irvine Site 6	Old Stewart Rd	8%	10%	92%	90%
Irvine Site 7	B7081, Main Road, Near Springside	7%	4%	93%	96%
Irvine Site 8	A78, S of Meadowhead Av	3%	8%	97%	92%
Irvine Site 9	A78, S of Keir Hardie Rd	0%	7%	100%	93%
Irvine Site 10	B780, Darly Road North of Chapelhill	7%	6%	93%	94%
Irvine Site 11	Dalry Rd	12%	6%	88%	94%
Irvine Site 12	A78, Hawkhill Dr	8%	7%	92%	93%
Irvine Site 13	A737	4%	6%	96%	94%
Irvine Site 14	A736, Bank Street, N of Woodlands Av	2%	7%	98%	93%
Irvine Site 15	B7081, Annick Rd	8%	9%	92%	91%
Irvine Site 16	A71	2%	11%	98%	89%
Irvine Site 17	A737, S of Shewalton Rd	5%	10%	95%	90%
Irvine Site 18	Marine Dr	8%	7%	92%	93%
Kilmarnock Site 1	A735, Queen St	0%	2%	100%	98%
Kilmarnock Site 2	A759, Dundonald Rd	2%	5%	98%	95%
Kilmarnock Site 3	B7081, Irvine Road	0%	10%	100%	90%
Kilmarnock Site 4	A735, Kilmaurs Rd	0%	6%	100%	94%
Livingston Site 1	Livingston, A71	3%	5%	97%	95%
Livingston Site 2	Livingston, A71	3%	12%	97%	88%
Livingston Site 3	Livingston, A705	3%	10%	97%	90%
Livingston Site 4	Livingston, A779	4%	3%	96%	97%
Livingston Site 5	Livingston, A899	12%	6%	88%	94%
Oban Site 1	A85, South of Camus Rd,	2%	10%	98%	90%
Oban Site 2	A85, Corran Esplanade	13%	7%	87%	93%
Oban Site 3	A816, Soroba Rd	6%	17%	94%	83%
SITM4 Site 1	A70, Lugar	12%	6%	88%	94%
SITM4 Site 2	A71, E of Galston	6%	9%	94%	91%
SITM4 Site 3	A79 S of Seamil	3%	8%	97%	92%
SITM4 Site 4	A77, N of Girvan	6%	6%	94%	94%
SITM4 Site 5	A76, N of New Cumnock	3%	7%	97%	93%
SITM4 Site 6	A737, Beith Bypass	12%	10%	88%	90%
SITM4 Site 7	A736, Burnhouse	7%	13%	93%	87%
SITM4 Site 8	A71, West of Kilmarnock	4%	9%	96%	91%
SITM4 Site 9	A70, E of Ayr	2%	11%	98%	89%
SITM4 Site 10	A78, S of Pennyburn	8%	7%	92%	93%
SITM4 Site 11	A77, N of B7038 Kilmarnock	4%	6%	96%	94%
SITM4 Site 12	A713, Polnessan	4%	8%	96%	92%
SITM4 Site 17	A737, Kilwinning Rd	8%	6%	92%	94%
SITM4 Site 14	A77, Slip from B7038 Kilmar	10%	6%	90%	94%
A82 Erskine Bridge	A82 Erskine Bridge	-	9%	-	91%
Brora	Brora	13%	5%	87%	95%

