



# **TRANSPORT SCOTLAND**

## **LAND USE AND TRANSPORT INTEGRATION IN SCOTLAND (LATIS)**

**Commission Progress Report - 2012 – 2015**



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# 1 LAND USE AND TRANSPORT INTEGRATION IN SCOTLAND

## 1.1 Introduction and this Report

1.1.1 This Report summarises the work of the Land Use and Transport Integration in Scotland (LATIS) service in the financial years commencing April 2012 through to the end of March 2015.

1.1.2 Land-use And Transport Integration in Scotland (LATIS) is a service offered by Transport Scotland to assist with the appraisal of transport policies and programmes. LATIS aims to support robust evidence-based planning and the modelling and appraisal of proposed transport interventions.

1.1.3 The LATIS service is operated by Transport Scotland with the objective to meet the appraisal and modelling needs of the Scottish Government, project teams within Transport Scotland, and external organisations. It supports “robust investment planning and decision-making processes” and helps “to deliver our Development Planning responsibilities” as outlined in the [Corporate Plan](#).

1.1.4 LATIS has the following elements:

- **Models:**  
LATIS manages the development, maintenance and application of national and regional transport models and a national land use model. This is supported by a Library of reports.
- **Planning support:**  
The collection and provision of planning data and support to Development Planning and Management Transport Appraisal.
- **Data Collection:**  
The collection of transport and travel data and other user specified data through the use of the Data Collection Contract and the provision of model output data to transport and development planners and modellers. The Scottish Trip End Programme provides trip-end data for transport planning.
- **User Engagement:**  
An on-going programme of consultations and discussion events on a range of issues, including the development and application of transport and traffic models, the role of integrated transport and land use modelling, how best to support to strategic land use planning and how to improve data quality.

1.1.5 The LATIS service has supported the work of a range of organisations in addition to Transport Scotland over the period of this commission. It is considered that this illustrates the value of investment in both the LATIS capabilities and the user engagement to maintain and broaden the user base. To date, users of the LATIS service include:

- Transport Scotland
- Regional Transport Partnerships
- Network Operators
- Consultants
- Data Collection Companies
- Universities

## 2 THE LATIS COMMISSION

### 2.1 Introduction

2.1.1 The LATIS service, while managed internally by Transport Scotland, is delivered by means of Framework contracts held between Transport Scotland and a number of commercial consultancy firms [hereafter referred to as Framework Participants]. The structure of the LATIS Commission is shown in the table below together with the date at which the contract became live:

Contract	Consultants	Agreement concluded	
Lot 1	Maintenance and Enhancement of the Transport Model for Scotland	SIAS Ltd. (1), Jacobs Ltd. (2), MVA Consultancy Ltd. (3)	May 2012
Lot 2	Application of the Transport Model for Scotland	Jacobs Ltd. (1), MVA Consultancy Ltd. (2), AECOM (3)	May 2012
Lot 3	Transport Economic and Land Use Model for Scotland	David Simmonds Consultancy Ltd.	September 2012
Lot 4	Traffic and Transportation Auditor and Advisor	CH2M Hill Halcrow Ltd. (1), AECOM (2), SIAS Ltd. (3)	October 2012
	Data Collection	Sky High Count on Us Limited (1), Streetwise Services Limited (2), Amey OW Limited (3)	September 2012

2.1.2 The LATIS commission is due to expire in May 2016.

2.1.3 For the purposes of this document, and to better understand each Framework Participant's role, each contract is referred to as follows.

- Lot 1: TMfS Model Development / Developer / Developers
- Lot 2: TMfS Model Application / User / Users
- Lot 3: Land-Use Modelling
- Lot 4: Model Auditor and Data Collection

2.1.4 The objectives of the LATIS Commission are outlined in the tables for each contract or "Lot" and the progress made against each objective is presented in Appendix A of this document.

2.1.5 The multiple Framework Participant model was adopted to provide more options for service delivery and to increase the depth of knowledge and participation in the LATIS service within the Scottish transport modelling community.

### 2.2 LATIS Management

2.2.1 Transport Scotland seeks to manage the LATIS service to ensure it meets the needs of users while also achieving technical excellence. The management of the Commission was facilitated by scheduled meetings and reports as follows:

- LATIS Commission Inception Meetings
- LATIS Progress Meetings (as follows)
- LATIS Commission Inception Report (Lots 1 & 2)
- TELMoS Inception Report (Lot 3)
- Traffic Advice and Auditor (Lot 4) Inception Report

- 2.2.2 Changes have been made to the operation of the LATIS team in Transport Scotland and sharing of information between LATIS consultants and Transport Scotland as detailed below.

#### ***LATIS team***

- 2.2.3 Transport Scotland has appointed staff to manage each LATIS contract. These individuals have defined responsibilities, clear communication lines and their performance is critical to the delivery of the service. They are also the key point of contact for LATIS consultants, improving coordination and control, and ensuring project needs are both understood and met.
- 2.2.4 Each consultant has a key commission contact which allows efficient communication with Transport Scotland.

#### ***Data Sharing***

- 2.2.5 An online file storage and sharing system is used. This provides for collaborative editing of documents, readily permits data sharing and information transfer between LATIS consultants.
- 2.2.6 A key advantage of the use an online data sharing system is the ability for all consultants to monitor and contribute to management reporting documentation online such as Version Control, an Issues Log and a Risk Register. These “live” documents mean that consultants responsible for the application of a model or testing of a scheme can identify and use the latest and/or most appropriate version of each transport model.
- 2.2.7 Additional benefits include the ability to monitor the latest versions of models and modelled scenarios as well as model issues encountered by LATIS consultants using automatic alerts. This also enables the sharing of links to a variety of data and maps.
- 2.2.8 The LATIS online data sharing system was updated to include all relevant documents and is available to all Framework Participants (FPs). The roll-out of the online data sharing system has been reviewed by Transport Scotland and feedback from all FPs has been incorporated to improve the system to ensure efficient transfer of knowledge and data.

### **2.3 Communications and Engagement**

- 2.3.1 The LATIS Service aims to engage with transport planners and the wider transport modelling community through a variety of methods, direct and indirect. This is essential for the promotion of the LATIS service and its capabilities. Communication is also fundamental to the management and coordination of work done by Commission consultants.

#### ***Website***

- 2.3.2 The LATIS website was replaced prior to the start of the new Commission with a micro-site within the main Transport Scotland website, however, it was imperative that those unfamiliar with LATIS could still find and access information about models and data and reporting. The [www.latis.org.uk](http://www.latis.org.uk) domain name has been retained and directs to the website at [www.transportscotland.gov.uk/latis](http://www.transportscotland.gov.uk/latis) .
- 2.3.3 The content of the website is maintained regularly and the Transport Scotland website has been designed to comply with the international web accessibility standards issued by the World Wide Web Consortium (W3C). Under these requirements some media, for example presentations from User Groups are no longer available through the website directly however Transport Scotland can provide them on request.

#### ***Reporting***

- 2.3.4 An objective of improved communications has been to develop a consistent style for documentation and reporting which reflects the LATIS Commission structure, the type of information being communicated and strengthens the LATIS brand both within Transport Scotland and externally. Templates were developed with the LATIS logo and were used, where relevant, by all LATIS consultants during the Commission.

- 2.3.5 Key Commission reports have been prepared in this style and published on the website where appropriate. Commission procurement documentation also adopts the LATIS style.

***LATIS Progress Meetings***

- 2.3.6 Progress meetings are held monthly with the consultants serving under the LATIS Commission. Consultants invited if they are actively working on projects or working with other consultants in the delivery or application of models.
- 2.3.7 Regular meetings are held with data collection consultants to discuss completed, on-going, and forthcoming data collection work.
- 2.3.8 In addition, ad-hoc progress meetings are held between selected consultants and any other interested party should the need arise.
- 2.3.9 Weekly technical meetings are held between Transport Scotland and the relevant consultant where programme dependant work streams are being progressed under the LATIS commission.

***Appraisal and Modelling User Group***

- 2.3.10 The User Group is a great opportunity to inform and promote the LATIS service and Scottish Transport Appraisal Guidance, and to gain feedback and learn from users, transport planning practitioners, and other commissioning authorities. The User Group is an annual event.
- 2.3.11 In the first commission year, the User Group was held on 19 June 2012 in The Lighthouse, Glasgow. In addition to outlining how the new LATIS Commission was anticipated to operate and potential innovations in the service, there was a discussion of alternative forecast scenarios and a workshop event on issues associated with data collection, collation, and dissemination.
- 2.3.12 A second LATIS User Group Meeting was held on 8 October 2013 in The Trades Hall, Glasgow. The TMfS Model Developers presented what was new in the National Transport & Land-use Models, forecast Do-Minimum development and future technical direction including long-distance modelling enhancements and efficiency improvements were all discussed.
- 2.3.13 In 2014, the LATIS User Group Meeting was held on 25 November in The Lighthouse, Glasgow. Updates to TMfS, TELMoS, and data sharing with Transport Scotland were presented and discussed.
- 2.3.14 The attendance at each event has been diverse with growing interest from academics, Local Authorities and Regional Transport Partnerships.

### **3 TRANSPORT AND LAND USE MODELLING**

#### **3.1 Introduction**

- 3.1.1 Transport Scotland has developed, through the LATIS commission, a hierarchy of transport models; both national, regional and where required local models.
- 3.1.2 These appraisal tools include national integrated land use and transport models which cover the whole of Scotland. These national models comprise the Transport Model for Scotland (TMfS) and the Transport, Economic, and Land-use Model of Scotland (TELMoS).
- 3.1.3 The national transport model, [Transport Model for Scotland \(TMfS\)](#) offers a generalised, multi-modal representation of travel demands and infrastructure supply for a base year and future forecast years, typically at 5 year intervals up to 25 years beyond the base year.
- 3.1.4 The national land-use model, [TELMoS](#) (Transport and Economic Land-use Model of Scotland), provides independent demographic, planning and economic forecasts which form the basis for future travel demands.

#### **3.2 Background to LATIS**

- 3.2.1 In 2006 Transport Scotland commissioned the TMfS Term Commission for the Maintenance and Enhancement of the Transport Model for Scotland (TMfS) and Transport Economic and Land-Use Model of Scotland (TELMoS).
- 3.2.2 A central element of the Commission was to develop and deliver an enhanced land-use and transport modelling system. A hierarchical modelling framework was developed, 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 as the lower tier.
- 3.2.3 In 2012, the LATIS Term Commission was re-commissioned and has evolved to meet the on-going modelling requirements of the Scottish Government, project teams within Transport Scotland itself and external organisations.
- 3.2.4 The following sections describe the Transport and Land Use Models which Transport Scotland either maintains or works in partnership through the Regional Transport Partnerships.

#### **3.3 Transport Model for Scotland (TMfS)**

##### ***TMfS07***

- 3.3.1 In 2008, Transport Scotland commissioned consultants to create an enhanced version of the Transport Model for Scotland (TMfS). This National Model, TMfS07, was a multi-modal model covering Scotland's strategic transport system and sits at the top of a model hierarchy which would feed into more detailed regional and local models.
- 3.3.2 TMfS07 was calibrated to a 2007 base year, with standard forecast years of 2012, 2017, 2022, 2027, and 2032.
- 3.3.3 Planning data, collected from local authorities, forms the basis of the TMfS07 forecast year data. This data is input to the Transport and Economic Model of Scotland (TELMoS) and used to generate future year traffic and travel forecasts within the National Model. The development of TELMoS is described below.

##### ***TMfS12***

- 3.3.4 During this reporting period, there were a range of motivating factors which prompted the creation of TMfS12 including the desire to update from the current TMfS07 base year of 2007 to 2012 which included the impacts of the recession, the opening of major infrastructure schemes (e.g. M80, M74 Completion, Airdrie-Bathgate rail, etc.) between 2007 and 2012 and the need to focus development for the imminent application of the model. TMfS12, was developed to enable it to be applied to specific scheme assessments, particularly for those relating to the Perth-Inverness and Aberdeen-Inverness corridors.



3.3.5 Within the project timetable and subject to the availability of data, a number of additional enhancements and improvements were also implemented in TMfS12. In summary, the updates incorporated in TMfS12 comprised the following:

- Updates to the Road network reflecting 2012 conditions.
- Limited Updates to the 2012 PT network / timetable / service information.
- Refinements to zoning system for the assignment models (e.g. on Perth-Inverness and Aberdeen-Inverness corridors).
- Incorporation of additional RSI data not previously included in TMfS07.
- Use of additional automatic count information for calibration/validation (e.g. from SRTDb).
- Use of additional journey time, flow and PT information for model calibration/validation.
- Modifications to the demand model to reflect the 2012 updates.
- Appropriate sensitivity and robustness testing.
- Model calibration and validation reports for the roads, PT and demand models.
- Forecast network/planning scenarios for agreed future years of 2017, 2022, 2027, 2032, and 2037.

3.3.6 TMfS12 was calibrated to a 2012 base year and released in autumn 2013 using standard forecast years of 2017, 2022, 2027, 2032 and 2037.

#### ***TMfS14***

3.3.7 Transport Scotland have commissioned the creation of TMfS14 which will continue the ongoing improvements required for the scheme assessments, on the Perth-Inverness and Aberdeen-Inverness corridors. The Road and Public Transport network will be updated to reflect 2014 conditions and utilised substantial additional flow data collected in the 2012-2014 period.

3.3.8 This update will also take account of recently collected Bus and Rail trip data collected on the Perth-Inverness and Aberdeen-Inverness corridors. The development of this model takes advantage of the 2011 census Travel to Work data which Transport Scotland and the National Records of Scotland worked together to provide for this update.

3.3.9 The demand model will be calibrated and will include additional refinement to improve the fidelity when considering pay/free parking in cities and the segmentation of the population by income and how this impacts on travel behaviour. The Park and Ride model will also be calibrated to include recently collected data across Scotland.

3.3.10 The appropriate sensitivity and robustness testing will be undertaken and the relevant model development reports will be provided for the Roads, PT and Demand models. Following the completion of the 2014 Base model, Forecast network/planning scenarios for agreed future years will be developed for use within future studies.

3.3.11 The TMfS14 base model is due to be completed in December 2015.

### **3.4 Land Use Model Development**

#### ***TELMoS07***

3.4.1 TELMoS07 was commissioned in 2008 and was an application of the DELTA land use modelling package. It had a base year of 2007, a revised zone and Area structure, updates to the data inputs to reflect the most recent information that was available and some technical enhancements that incorporated new DELTA functionality that had not previously been implemented within earlier versions of TELMoS.

### ***TELMoS12***

- 3.4.2 TELMoS12 was commissioned in 2012. It was an update of TELMoS07. It has a revised base year of 2012, a forecast period that extends to 2037, a new economic scenario based upon a CEBR economic forecast of employment change, a new demographic scenario based upon the 2010 NRS population projection, updated input on the scale and a distribution of planned development which was collected from the local planning authorities in 2012.
- 3.4.3 The model was calibrated so that the base year inputs were consistent with the first release of results from the 2011 Census. These described local authority demography. At the time of model construction, these were the only Census results that were available.
- 3.4.4 TELMoS12 is designed to operate in conjunction with TMfS12 to produce Land Use and Transport Interaction facility within the LATIS model hierarchy.