IP RSI Site	Location	Car In-Work		Car Non-Work	
		Observed	Modelled	Observed	Modelled
A9 Tomatin	A9, Tomatin	6%	6%	94%	94%
Aviemore Site 1	A9, Aviemore	3%	5%	97%	95%
Aviemore Site 2	A9, Aviemore	4%	5%	96%	95%
Clackmannan Site 1	A907, Clackmannan Rd	-	8%	-	92%
Clackmannan Site 2	A908, Alloa Rd	-	5%	-	95%
Clackmannan Site 3	B908, Fairfield	-	6%	-	94%
Clackmannan Site 4	A907, Stirling Rd	-	6%	-	94%
Clackmannan Site 5	B9140, Glenochil/Muirside R/B	-	6%	-	94%
Clackmannan Site 6	A91, West Stirling Rd	-	6%	-	94%
Elgin Site 1	A96, B9103/ road to Elginhill	0%	6%	100%	94%
Elgin Site 2	A941, Thornhill Rd/Speed s	0%	8%	100%	92%
Elgin Site 3	A941, Spynie Place/Myreside	0%	6%	100%	94%
Elgin Site 4	A916, Elgin Limits/Derelict B	0%	8%	100%	92%
Forth Rd Bridge	Forth Rd Bridge	2%	16%	98%	84%
Highland Site 1	A9, Pitlochry	9%	6%	91%	94%
Highland Site 2	A82, Crianlarich	7%	28%	93%	72%
Highland Site 3	A96, Outside Inverness	11%	10%	89%	90%
Highland Site 4	A862, Beauly	9%	8%	91%	92%
Highland Site 5	A95, Granton on Spey	11%	7%	89%	93%
Highland Site 6	A9, North of Inverness	10%	8%	90%	92%
Irvine Site 1	A737, S of Dalry	20%	7%	80%	93%
Irvine Site 2	B780, N of Ardrossan Bypass	17%	6%	83%	94%
Irvine Site 3	B778, N orth of Redstone Avenue	13%	6%	87%	94%
Irvine Site 4	A736, Cairnmount Road	19%	9%	81%	91%
Irvine Site 5	B769, Middlepart Road	13%	7%	87%	93%
Irvine Site 6	Old Stewart Rd	17%	12%	83%	88%
Irvine Site 7	B7081, Main Road, Near Springside	11%	5%	89%	95%
Irvine Site 8	A78, S of Meadowhead Av	14%	8%	86%	92%
Irvine Site 9	A78, S of Keir Hardie Rd	8%	7%	92%	93%
Irvine Site 10	B780, Darly Road North of Chapelhill	16%	6%	84%	94%
Irvine Site 11	Dalry Rd	11%	6%	89%	94%
Irvine Site 12	A78, Hawkhill Dr	14%	7%	86%	93%
Irvine Site 13	A737	1%	6%	99%	94%
Irvine Site 14	A736, Bank Street, N of Woodlands Av	10%	7%	90%	93%
Irvine Site 15	B7081, Annick Rd	7%	7%	93%	93%
Irvine Site 16	A71	9%	11%	91%	89%
Irvine Site 17	A737, S of Shewalton Rd	10%	7%	90%	93%
Irvine Site 18	Marine Dr	9%	6%	91%	94%
Kilmarnock Site 1	A735, Queen St	-	3%	-	97%
Kilmarnock Site 2	A759, Dundonald Rd	-	7%	-	93%
Kilmarnock Site 3	B7081, Irvine Road	-	11%	-	89%
Kilmarnock Site 4	A735, Kilmaurs Rd	-	5%	-	95%
Livingston Site 1	Livingston, A71	11%	8%	89%	92%
Livingston Site 2	Livingston, A71	11%	8%	89%	92%
Livingston Site 3	Livingston, A705	12%	7%	88%	93%
Livingston Site 4	Livingston, A779	14%	4%	86%	96%
Livingston Site 5	Livingston, A899	19%	9%	81%	91%
Oban Site 1	A85, South of Camus Rd,	10%	7%	90%	93%
Oban Site 2	A85, Corran Esplanade	10%	7%	90%	93%
Oban Site 3	A816, Soroba Rd	9%	7%	91%	93%
SITM4 Site 1	A70, Lugar	14%	9%	86%	91%
SITM4 Site 2	A71, E of Galston	12%	7%	88%	93%
SITM4 Site 3	A79 S of Seamil	12%	7%	88%	93%
SITM4 Site 4	A77, N of Girvan	14%	6%	86%	94%
SITM4 Site 5	A76, N of New Cumnock	15%	5%	85%	95%
SITM4 Site 6	A737, Beith Bypass	16%	4%	84%	96%
SITM4 Site 7	A736, Burnhouse	14%	8%	86%	92%
SITM4 Site 8	A71, West of Kilmarnock	16%	10%	84%	90%
SITM4 Site 9	A70, E of Ayr	12%	6%	88%	94%
SITM4 Site 10	A78, S of Pennyburn	19%	9%	81%	91%
SITM4 Site 11	A77, N of B7038 Kilmarnock	15%	12%	85%	88%
SITM4 Site 12	A713, Polnessan	21%	15%	79%	85%
SITM4 Site 17	A737, Kilwinning Rd	11%	6%	89%	94%
SITM4 Site 14	A77, Slip from B7038 Kilmar	17%	12%	83%	88%
A82 Erskine Bridge	A82 Erskine Bridge	14%	9%	86%	91%
Brora	Brora	10%	13%	90%	87%

PM RSI Site	Location	Car In-Work		Car Non-Work	
		Observed	Modelled	Observed	Modelled
A9 Tomatin	A9, Tomatin	8%	6%	92%	94%
Aviemore Site 1	A9, Aviemore	8%	4%	92%	96%
Aviemore Site 2	A9, Aviemore	0%	4%	100%	96%
Clackmannan Site 1	A907, Clackmannan Rd	1%	6%	99%	94%
Clackmannan Site 2	A908, Alloa Rd	0%	5%	100%	95%
Clackmannan Site 3	B908, Fairfield	0%	5%	100%	95%
Clackmannan Site 4	A907, Stirling Rd	2%	5%	98%	95%
Clackmannan Site 5	B9140, Glenochil/Muirside R/B	5%	6%	95%	94%
Clackmannan Site 6	A91, West Stirling Rd	4%	5%	96%	95%
Elgin Site 1	A96, B9103/ road to Elginhill	1%	6%	99%	94%
Elgin Site 2	A941, Thornhill Rd/Speed s	2%	4%	98%	96%
Elgin Site 3	A941, Spynie Place/Myreside	2%	8%	98%	92%
Elgin Site 4	A916, Elgin Limits/Derelict B	0%	6%	100%	94%
Forth Rd Bridge	Forth Rd Bridge	5%	7%	95%	93%
Highland Site 1	A9, Pitlochry	8%	6%	92%	94%
Highland Site 2	A82, Crianlarich	0%	6%	100%	94%
Highland Site 3	A96, Outside Inverness	9%	7%	91%	93%
Highland Site 4	A862, Beauly	2%	9%	98%	91%
Highland Site 5	A95, Granton on Spey	4%	11%	96%	89%
Highland Site 6	A9, North of Inverness	3%	5%	97%	95%
Irvine Site 1	A737, S of Dalry	0%	7%	100%	93%
Irvine Site 2	B780, N of Ardrossan Bypass	3%	6%	97%	94%
Irvine Site 3	B778, N orth of Redstone Avenue	3%	6%	97%	94%
Irvine Site 4	A736, Cairnmount Road	3%	7%	97%	93%
Irvine Site 5	B769, Middlepart Road	1%	5%	99%	95%
Irvine Site 6	Old Stewart Rd	3%	8%	97%	92%
Irvine Site 7	B7081, Main Road, Near Springside	4%	4%	96%	96%
Irvine Site 8	A78, S of Meadowhead Av	3%	6%	97%	94%
Irvine Site 9	A78, S of Keir Hardie Rd	1%	5%	99%	95%
Irvine Site 10	B780, Darly Road North of Chapelhill	0%	5%	100%	95%
Irvine Site 11	Dalry Rd	1%	5%	99%	95%
Irvine Site 12	A78, Hawkhill Dr	2%	5%	99%	95%
Irvine Site 13	A737	2%	4%	98%	96%
Irvine Site 14	A736, Bank Street, N of Woodlands Av	4%	5%	96%	95%
Irvine Site 15	B7081, Annick Rd	1%	6%	99%	94%
Irvine Site 16	A71	1%	5%	99%	95%
Irvine Site 17	A737, S of Shewalton Rd	1%	4%	99%	96%
Irvine Site 18	Marine Dr	2%	5%	98%	95%
Kilmarnock Site 1	A735, Queen St	14%	2%	86%	98%
Kilmarnock Site 2	A759, Dundonald Rd	3%	2%	97%	98%
Kilmarnock Site 3	B7081, Irvine Road	3%	6%	97%	94%
Kilmarnock Site 4	A735, Kilmaurs Rd	1%	5%	99%	95%
Livingston Site 1	Livingston, A71	0%	6%	100%	94%
Livingston Site 2	Livingston, A71	5%	5%	95%	95%
Livingston Site 3	Livingston, A705	3%	1%	97%	99%
Livingston Site 4	Livingston, A779	2%	7%	98%	93%
Livingston Site 5	Livingston, A899	7%	7%	93%	93%
Oban Site 1	A85, South of Camus Rd,	7%	6%	93%	94%
Oban Site 2	A85, Corran Esplanade	3%	6%	97%	94%
Oban Site 3	A816, Soroba Rd	1%	9%	99%	91%
SITM4 Site 1	A70, Lugar	8%	7%	92%	93%
SITM4 Site 2	A71, E of Galston	4%	6%	96%	94%
SITM4 Site 3	A79 S of Seamil	3%	5%	97%	95%
SITM4 Site 4	A77, N of Girvan	6%	8%	94%	92%
SITM4 Site 5	A76, N of New Cumnock	5%	5%	95%	95%
SITM4 Site 6	A737, Beith Bypass	4%	4%	96%	96%
SITM4 Site 7	A736, Burnhouse	4%	8%	96%	92%
SITM4 Site 8	A71, West of Kilmarnock	2%	6%	98%	94%
SITM4 Site 9	A70, E of Ayr	4%	5%	96%	95%
SITM4 Site 10	A78, S of Pennyburn	-	6%	-	94%
SITM4 Site 11	A77, N of B7038 Kilmarnock	2%	8%	98%	92%
SITM4 Site 12	A713, Polnessan	4%	5%	96%	95%
SITM4 Site 17	A737, Kilwinning Rd	6%	4%	94%	96%
SITM4 Site 14	A77, Slip from B7038 Kilmar	2%	8%	98%	92%
A82 Erskine Bridge	A82 Erskine Bridge	2%	5%	98%	95%
Brora	Brora	2%	5%	98%	95%