### ***TELMoS14***

- 3.4.5 TELMoS14 will be an updated version of the TELMoS forecasting model. It was commissioned in 2015. TELMoS14 will have a base year of 2014 and a 25 year forecast period.
- 3.4.6 The model design includes several enhancements. These were identified in the LATIS Lot 3 Inception Report and subsequent Model Development Report. They include improvements to the modelling of development, an option for a variable economic scenario, the better modelling of ports and airports, improved modelling of cross border interaction with the North of England and the option of an interface to regional transport models.
- 3.4.7 The model has a revised zone and area system, with additional zones along the A9 and A96 corridors and to represent the main ports. The Areas will be based upon the 2011 Travel to Work Areas. The model definitions for households and economic activities have been revised to reflect the new definitions of the 2011 Census and the economic forecasts.
- 3.4.8 The new 2014 base year database has drawn heavily upon 2011 Census tables. The key inputs for future years include a new economic scenario, a demographic scenario based upon the 2012 NRS population and households projections and details of planned development that were provided by the planning authorities in 2014.

## **3.5 Regional Transport Models**

### ***Central Scotland Transport Model (CSTM12)***

- 3.5.1 In 2013, Transport Scotland commissioned the development of the Central Scotland Transport Model version 2012 (CSTM12).
- 3.5.2 CSTM12 was developed to provide a strategic multi-modal travel demand model within central Scotland, that would sit within the LATIS modelling hierarchy below the national 'Transport Model for Scotland' (TMfS). The model is required to provide analytical evidence in support of a wide range of potential scheme and policy interventions within the central belt of Scotland.
- 3.5.3 The primary requirement of CSTM12 is to consider the appraisal of improved transport connectivity between Edinburgh and Glasgow, particularly relating to potential public transport improvements. The initial application of CSTM12 helped inform the High Speed Rail Scotland Appraisal project, which considered high speed and conventional transport improvements between Edinburgh and Glasgow. During the development of this model, it was acknowledged that further development of the road model was required as part of the next upgrade.
- 3.5.4 The CSTM12 development was based on the original model structure of TMfS07. The road and public transport models were updated to represent 2012 transport infrastructure provision and calibrated to 2012 traffic volumes and public transport passenger demand. The zone system was disaggregated to provide more detail with particular emphasis on railway stations. Public transport matrices were developed using LENNON rail passenger ticket data, with a separate journey purpose to cover concessionary travel movements.
- 3.5.5 The forecasting procedures include updated Trip Generation modelling, and re-calibrated Park & Ride and Demand Models. CSTM12 utilises CUBE Voyager Software.

### ***SEStran Regional Model (SRM12)***

- 3.5.6 In mid-2011, the SEStran Regional Model (SRM) was updated and enhanced by Transport Scotland to facilitate application of the model to appraise the Strategic Development Plan for the area (SESplan). This incorporated latest planning policy and improved the representation of the model zones and key junctions along the A720 Edinburgh Bypass.
- 3.5.7 The SRM has been further updated to represent 2012 travel conditions and align it with the National model hierarchy 2012 base years (e.g. of TMfS12 and CSTM12) – thus creating the ‘SRM12’. The main focus of the SRM12 development programme is to help inform the SESPlan Cross Boundary Appraisal Study. This study aims to understand the potential Cross Boundary impacts associated with the delivery of the SESPlan Strategic Development Plan (SDP), and understand the effectiveness of proposed transport investment options.
- 3.5.8 The SRM12 model development includes road network modelling improvements to consistently represent 2012 infrastructure provision and travel conditions. Road network detail is now more extensive, and there is also a greater level of zonal detail, including specific zones to represent major new development areas. The existing 2007 travel matrices (for both road and public transport) were disaggregated to the new zone system, and updated to reflect changes in travel demand and changes in demography and business activity that have occurred between 2007 and 2012. The 2012 assignment models were calibrated and validated to observed conditions. The road model development included comparison with TomTom Satellite navigation journey time data and 2011 Census travel to work data sets. The public transport model includes comparison with recently observed bus and rail passenger volumes.
- 3.5.9 The SRM12 continues to apply the existing modelling procedures with respect to Assignment, Demand, Public Transport and Park & Ride, with each component re-dimensioned to reflect the new zone system and match the 2012 calibration of the base year road and public transport models. Forecasting procedures were supplemented to provide additional functionality for representing new areas of proposed development.

### ***Moray Firth Transportation Model***

- 3.5.10 The Moray Firth Transportation Model (MFTM) is a multi-modal transport model of the Inverness travel-to-work catchment area and is developed and maintained by Highland Council. The model provides the facility for detailed regional transport analysis in and around the Moray Firth area.
- 3.5.11 An independent review of the model was undertaken on behalf of Transport Scotland through the LATIS commission to advise on the requirements to ensure the model could be used to appraise enhancements to the A96, and is currently enhancing the representation of the model in the corridor between Inverness and Nairn.
- 3.5.12 A LATIS Commission consultant recently created an inter-peak time period model to complement the existing morning and evening peaks. The new 2009 Inter Peak model is currently being used for work on the A96 where limited recalibration and improving the calibration of minor roads around Nairn is being undertaken.

## **3.6 Model Development Progress**

- 3.6.1 Throughout the period between May 2012 and December 2015 there have been a wide range of challenging model development activities progressed by the LATIS team.
- 3.6.2 The Model Development has been progressed for a variety of different reasons whether it be the requirement of upcoming scheme appraisal combined with utilising recently collected data or the availability of 3rd party data e.g. 2011 census data.
- 3.6.3 The model development tasks that have occurred during the current LATIS commission is detailed in Appendix B.

## 4 MODEL APPLICATION

### 4.1 Overview

4.1.1 LATIS provides robust quantitative evidence on the impact of a scheme or policy which, in turn, helps to determine the manner in which each particular intervention will contribute towards meeting the Scottish Government's National Indicators and serving its Purpose. This section will review applications of LATIS during the Annual Report period of 2012 to 2015.

### 4.2 Objective Progress

4.2.1 The LATIS objectives under the TMfS Model Application commission stated:

***Apply existing models (TMfS, any second tier models and/or other models in which the Employer has an interest)***

***Use of models within the LATIS service to:***

- ***support development planning***
- ***model the impacts of national transport or land use policies***
- ***model the impacts of any road or rail scheme, or combination thereof***

***For each model use:***

- ***Advise on the most appropriate model for the task***
- ***Define the scope of the study area***
- ***Prepare a report***
- ***Present the results to decision makers/stakeholders***

4.2.2 There have been a wide range of applications of LATIS throughout the reporting period, including several studies of national importance. Of particular importance has been the role of LATIS in supporting the planning reform process – the modelling capability has been used to provide evidence for a large number of baseline assessments to support strategic and local plan preparation.

### 4.3 Transport Applications – National models

4.3.1 This section provides an overview of applications undertaken using the LATIS service from the period 2012 – 2013, 2013 – 2014, and 2014 – 2015. Each application is listed in the following tables detailing the client, user, model, and description of the study.

4.3.2 The active Model Application Tasks for the Period May 2012 – May 2013 are shown as follows.

Application	Description	Model	Model User	Ultimate Client
Noise Modelling	Use TMfS to provide inputs to calculate 18 hour AAWDT, % HGVs and average speeds for use in the noise modelling. This will use TMfS outputs, multiplied by factors calculated from SHS and SRTDb.	TMfS:07	AECOM	Transport Scotland
A89 Bargeddie Slip / M8 Baillieston High Loop	To provide delay information prior to refurbishment works beginning on the bridge joints at Baillieston. The proportion of NB and SB M74 vehicles will be calculated.		AMEY	Transport Scotland
Health Externalities of Traffic Related Pollution in the Short and Long Run	Information on changes in traffic congestion as a pollution measure on a fine geographic scale. This information will allow for a comparison of households or neighbourhoods that are more exposed to traffic-related pollution to households or neighbourhoods that are less exposed.	LATIS Data	University of Stirling	Academic Interest
A737 Dalry Bypass Stage 3 Assessment	The use of TMfS forecasting to provide environmental data and undertake a traffic and economic appraisal of the Dalry Bypass scheme. The data will be used to inform a more detailed local S-Paramics model.	TMfS:07	SIAS Ltd.	Transport Scotland
A904 Grangemouth Road S-Paramics Modelling	To provide traffic forecasting for the design years of 2014 and 2022 using a cordoning process. The information will then be input to a more detailed S-Paramics model.	TMfS:07	SIAS Ltd.	Falkirk Council
A77 Maybole Bypass	TMfS will be used to estimate the predicted growth in traffic on the A77 for 2018, 2022 and 2013. This information will then be used in an economic forecasting assessment.	TMfS:07	AMEY	Transport Scotland
A9 Keir to Luncarty Study	To investigate the current and potential issues within the corridor and to recommend a strategy to address these that meets the requirements of STPR, IIP and developing LDP	TMfS:07	Transport Scotland (MTRIPS)	Transport Scotland
HS2: PLANET Modelling Framework Improvement	Use to TMfS to extract information on zone plans, zone sectors, highway travel demand and a range of model factors such as car occupancy, peak to period and period to daily.	TMfS:07	MVA Consultancy	Atkins
Glasgow Airport Strategic Transport Appraisal	Use the modelling suite to extract the generalise cost of different modes of transport for key origins with a destination at Glasgow Airport.	TMfS:05	AECOM	Transport Scotland
Inverurie Local Plan Testing 2016:2023	To obtain information on forecasting the external to external movements through Inverurie which will be used to inform the overall forecasting methodology. This will then be used in a more detailed S-Paramics model.	TMfS:07	SIAS Ltd.	Aberdeenshire Council
A77 Meiklewood to Smithston Study	To obtain observed traffic flow data for use in the study to improve journey time reliability and sustainability in design and construction.	LATIS Data	Halcrow	Transport Scotland
A9 Kincaid to Dalraddy DMRB Stage 3 Assessment	To inform future traffic growth assumptions along the A9 through the study area as part of providing a stage 3 assessment of the dual carriageway upgrade.		Atkins Ltd.	Transport Scotland

4.3.3 The active Model Application Tasks for the Period May 2013 – May 2014 are shown as follows.

Application	Description	Model	Model User	Ultimate Client
Transport Carbon Mitigation in TACTRAN Area	To identify the potential scale of carbon mitigation impact of identified options and prioritise between them.	TmFS	Atkins Ltd.	TACTRAN
A9 Keir to Luncarty Study	To investigate the current and future potential issues within the corridor and to recommend a strategy to address these.		Transport Scotland, MTRIPS	Transport Scotland
Commonwealth Games Spectator and Workforce Modelling	Enhancement to an existing gravity model which is currently used to provide a library of distributions to a spectator access model	TmFS:07	AECOM	Glasgow 2014 Ltd.
A9 Professional Engineering Services	Establish the area influenced by dualling the A9 and A96, and establish the potential wider economic benefits of dualling each	TmFS:07	Jacobs	Transport Scotland
ICT Impact on Scotland's Regions	Assess the impact on congestion and emissions of a range of feasible ICT solutions	TmFS:07	Napier University	COMPASS FP7-Project
Assessment of Existing Bridges & Highway Infrastructure in the UK	To look at the issues involved in the development and use of Eurocodes for the assessment of Highway Structures by		Manchester University	Manchester University
Glasgow 2014	To use data to assist in the planning of transport services during Glasgow 2014. By providing such specific data sets, interrogation of the data will allow informed decisions about the capacity issues, demand and highlight any potential issues.	Data	Glasgow 2014	Glasgow 2014 Ltd.
A9 HGVs	The number of HGVs using the A9 per day.	Data	Transport Scotland (Rail Directorate)	Transport Scotland
A96 Dualling		Data	Moray Council	Moray Council
A9	Traffic flows on the A9 north of Pitlochry		Cairngorms (CNPA)	
Glasgow 2014	RSI Data	CSTM12	Glasgow 2014	Glasgow 2014 Ltd.
Ongoing Advice & Assistance to First Group	Review travel behaviour/demands across Scotland to consider inter-city travel patterns	TmFS	Ove Arup & Partners Ltd	First Group
Glasgow Airport Transport Appraisal Part 2 Study	To carry out a robust transport appraisal of transport interventions to meet growing demand at Glasgow Airport 2040.	CSTM12	AECOM	Glasgow Airport/Transport Scotland
Stirling LDP Testing	Utilise TmFS forecasts to inform the microsimulation model of Stirling. Cordon matrices will be required from TmFS12 for	TmFS	SIAS Ltd.	Stirling Council
Rail Integration - Qualitative research	To determine where intervention could be targeted on Scotland's transport network to improve integration between rail and other		Transport Scotland	Transport Scotland
Inverurie LDP Testing	Utilise TmFS forecasts to inform the forecasts of a microsimulation model of Inverurie. Cordon matrices will be required	TmFS	SIAS Ltd.	Aberdeenshire Council
Kintore LDP Testing	Utilise TmFS forecasts to inform the forecasts of a microsimulation model of Kintore.	TmFS	SIAS Ltd.	Aberdeenshire Council

4.3.4 The active Model Application Tasks for the Period May 2014 – December 2015 are shown as follows.

Application	Description	Model	Model User	Ultimate Client
Trip Purpose Analysis	Description of the make up of traffic by journey purpose for various roads in Scotland		Transport Scotland	Transport Scotland
Kilwinning STAG Study	Traffic count data to help identify and evaluate options for managing traffic within the Kilwinning area.	TMfS	SIAS Ltd.	North Ayrshire Council
Greater Glasgow Infrastructure Fund	Economic modelling to appraise the impact of infrastructure investments on GVA and employment outcomes	TELMoS	KPMG	Glasgow City Council
Scotrail Franchise Tender	To develop a robust evidence based analytical approach to derive forecast patronage and fares revenue for a series of rail initiatives	TELMoS	Systra Ltd.	National Express
Traffic Data for Kier Roundabout	To update a transport planning tool to validate the 2012 Stirling Base S-Paramics model	Data	SIAS Ltd.	Stirling Council
A82 Tarbet to Inveraman Upgrade		Data	CH2M Hill	Transport Scotland
Scotrail Franchise Bid	Require a car based pure time skims for a base and forecast year using TMfS12. This will inform the competitive position of car and bus against train services in terms of travel times	TMfS	Systra Ltd.	National Express
Access to Laurencekirk	To undertake an objective led appraisal to derive a preferred solution for Access to Laurencekirk including access to/from the A90. Data from TMfS will be used to develop future year demands and traffic patterns analysed.	TMfS	CH2M Hill	NESTRANS
Scotrail Franchise Tender	To develop a robust evidence based analytical approach to derive forecast patronage and fares revenue for a series of rail initiatives	TELMoS	Systra Ltd.	National Express
Callander LDP Testing	Utilise TMfS forecasts to inform the forecasts of LINSIG model of Callander. Cordon matrices will be extracted from TMfS assignments for each modelled year.	TMfS	SIAS Ltd.	Loch Lomond and the Trossachs National Park Authority
Greater Dublin Area Model	Use RSI data to assess the trip length distribution for local goods vehicles movements	Data?	SKM	Udaras Naislunta Iompair
An Assessment of the Car Parks from Aberdeen City by using GIS Techniques	To evaluate if the car parks are enough to meet the needs of the drivers and to develop a scenario to see which car parks will be chosen.	Data	University of Aberdeen	University of Aberdeen
A82 Tarbet to Inveraman Upgrade	The results of the impact of the A9 dualling on traffic flows on the A82	Data/TMfS	CH2M Hill	Transport Scotland
A9 Dualling: Luncarty to Pass of Birnam	Use TMfS to forecast future year traffic levels on the A9 between Luncarty and Pass of Birnam for the purposes of carrying out the highway design, environmental assessment and economic assessment of the upgrade	TMfS	Jacobs	Transport Scotland
Oudenarde and Newburgh Feasibility Study	Using CSTM12 to model results and economic benefits associated with various rail scenarios	CSTM12	Systra Ltd.	SEStran
Airdrie to Bathgate Rail Link Evaluation	Use available passenger survey data for the Airdrie to Bathgate line to inform the evaluation	Data	CH2M Hill	Transport Scotland
Access to Laurencekirk	To facilitate a data gathering exercise which will contribute to the analysis of problems, opportunities, issues and constraints section of a STAG report.	Data	CH2M Hill	NESTRANS