Appendix Q - Trip Ends versus Planning Data

	TMfS: 07 Base Year Planning Data				AM Peak Hour Final Matrix					
Local Authority	**Population**	**Employment**	**Population Ranking**	**Employment Ranking**	**Productions**	**Attractions**	**Productions Ranking**	**Attractions Rankings**	**Ranking Difference**	**Ranking Difference**
Aberdeenshire	229679	75725	7	9	19059	14513	8	11	-1	-2
Angus	107444	35137	19	22	7354	6296	22	23	-3	-1
Argyll & Bute	88438	41707	23	19	7102	6770	24	21	-1	-2
City of Aberdeen	213675	144460	8	3	20793	26244	7	4	1	-1
City of Dundee	144036	64194	13	12	10156	12332	16	14	-3	-2
City of Edinburgh	458355	273513	2	2	49731	56297	2	2	0	0
City of Glasgow	585134	344560	1	1	50720	60139	1	1	0	0
Clackmannan	48099	15722	29	29	4587	3828	29	29	0	0
Dumfries & Galloway	145800	64696	11	11	13050	12821	12	12	-1	-1
East Ayrshire	116334	40740	16	20	10236	9668	15	18	1	2
East Dunbartonshire	100124	26146	20	27	9340	6310	19	22	1	5
East Lothian	90218	28577	21	24	7156	5858	23	25	-2	-1
East Renfrewshire	84248	20646	25	28	8427	5753	20	27	5	1

	TMfS: 07 Base Year Planning Data				AM Peak Hour Final Matrix					
Local Authority	Population	Employment	Population Ranking	Employment Ranking	Productions	Attractions	Productions Ranking	Attractions Rankings	Ranking Difference	Ranking Difference
England & Wales	-	-	-	-	1634	1499	30	30	-	-
Falkirk	144391	60897	12	13	15015	14629	11	10	1	3
Fife	341884	142829	3	4	31168	29040	3	3	0	1
Highland	277265	127088	6	5	24334	24294	6	6	0	-1
Inverclyde	79069	36198	27	21	5967	5398	28	28	-1	-7
Midlothian	76568	27817	28	26	6730	5899	26	24	2	2
Moray	86683	32122	24	23	6940	6820	25	20	-1	3
North Ayrshire	132817	47293	15	16	11905	11827	14	15	1	1
North Lanarkshire	316770	119483	4	7	28015	26025	4	5	0	2
Perthshire & Kinross	136043	53720	14	14	12781	12510	13	13	1	1
Renfrewshire	167415	71223	9	10	16960	17821	9	8	0	2
South Ayrshire	110070	47219	17	17	9425	9804	18	17	-1	0
South Lanarkshire	296100	121417	5	6	25275	22656	5	7	0	-1
Stirling	82998	48821	26	15	9928	9897	17	16	9	-1
The Borders	107851	43922	18	18	7904	7086	21	19	-3	-1