Application	Description	Model	Model User	Ultimate Client
Kincardine S-Paramics Model Update	The suite of National Transport and Land-Use models will be utilised to investigate and assess the wider area impacts of planned maintenance works on the Kincardine Bridge. A local assessment will then be undertaken using S-Paramics.	TMFS	SIAS Ltd.	Transport Scotland
A737 Improvements at Beith (MTRIPS)	to provide available forecast demand data or growth factors for future year scheme assessment	TMFS	Amey	Transport Scotland
Fife Development Plan Assessment	SRM will be utilised to provide traffic forecasts for the Fife Local Development Plan.	SEStran Regional Model	SIAS Ltd.	Fife Council
SCT3917 Clyde Gateway Strategic Roads Assessment and Strategy Modelling	CSTM12 will be used to develop subareas of 5 corridor models to be used as prior matrices for the calibration of the base models.	CSTM12	JMP	Clyde Gateway Urban Regeneration Company
Anniesland Chord	To understand the generalised journey time benefits of providing a chord at Anniesland which would allow for some trains between Edinburgh and Glasgow to be diverted via Queen Street low level whilst refurbishment works is carried out at Queen Street High Level.	CSTM12	Network Rail	Network Rail
A803 Corridor STAG	To use CSTM to explore the possibilities of developing various options as part of a Multi-Model STAG Part 2 Appraisal of the Kirkintilloch/Lenzie - Bishopbriggs - Glasgow Corridor	CSTM12	AECOM	East Dumbartonshire Council
Modelling Railway Station Choice using Geographical Information Systems (GIS)	to explore the factors that influence railway station choice decisions made by passengers.	Data	University of Southampton	University of Southampton
A8/A89 Corridor Study	To obtain baseline traffic movements along the corridor in the shape of OD matrices by vehicle type for implementation to a microsimulation model of the corridor.	SEStran Model	AECOM	City of Edinburgh Council & West Lothian Council
Barkit Moor	A9 Activity Centre	Data	Transport Scotland	Transport Scotland



## 5 DATA COLLECTION

### 5.1 Introduction

5.1.1 This section outlines how we use data, capture, store, and ensure the quality of data for LATIS modelling and wider appraisal work.

### 5.2 How we use data

5.2.1 Data underpins all that the LATIS Commission does and every project undertaken by Transport Scotland. The LATIS models utilise a wide range of data, from both observed and secondary sources, for calibration and validation. The scope of the LATIS Commission is wider than ever and, as a result, draws not only on existing data resources within Transport Scotland but from new and emerging data sources to undertake the work.

5.2.2 The value of data is derived in part from its structure, in part from its application. While data may be collected with clear project-based objectives, its value may extend far beyond that.

- Data
  - Policy Assessment
    - Modelling framework
    - Appraisal
  - Policy Development
    - Business cases

5.2.3 Data is collected from a number of sources, principally through the Data Collection commission. The process of capture, quality assurance, storage and dissemination is outlined as follows.

### 5.3 Data capture

5.3.1 In the period covered by this Report, the LATIS service has captured data from a number of sources as shown below.

Observed	Modelled	Purchased	Internal
LATIS Commission	LATIS model runs	INRIX (MapMechanics)	National Transport Database Service (NTDs) (Traffic Scotland)
Local Authority Data	Other model outputs	Tom Tom	Ordnance Survey mapping
Scotland Excel		DfT Rotating Link Census	LIDAR
		DfT National Trip End Model (NTEMTEMPRO)	IRIS (infrastructure Roads Information Service) and CAD mapping
			National Concessionary Travel Scheme database
			Rail Franchise Performance Reporting

5.3.2 The LATIS “Commission for the Collection and Collation of Transport and Land Use data” has three suppliers:

- Sky High Plc (incorporating former Count on Us Limited and now part of the Tracsis Group)
- Streetwise Services Ltd
- Amey

#### **Observed**

5.3.3 The Commission is used primarily for the collection of observed data in the following forms:

- Link counts
- Junction turning counts

- Origin-destination or overtaking behaviour capture by Automatic Number Plate Recognition (ANPR) camera deployment
  - Queue length or delay surveys
  - Roadside Interview surveys (RSIs)
  - Journey time surveys by moving observer method, ANPR or Bluetooth detection
  - Public Transport surveys including rail and bus interview surveys and cordon surveys
- 5.3.4 Data collected by the suppliers above is processed, checked and cleaned as required. It is also quality assured before being prepared in a suitable format for use by Transport Scotland project teams directly or by consultants working on their behalf.
- 5.3.5 Data collected by LATIS consultants is generally available on request through the LATIS application process.

## **5.4 Data quality**

- 5.4.1 The quality of data used by the LATIS service is key to the credibility and value of the LATIS models and the outputs derived from them.
- 5.4.2 LATIS data suppliers are required to demonstrate the quality of data using a number of key performance indicators.
- 5.4.3 Prior to purchasing and using data collected by other methods, Transport Scotland works hard to understand the provenance and ensure that the quality of data is sufficient for each respective application, whether to LATIS models or in business case development. Two recent examples of this has been the collation of demographic data from National Registers Scotland in advance of the release of Census 2011 data for input to the land use model (TELMoS) and, secondly, the evaluation and scrutiny of data supplied by consultees regarding current and potential future employment impacts of the A9 dualling project.
- 5.4.4 One of the key benefits of the framework contract approach adopted by the LATIS Commission is the incentive to innovate and develop products which better meet the needs of Transport Scotland and improve data quality or the reliability of data capture methods. For example, one of the LATIS data suppliers has developed handheld scanner technology to improve the efficiency and accuracy of concessionary travel scheme card data capture. The scanners enable enumerators out in the field to scan and capture the 16 digit card number and associated information rapidly and the circumstances of concessionary passenger travel, thereby boosting sample rate and reducing capture, input and transcription errors significantly.

## **5.5 Data storage**

- 5.5.1 The LATIS Commission requires data suppliers to store and back up data securely for an extended period. However, in the short-term, to facilitate the use and application of data, suppliers use the LATIS online data sharing system to share survey results and data with other LATIS modelling consultants quickly and reliably.
- 5.5.2 Transport Scotland stores data in a number of ways. Observed data captured by Traffic Scotland is stored within the National Traffic Database System (NTDS) – the successor to the Scottish Road Traffic Database (SRTDb). Observed data from survey is collated internally and supplied on portable hard disk for storage.
- 5.5.3 Following the Appraisal and Modelling User Group workshop discussions on data, Transport Scotland are currently considering long term storage options for data collected for and output by the LATIS Commission. Any options must also facilitate discovery and access to data to a range of users internal and external.

## **5.6 Discovery, dissemination and use**

- 5.6.1 Observed data is generally made available on request through submission of a LATIS request form. Each applicant is requested to provide a project title, description of how the LATIS service will be utilised, the ultimate client and whether or not any training will be required. In addition, each applicant is asked how their project would have been undertaken had the LATIS service not been available.
- 5.6.2 Feedback was sought and it was found that users were very satisfied with the use of LATIS and its services for their purposes, the application process was easy to follow and the information requested from LATIS provided in a format that was easy to understand. In many cases, users stated that should the LATIS service not have been available then they would not have been able to undertake their task immediately. In such cases, users reported that further traffic surveys would have been commissioned and/or models developed to achieve the requirements of their study.
- 5.6.3 Further feedback from users suggested that they would use the LATIS service again in the future. User feedback did not provide any suggestions for further enhancing the existing LATIS suite of models or for improving the wider LATIS service.
- 5.6.4 The feedback provided by users suggested that the use of the LATIS service has provided money and time savings to users where otherwise further work would have been required to obtain similar information. Where traffic surveys would have been commissioned or further models developed this would have added a significant financial expense to a study in terms of time and development. In addition, the LATIS service provides a central location for information for a range of interested parties and promotes user engagement and technical excellence through the development of the LATIS models by effective project management and ongoing interaction between transport planners and land-use, planning and development specialists. LATIS delivers value for money to Transport Scotland and offers a range of benefits to model users including consistent, best practice, of-the-shelf modelling and appraisal tools, readily accessible data and a data collection facility and project advisory services.
- 5.6.5 A full record of data collected by LATIS data suppliers in 2012, 2013 and 2014 is presented in Appendix C.

## **5.7 Purchased Data**

- 5.7.1 Data is also purchased to support the LATIS modelling and appraisal work. Transport Scotland has purchased journey time data to support model development (journey time validation) and to supplement evidence for problems and issues on the road network from the following suppliers:
- 5.7.2 MapMechanics (INRIX) in 2012 for TMfS12
- 5.7.3 TomTom in 2014 for SRM 2014 update
- 5.7.4 As with any data from a commercial source, there are restrictions imposed by the licensor on Transport Scotland regarding its use and/or dissemination, therefore it is not generally available on request to external organisations or practitioners for alternative uses.

## **6 STRATEGIC DIRECTION**

### **6.1 Introduction**

6.1.1 LATIS provides a range of benefits to model users over each commission period. LATIS provides users with consistent, best practice, off the shelf modelling and appraisal tools, readily accessible data and a data collection facility and project advisory services.

### **6.2 The Value of LATIS**

6.2.1 The Annual Report 2011, as in 2010, recognised the value of the LATIS service to Transport Scotland in terms of economics, efficiency and effectiveness. This was supported by a quantitative assessment which evaluated the opportunity costs of LATIS by comparing the on-the-shelf LATIS modelling capability with an alternative modelling strategy in which models were developed for each “application”.

6.2.2 This quantitative assessment has not been repeated within this Commission Report. Nonetheless, Transport Scotland considers that the LATIS service offers the following qualitative benefits to themselves and the wider user group:

- Provision of consistent and credible evidence and policy advice
- Substantial project time savings as models and data are kept up to date, relevant and accessible through the Commission
- Scope for innovation and incorporation of best practice in modelling
- A forum for industry discussion and sharing of best practice
- Economies of scope across the service, meaning that, through targeted investment in our modelling capabilities and data, the service enables a wider range of needs to be met more cost effectively

### **6.3 Efficiency and Effectiveness / User Engagement**

6.3.1 LATIS offers Transport Scotland a range of benefits in terms of efficiency and effectiveness. The holistic approach of the LATIS service ensures that activities are coordinated, applied across a range of different projects, giving rise to economies of scale and scope.

6.3.2 LATIS offers time savings to Transport Scotland and other stakeholders in the application of transport models since the strategic models and data repository are available “off-the-shelf”. LATIS provides users with a robust tool that can be used quickly and cost-effectively, obviating either the need to wait for the development of a bespoke model or to proceed with a policy or project without a robust evidence base.

6.3.3 Crucially, Transport Scotland’s long-term commitment to LATIS encourages innovation and longer-term enhancements to be identified and incorporated in the model development process, which would not be possible if a series of short-lived, bespoke models had been developed instead.

6.3.4 The availability of LATIS ensures a certain level of consistency within Transport Scotland’s scheme and policy appraisals and other Government decision-making processes based on the model’s outputs. That is, it allows users to compare different scheme and policy interventions on a like-for-like basis. Regular use of a single model is also likely to be more efficient and less error-prone than the development and use of a number of ad hoc or bespoke models built in different software platforms with different constituent input data.

6.3.5 The wide range of applications which LATIS can support offers Transport Scotland economies of scope that would not be available within the narrow focus of a model designed for a single purpose or application.

6.3.6 The user engagement programme also supports efficiency by ensuring that enhancements are focused on meeting the needs of users and prospective users and by facilitating evaluation of the Commission more generally.

## **6.4 Realisation of Objectives**

- 6.4.1 With respect to the LATIS objectives set out at the beginning of the document Transport Scotland has achieved and met these well. LATIS user requests and model applications has been shown to increase each year indicating an ongoing need for the LATIS service.
- 6.4.2 In addition, and in the absence of the LATIS service, users indicate that a bespoke model would have been developed suggesting an economic saving to users with the service in place.
- 6.4.3 A further commission of the service would not only allow the user base to increase but provide a service that otherwise does not currently exist. The LATIS suite of models is constantly developing and moving forward and the service has been shown to progress with these. Users are not only familiar with the service but the absence of LATIS would mean additional costs and time to users to develop models separately, causing inefficiency through a lack of professional sharing of developed models.

## APPENDIX A

The objectives for the LATIS Commission for each contract or “Lot” and the progress made against each objective are detailed below.

### Objective Progress

The LATIS objectives under the TMfS Model Development commission stated:

#### ***Maintain and enhance existing TMfS models***

This has been achieved by maintaining legacy hardware and software capabilities for running the existing models. The forecasting capability of the existing TMfS07 was also extended to include additional forecast years of 2032 and 2037. This enhancement of the (then) existing model was available for on-going application while the current TMfS12 was being developed.

#### ***Identify potential improvements/enhancements to assist in developing robust policies***

Input into the development of TMfS and on-going advice related to long-distance modelling and the development of Transport and Land Use Primary and Alternative Forecast Scenarios (AFS) was undertaken during this commission.

Procedures were developed to use a single license to run multiple parallel versions of TMfS12 helping minimising run times. The range and flexibility of outputs available automatically from TMfS12 were significantly enhanced. Procedures were also developed during the AFS work to automate the production of outputs that would otherwise have required significant and time-consuming manual analysis to produce, such as vehicle emissions and sub-area vehicle kilometre summaries.

Further development expanded the range of forecast years available in TMfS up to 2037, where previously the limit was 2027. A range of scenarios were developed to supplement the primary TMfS12 scenario, examining a range of factors either individually or in combination, comprising population, economic growth, fuel price, and car ownership.

#### ***Align TMfS model outputs to national outcomes and indicators***

The range of automated outputs available from TMfS12 has been enhanced and tailored to the requirements of Transport Scotland. Various outputs can now be readily output for comparison with available regional/national statistics and indicators. These include national/regional outputs on trip making, travel times, travel distances, trip length distributions and congestion indicators.