TMfS: 07 Base Year Planning Data					AM Peak Hour Final Matrix					
Local Authority	Population	Employment	Population Ranking	Employment Ranking	Productions	Attractions	Productions Ranking	Attractions Rankings	Ranking Difference	Ranking Difference
West Dunbartonshire	89282	28566	22	25	6061	5835	27	26	-5	-1
West Lothian	158984	76672	10	8	16774	16661	10	9	0	-1

TMfS: 07 Base Year Planning Data					Inter-Peak Hour Final Matrix					
Local Authority	**Population**	**Employment**	**Population Ranking**	**Employment Ranking**	**Productions**	**Attractions**	**Productions Ranking**	**Attractions Rankings**	**Ranking Difference**	**Ranking Difference**
Aberdeenshire	229679	75725	7	9	12530	12440	8	9	-1	0
Angus	107444	35137	19	22	5673	5734	21	21	-2	1
Argyll & Bute	88438	41707	23	19	5451	5436	22	22	1	-3
City of Aberdeen	213675	144460	8	3	16843	16788	7	7	1	-4
City of Dundee	144036	64194	13	12	9999	9794	13	14	0	-2
City of Edinburgh	458355	273513	2	2	42274	41613	2	2	0	0
City of Glasgow	585134	344560	1	1	47530	47490	1	1	0	0
Clackmannan	48099	15722	29	29	3275	3222	29	29	0	0
Dumfries & Galloway	145800	64696	11	11	10730	10533	12	12	-1	-1
East Ayrshire	116334	40740	16	20	6737	6842	18	18	-2	2
East Dunbartonshire	100124	26146	20	27	5960	5883	20	20	0	7
East Lothian	90218	28577	21	24	5240	5283	25	25	-4	-1
East Renfrewshire	84248	20646	25	28	5354	5323	23	24	2	4
England & Wales	-	-	-	-	1798	2001	30	30	-	-

TMfS: 07 Base Year Planning Data					Inter-Peak Hour Final Matrix					
Local Authority	**Population**	**Employment**	**Population Ranking**	**Employment Ranking**	**Productions**	**Attractions**	**Productions Ranking**	**Attractions Rankings**	**Ranking Difference**	**Ranking Difference**
Falkirk	144391	60897	12	13	11451	11442	11	11	1	2
Fife	341884	142829	3	4	23255	23383	3	3	0	1
Highland	277265	127088	6	5	18460	18483	5	5	1	0
Inverclyde	79069	36198	27	21	4803	4621	26	26	1	-5
Midlothian	76568	27817	28	26	4371	4388	28	28	0	-2
Moray	86683	32122	24	23	5300	5422	24	23	0	0
North Ayrshire	132817	47293	15	16	9085	9979	15	13	0	3
North Lanarkshire	316770	119483	4	7	21495	21777	4	4	0	3
Perthshire & Kinross	136043	53720	14	14	9476	9562	14	15	0	-1
Renfrewshire	167415	71223	9	10	12250	12094	10	10	-1	0
South Ayrshire	110070	47219	17	17	7569	7474	17	17	0	0
South Lanarkshire	296100	121417	5	6	18201	17744	6	6	-1	0
Stirling	82998	48821	26	15	7958	7722	16	16	10	-1
The Borders	107851	43922	18	18	6292	6342	19	19	-1	-1
West Dunbartonshire	89282	28566	22	25	4555	4467	27	27	-5	-2

TMfS: 07 Base Year Planning Data					Inter-Peak Hour Final Matrix					
Local Authority	Population	Employment	Population Ranking	Employment Ranking	Productions	Attractions	Productions Ranking	Attractions Rankings	Ranking Difference	Ranking Difference
West Lothian	158984	76672	10	8	12402	13034	9	8	1	0