TMfS12 was successfully developed for input into the A9 business case.

#### ***Contribute to Monitoring and Evaluation***

The TMfS12 and AFS development and reporting has assisted in meeting this objective. A greater understanding of the model's robustness, particularly in a local context has been gained by those applying the model and issues have been fed back and addressed for future versions.

Advice on the use of TMfS to ensure robust application, e.g. demand model convergence and the provision of on-the-shelf procedures to extract statistics, e.g. Select Link Analysis and Cordon procedures has also been undertaken.

Again, the enhanced outputs available ensure that TMfS12 and future versions are more transparent and flexible than preceding versions to facilitate evaluation of model performance and compare this against user end objectives.

#### ***Update TMfS to reflect changes in transport supply***

TMfS12 Base model was updated to include the relevant schemes that had been implemented since 2007, including the M74 & M80 road schemes and the Airdrie-Bathgate rail link.

TMfS12 was also refined to improve local representation within the Perth to Inverness and Inverness to Aberdeen corridors.

Additionally, the forecast year Do-Minimum networks were reviewed to ensure an appropriate future year baseline for forecasting and assessment.

***Recommend an approach for the development of second tier transport models.***

Transport Scotland has engaged directly with the relevant RTPs and local/regional authorities regarding 2nd tier modelling requirements.

Contributing to the development of the SESTRAN model was undertaken by feeding back concerns on the assignment during the application of the model on behalf of Fife Council. The issue was investigated by the model developer.

Discussions with NESTRANS, Aberdeen City and Aberdeenshire councils to discuss possible future modelling requirements in the region was also undertaken. This considered all aspects of the modelling hierarchy from national through regional to detailed local modelling.

TMfS12 was used as the donor model used as a starting point for the development of CSTM12.

Transport Scotland and SPT are working together on the development of a regional model covering the Strathclyde Area of Scotland.

***Provide advice on the application of new data sources/technology to improve the performance and functionality of TMfS;***

The use of INRIX journey time data during the development of TMfS12 enabled the strengths and weaknesses of this data to be fully understood and recommendations made regarding its future usability.

Transport Scotland regularly hold data collection workshops with the model developers. This ensures all are kept abreast of the latest developments in data collection and provides a forum to discuss the application of these.

Gap analysis and specification of a range of surveys throughout the commission has been undertaken. In addition to those mentioned above, Transport Scotland has engaged with the TMfS Model Developer to advise on the most appropriate areas of the country in which to collect data and how to prioritise the data collection to strike the correct balance between aspirations and available budgets.

Transport Scotland has engaged with both the TMfS Model Developer, the Data Collection consultants and other framework participants as required. This has included discussions on survey requirements, survey specifications, accuracy of collected data, use of data and issues to consider for the future.

***Maintain the support documentation and the version control system***

The relevant documentation has been maintained in support of the model development and AFS work undertaken during the commission. In addition, the version control system has been well maintained and is significantly enhanced compared with previous commissions across the full range of LATIS models. Model documentation is available in the Library of Reports on the Transport Scotland website: <http://www.transportscotland.gov.uk/latis/documents-reports-and-guidance>

***Harness knowledge sharing within the United Kingdom, and with other organisations, to make the best use of resources with a view to making the tools in Scotland more efficient and effective; and where applicable using attained knowledge to improve our own capabilities***

TMfS Model Developers are constantly involved in knowledge sharing throughout the UK and worldwide. Presentations at various conferences (e.g. STAR, Modelling World) throughout the commission term were undertaken and knowledge sharing opportunities are reviewed at the monthly LATIS meetings.

Representatives from Transport Scotland and the FPs were regular attendees at the Transport Modellers Forum. Aside from these activities, all parties keep up to date through day to day activities such as reading technical press/IHT articles and attendance at relevant lectures/events that also contribute to CPD.

SIAS also holds a regular in-house lunchtime sessions which either feature its own staff or invited guests presenting on relevant transport planning/modelling topics to help expand the breadth of knowledge of staff such that clients can benefit from this shared knowledge.



Discussions with Citilabs on a peer review of TMfS was also undertaken to provide an independent insight into the model structure.

***Seek refinement and innovation to improve the visual representation of outputs***

Early commission discussions with Citilabs regarding the possible use of Cloud computing services which would help to assist in making model data and outputs more transparent and visible via the internet was undertaken, as was a trial using Google Earth KML files as a mechanism to share data easily across Framework Participants.

TMfS Model Developers continue to enhance their knowledge and understanding of GIS packages, in particular the freely available QGIS, which shows potential of making model networks and data more freely transferrable between organisations for analysis and display purposes (see Figure 3.1).

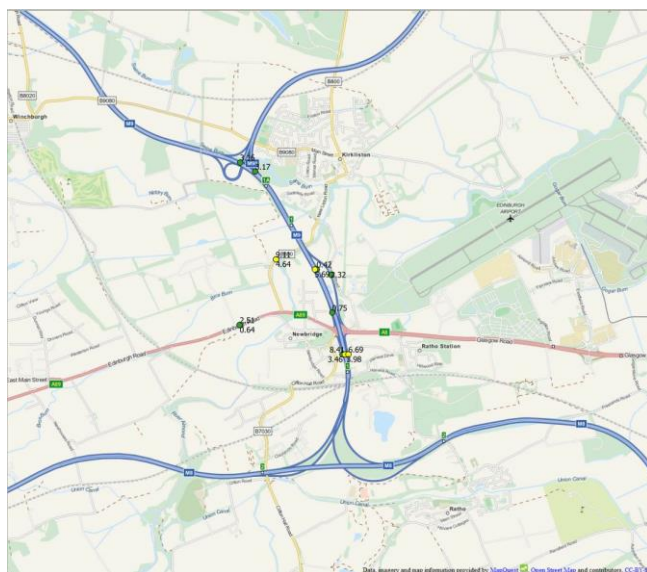


Figure 3.1: Example of QGIS output

***Provide consistency and improve interfaces with other models such as NMF, MOIRA to make the evaluation of Rail projects easier and more efficient and second tier models including the Central Scotland Motorway Model (CSMM)***

During all model development work, the implications for the wider model hierarchy have been considered, particularly with respect to the development of zoning systems. The TMfS12 zoning system was derived such that it could be readily interfaced with TMfS07 and further disaggregated for regional modelling (e.g. for CSTM12).

This ensured that TMfS12 would be able to readily interface with new models, such as CSTM12, but could retain backward compatibility with existing models, such as the SESTRAN model.

Historic inconsistencies in the passing of costs between TMfS and other processes (e.g. demand modelling and TELMoS interaction) during the TMfS12 development were identified, which are being addressed as part of TMfS14.

The ability to interface with models at any level of the hierarchy (e.g. CSMM, Kincardine microsimulation model and Forth William microsimulation model) has been maintained during this commission.

Transport Scotland through the LATIS commission is progressing the scoping of the next generation of the CSMM with Transport Scotland and is actively seeking the requirements of the model before recommending the most appropriate way forward.

***Present improvements and enhancements of model developments to appropriate groups***

TMfS Model Developers and partners have presented on various transport conferences regarding the work undertaken on this commission including:



- STAR (every year)
- Modelling world (2013 – TMfS benchmarking)
- ETC & TRB (2014 – Long-distance modelling – Peter Davidson)

TMfS Model Developers have also input to various papers presented at ETC by TS and others.

TMfS Model Developers contribute to the LATIS User Group and also provide input to a LATIS user discussion which was held for all framework participants.