TMfS: 07 Base Year Planning Data					PM Peak Hour Final Matrix					
Local Authority	**Population**	**Employment**	**Population Ranking**	**Employment Ranking**	**Productions**	**Attractions**	**Productions Ranking**	**Attractions Rankings**	**Ranking Difference**	**Ranking Difference**
Aberdeenshire	229679	75725	7	9	18988	22356	9	8	-2	1
Angus	107444	35137	19	22	8225	9347	22	21	-3	1
Argyll & Bute	88438	41707	23	19	8623	8806	21	23	2	-4
City of Aberdeen	213675	144460	8	3	28948	24956	6	7	2	-4
City of Dundee	144036	64194	13	12	15349	13463	12	15	1	-3
City of Edinburgh	458355	273513	2	2	61659	55390	2	2	0	0
City of Glasgow	585134	344560	1	1	69216	60656	1	1	0	0
Clackmannan	48099	15722	29	29	4451	5127	29	29	0	0
Dumfries & Galloway	145800	64696	11	11	15018	15119	14	13	-3	-2
East Ayrshire	116334	40740	16	20	10549	11767	18	16	-2	4
East Dunbartonshire	100124	26146	20	27	7740	9678	23	20	-3	7
East Lothian	90218	28577	21	24	7187	8668	24	25	-3	-1
East Renfrewshire	84248	20646	25	28	6741	8676	27	24	-2	4
England & Wales	-	-	-	-	2108	2107	30	30	-	-

TMfS: 07 Base Year Planning Data					PM Peak Hour Final Matrix					
Local Authority	**Population**	**Employment**	**Population Ranking**	**Employment Ranking**	**Productions**	**Attractions**	**Productions Ranking**	**Attractions Rankings**	**Ranking Difference**	**Ranking Difference**
Falkirk	144391	60897	12	13	17506	17997	11	11	1	2
Fife	341884	142829	3	4	34858	36705	3	3	0	1
Highland	277265	127088	6	5	29715	29878	5	5	1	0
Inverclyde	79069	36198	27	21	6931	7246	26	28	1	-7
Midlothian	76568	27817	28	26	6671	7968	28	26	0	0
Moray	86683	32122	24	23	8981	9210	20	22	4	1
North Ayrshire	132817	47293	15	16	12991	13704	15	14	0	2
North Lanarkshire	316770	119483	4	7	30467	32158	4	4	0	3
Perthshire & Kinross	136043	53720	14	14	15185	15379	13	12	1	2
Renfrewshire	167415	71223	9	10	18651	18284	10	10	-1	0
South Ayrshire	110070	47219	17	17	11643	11436	17	17	0	0
South Lanarkshire	296100	121417	5	6	27257	28952	7	6	-2	0
Stirling	82998	48821	26	15	11654	11146	16	18	10	-3
The Borders	107851	43922	18	18	10143	10706	19	19	-1	-1
West Dunbartonshire	89282	28566	22	25	7002	7326	25	27	-3	-2

TMfS: 07 Base Year Planning Data					PM Peak Hour Final Matrix					
Local Authority	Population	Employment	Population Ranking	Employment Ranking	Productions	Attractions	Productions Ranking	Attractions Rankings	Ranking Difference	Ranking Difference
West Lothian	158984	76672	10	8	19146	19393	8	9	2	-1

Appendix R – Census Travel-to-Work & Modelled Car Non-Work Commuters Analysis

Census Travel-to-Work (CTTW) by Sector

CTTW	Argyll & Bute	Ayrshire	Central	City of Aberdeen	City of Dundee	City of Edinburgh	City of Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	3229	8	213	10	0	7	150	3	43	9	9	5	2	3	132	1	3,826
Ayrshire	15	12046	70	28	2	24	722	80	71	12	6	29	4	2	1031	19	14,160
Central	272	47	12675	38	14	628	2940	4	60	317	8	584	12	126	1506	1	19,231
City of Aberdeen	1	1	2	8986	7	6	4	0	20	4	6	1	1027	1	2	1	10,069
City of Dundee	0	2	9	35	3759	18	4	0	7	140	21	7	294	180	6	1	4,481
City of Edinburgh	6	11	331	30	13	13940	144	11	60	473	8	2096	4	64	195	63	17,450
City of Glasgow	63	270	1215	30	5	170	11953	9	62	48	10	192	5	11	3622	2	17,668
Dumfries & Galloway	2	91	4	7	1	10	18	5583	360	3	2	3	2	0	30	18	6,134
England & Wales	64	58	76	227	35	152	220	146	0	75	67	93	94	28	251	145	1,733
Fife	28	5	343	54	451	877	52	0	49	12009	5	288	42	292	82	2	14,579
Highland	12	3	11	106	33	11	11	1	36	10	12280	6	160	32	10	0	12,722
Lothians	4	6	352	13	9	4719	133	1	55	164	2	9029	7	9	324	59	14,885
North East	6	3	9	4106	921	13	7	0	44	50	150	9	12174	114	9	1	17,615
Perthshire & Kinross	6	2	228	24	495	136	38	1	26	266	28	42	98	5280	46	2	6,718
Strathclyde	120	498	1209	49	4	384	7138	16	127	82	9	926	9	20	27397	13	38,000
The Borders	1	18	7	2	1	364	10	22	162	13	0	205	2	1	26	3488	4,323
Total	3,830	13,067	16,755	13,745	5,748	21,457	23,546	5,878	1,181	13,675	12,611	13,514	13,937	6,163	34,669	3,817	203,594

AM Peak Hour Modelled Car Non-Work Commuters (CNWC) Traffic by Sector

CNWC	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	3537	11	292	6	1	6	165	3	12	9	10	5	2	3	139	0	4,201
Ayrshire	18	14269	61	26	3	22	620	89	27	9	6	25	4	2	1107	22	16,309
Central	291	51	13717	37	18	839	3001	5	20	303	8	629	15	141	1618	1	20,692
Aberdeen (City)	1	2	4	9681	8	12	6	0	11	8	8	1	1279	2	4	2	11,028
Dundee	1	2	14	31	3850	36	5	0	4	180	16	12	309	193	8	1	4,661
Edinburgh	6	11	316	53	34	15836	115	17	18	597	8	2537	55	105	198	89	19,994
Glasgow	76	307	1372	34	9	205	12262	12	45	47	11	205	5	14	3880	2	18,485
Dumfries & Galloway	2	100	5	9	2	18	18	6128	82	3	1	4	3	1	52	22	6,451
England & Wales	9	11	16	61	10	34	38	42	0	18	14	23	28	7	54	59	423
Fife	24	4	377	64	658	1003	42	0	13	12937	7	354	61	336	80	3	15,964
Highland	13	3	14	91	35	16	13	1	15	13	13622	9	166	38	11	0	14,061
Lothians	2	9	398	21	20	5277	117	1	24	228	3	9679	13	13	355	81	16,243
North East	6	3	13	4593	937	40	10	0	13	88	163	16	13104	120	12	1	19,120
Perthshire & Kinross	6	2	254	21	520	176	38	1	10	310	23	54	102	5479	46	2	7,042
Strathclyde	138	619	1320	46	4	463	7282	17	47	85	9	1073	10	23	30813	14	41,963
The Borders	0	21	6	3	1	397	10	25	65	13	0	273	3	0	27	3589	4,434
Total	4,130	15,425	18,180	14,777	6,108	24,383	23,740	6,343	407	14,846	13,908	14,897	15,158	6,476	38,403	3,889	221,072

AM Peak Hour Modelled CNWC & CTTW Difference by sector

CNWC	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	308	3	79	-3	0	-1	14	0	-31	-1	0	-1	0	0	7	0	375
Ayrshire	3	2223	-9	-2	1	-2	-102	9	-44	-3	0	-4	-1	1	76	3	2,149
Central	19	4	1042	0	4	211	61	1	-41	-14	0	45	2	14	112	0	1,461
Aberdeen (City)	0	2	1	695	1	6	2	0	-9	4	2	0	252	0	1	1	959
Dundee	0	0	4	-3	92	19	1	0	-2	40	-5	5	15	13	2	0	180
Edinburgh	-1	-1	-14	23	21	1897	-29	6	-42	124	0	441	50	40	3	26	2,544
Glasgow	12	37	156	5	4	35	309	3	-17	-1	1	12	1	3	258	0	817
Dumfries & Galloway	-1	10	1	1	1	9	-1	546	-277	0	0	0	1	0	22	4	317
England & Wales	-56	-48	-60	-167	-26	-117	-182	-104	0	-57	-53	-70	-66	-21	-197	-86	-1,309
Fife	-4	-1	34	10	207	126	-10	0	-35	927	1	66	19	44	-2	0	1,384
Highland	1	0	3	-15	3	6	2	0	-21	3	1341	3	5	7	1	0	1,339
Lothians	-2	3	47	9	10	559	-16	0	-31	64	1	650	6	4	32	22	1,358
North East	0	0	4	486	16	27	3	0	-30	38	13	7	930	6	3	0	1,504
Perthshire & Kinross	0	0	26	-4	25	40	0	0	-16	44	-5	13	3	199	0	0	324
Strathclyde	19	121	111	-3	1	79	143	1	-81	2	-1	147	2	3	3416	1	3,963
The Borders	0	3	-1	1	0	34	0	3	-97	0	0	68	1	0	0	101	112
Total	300	2,358	1,424	1,032	360	2,926	194	465	-774	1,171	1,297	1,383	1,221	313	3,735	73	17,478

AM Peak Hour Modelled CNWC & CTTW % Difference of matrix total by sector

% Difference	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ayrshire	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Central	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
Aberdeen (City)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Dundee	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
Edinburgh	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.5%
Glasgow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%
Dumfries & Galloway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
England & Wales	0.0%	0.0%	0.0%	-0.1%	0.0%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	-0.7%
Fife	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Highland	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Lothians	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
North East	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%
Perthshire & Kinross	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	-0.1%
Strathclyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.3%
The Borders	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%
Total	0.0%	0.6%	0.0%	-0.1%	-0.1%	0.5%	-0.8%	0.0%	-0.4%	0.0%	0.1%	0.1%	0.0%	-0.1%	0.3%	-0.1%	0.0%

AM Peak Hour Modelled CNWC & CTTW % Difference in Travel Distribution by sector

% Difference	Argyll & Bute	Ayrshire	Central	Aberdeen (City)	Dundee	Edinburgh	Glasgow	Dumfries & Galloway	England & Wales	Fife	Highland	Lothians	North East	Perthshire & Kinross	Strathclyde	The Borders	Total
Argyll & Bute	10%	43%	37%	-35%	31%	-8%	9%	-2%	-71%	-9%	5%	-12%	10%	-5%	5%	-18%	10%
Ayrshire	19%	18%	-12%	-8%	51%	-9%	-14%	11%	-62%	-23%	1%	-14%	-15%	43%	7%	18%	15%
Central	7%	9%	8%	-1%	30%	34%	2%	16%	-67%	-4%	-3%	8%	20%	11%	7%	10%	8%
Aberdeen (City)	41%	332%	61%	8%	16%	95%	41%	0%	-45%	110%	37%	62%	25%	22%	58%	54%	10%
Dundee	48%	11%	45%	-10%	2%	104%	32%	0%	-37%	29%	-22%	65%	5%	7%	28%	15%	4%
Edinburgh	-13%	-6%	-4%	75%	163%	14%	-20%	60%	-70%	26%	2%	21%	1162%	63%	1%	41%	15%
Glasgow	20%	14%	13%	15%	83%	21%	3%	32%	-28%	-2%	11%	6%	12%	23%	7%	9%	5%
Dumfries & Galloway	-27%	11%	28%	20%	46%	89%	-3%	10%	-77%	13%	-16%	12%	29%	32%	76%	21%	5%
England & Wales	-87%	-82%	-78%	-73%	-73%	-77%	-83%	-71%	0%	-76%	-80%	-76%	-70%	-74%	-79%	-59%	-76%
Fife	-13%	-20%	10%	19%	46%	14%	-19%	-6%	-72%	8%	21%	23%	46%	15%	-2%	21%	9%
Highland	8%	11%	32%	-14%	8%	54%	19%	13%	-58%	29%	11%	49%	3%	21%	11%	-29%	11%
Lothians	-43%	55%	13%	68%	109%	12%	-12%	20%	-57%	39%	38%	7%	84%	41%	10%	38%	9%
North East	-2%	16%	46%	12%	2%	202%	43%	11%	-70%	75%	9%	82%	8%	5%	40%	21%	9%
Perthshire & Kinross	2%	-7%	11%	-15%	5%	29%	-1%	-14%	-61%	17%	-18%	31%	4%	4%	1%	-11%	5%
Strathclyde	16%	24%	9%	-5%	24%	21%	2%	6%	-63%	3%	-6%	16%	23%	17%	12%	7%	10%
The Borders	-47%	17%	-20%	35%	30%	9%	-4%	13%	-60%	-1%	-13%	33%	48%	-36%	2%	3%	3%
Total	8%	18%	9%	8%	6%	14%	1%	8%	-66%	9%	10%	10%	9%	5%	11%	2%	9%

MVA Consultancy provides advice on transport and other policy areas, to central, regional and local government, agencies, developers, operators and financiers.

A diverse group of results-oriented people, we are part of a 500-strong team worldwide. Through client business planning, customer research and strategy development we create solutions that work for real people in the real world.

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