***Provide a representative for the steering group and prepare an update statement to the steering group as requested***

TMfS Model Developers attended and presented to the Steering Group as requested in the first year of the commission. Since then, the Steering Group has been maintained as an internal Transport Scotland meeting without consultant attendance. TMfS Model Development consultants provide all requested input as required.

***Monthly progress meetings will be held and attendance will be dependent on Transport Scotland's requirements***

TMfS Model Developers have attended all monthly progress meetings and have hosted these on occasion. In addition, they maintain regularly weekly technical meetings with Transport Scotland staff to ensure progress is reported and risks are identified and mitigated as appropriate.

The TMfS Model Developer shared where necessary a project dashboard with Transport Scotland to assist in the detailed task/programme monitoring which is essential when working to tight timescales and with high risks.

***To develop and instigate a risk register process that reflects the multi consultancy nature of the frameworks, to ensure that those seeking TMfS outputs or using the models, clearly understand the appropriate degree of confidence to be applied.***

The TMfS Model Developers input to the risk register as appropriate, which can be accessed by Transport Scotland and all framework participants via the online data sharing system. In addition, the consultants maintain regularly weekly technical meetings with Transport Scotland staff to ensure progress is reported and risks are identified and mitigated as appropriate.

The TMfS Model Developers raise relevant risks at either LATIS monthly meetings, weekly progress meetings or as and when necessary.

***Advise Project Manager immediately of any risk to delivering a programme of work on time and budget***

The TMfS Model Developers have identified risks to programme at various occasions throughout this commission. In particular, during the development of TMfS12, they identified the challenges meeting the programme and sought to operate in the best interests of Transport Scotland when issues arose. While this resulted in a delay to the delivery date for the TMfS12 base model being identified, the revised delivery date was met.

In the case of TMfS14 development the TMfS Model Developers prepared and regularly updated the Scoping Note for this with the work programme clearly identified. Again, risks to delivery were identified and the TMfS Model Developers worked closely with Transport Scotland and DSC to finalise the specification and programme for TMfS14/TELMoS14. This included presenting various alternatives with a final specification and programme being agreed.

***Provide an annual report on potential enhancements and improvements to the LATIS commissions to ensure that it remains fit for purpose***

At the outset of the commission Transport Scotland progressed the preparation of the annual reporting and various contributions were received from the LATIS consultants which resulted in this report.

***Prior to the end of the commission, the Framework Participant shall produce an End of Term Report, outlining any outstanding issues and providing an outline work programme for the next period of the commission***

Transport Scotland will work with the LATIS consultants and gather contributions from the relevant parties to produce the End of Term Report which will inform the next LATIS commission.

The LATIS objectives under the Transport Economic and Land Use Model for Scotland commission stated:

***Maintain the existing TELMoS models and provide support to existing model users***

Throughout the period of the LATIS Lot 3 Commission the operational versions of the TELMoS model have been maintained. This has included:

- TELMoS07 – which was used in the original A9 and A96 work
- TELMoS12 – which has been used in the SESPLAN cross-boundary study

There has been no requests for application of TELMoS05a or earlier model versions. However these models have been maintained and could be run if requested.

***Identify potential improvements/enhancements to TELMoS to assist in the development of robust policies***

The TELMoS Inception Report identified a range of enhancements and improvements. These were reported in Section 3 of the Inception Report and included:

- Enhancements applied in DELTA applications elsewhere
- New functionality specific to TMfS' needs
- New functionality specific to wider stakeholder's needs
- New functionality specific to the interface to the transport model; and
- New Data sources

The Model Development Programme included further detail on those, amongst these enhancements, that Transport Scotland wished to take forward (at that point in time). These included:

- Redevelopment and intensification modelling
- Distinguishing dwelling types and tenures in development modelling
- Aligning household types and compositions with Census 2011 outputs
- Interface to other models (i.e. to CSTM12 and other models)
- A floorspace to dwelling conversion tool
- Extending TELMoS to forecast changes in Scottish economic and demographic growth (this will include the variable economic scenario separately requested in the brief)
- Applying external forecasts of international migration
- Better modelling of external links to/from Northern England
- Better modelling of external links to/from Scottish ports

***Use the land-use models within the LATIS service to support the appraisal of development planning and transport interventions to a brief specified by The Employer.***

Work undertaken relating to this objective includes:

- A9 and A96 Strategic Business Cases
- A9 Outline Business Case
- Support to Edinburgh to Glasgow High Speed Rail

- SESPLAN Cross Boundary Study

This work has included appraising schemes, advising on the application of wider economic benefits and wider impacts, advising on the application of the land use model and interpretation of results.

***Align TELMoS model outputs to national outcomes and indicators***

The Inception Report identified several enhancements that would strengthen the model's capability to inform Government outcomes and objectives. These were identified in Table 6 of that report.

Transport Scotland did not include any of these enhancements in the list of model developments that they wished developed further in the Model Development Programme.

***Meet the requirements set out in individual Task Order(s) with regard to the Monitoring and Evaluation of major transport projects***

There have been no task orders issued that relate to the monitoring and evaluation of major transport projects.

The TELMoS Model Developer operates an on-going process of model evaluation that draws upon experience both of the TELMoS and other applications of the DELTA forecasting package. This evaluation has fed into the proposals for TELMoS14.

***Update TELMoS to reflect the changes in the transport supply***

The transport supply associated with highway and rail improvements is modelled within TMfS. The TELMoS12 reference case and has been created using inputs from transport model runs that incorporate these new transport schemes within their representation of the transport network(s).

***Review the technical capabilities of the current version of TELMoS, including the software platform, in accordance with the instructions set out in individual Task Order(s)***

The Inception report identified a range of technical enhancements. The Model Development Programme further developed this range, in conjunction with Transport Scotland.

***Investigate the relationship between the methodologies behind TELMoS, Housing Needs and Demand Assessments, and Housing Supply Targets***

As part of the inception process, a meeting was held between DSC and members of the Housing Services and Regeneration Branch of the Scottish Government.

The inception report proposed a detailed design study looking at the potential of alignment of TELMoS and other Scottish Government Forecasts. This proposal was not taken up at that point of the Commission.

More recently the relationship of TELMoS and independent forecasts has been the subject of meetings both as part of the series of Regional Modellers Forum and in relation to TELMoS14.

***Provide advice on the application of new data sources/technology to improve the performance and functionality of TELMoS***

The TELMoS Model Developer has prepared notes upon:

- the use of 2011 Census commissioned tables
- the range of economic scenarios that are available and against which TELMoS might be calibrated
- a proposal to apply income data within the TELMoS/TMfS modelling
- the collection and use of Local Authority data to feed into TELMoS's modelling of planned development

The TELMoS Model Developer has also commented on:

- the potential for applying the parking data supplied by the Scottish Assessors

- techniques for land use and transport economic efficiency (LUTEE calculations)

The TELMoS Model Developer has participated in the quarterly data collection meetings hosted by Transport Scotland.

***Maintain the support documentation and the version control system***

TELMoS07 and TELMoS12 documentation has been maintained.

***Where appropriate, use best practice approaches and knowledge sharing from the rest of the United Kingdom, and with other organisations, to make the best use of resources with a view to making the tools in Scotland more efficient and effective***

The TELMoS Model Developer has continued to keep abreast of developments in land use modelling both in the UK and abroad, with a view to identifying best practice that may be appropriate to TELMoS and Transport Scotland.

Several of the technical enhancements identified in the inception report, and then taken forward in the Model Development Programme are examples of developments that have been applied in land use models elsewhere (for example international migration modelling, the application of variable economic and demographic scenarios, redevelopment and intensification modelling).

The TELMoS Model Developer has drawn upon expertise from within the Lot 3 team, including in relation to land modelling, income modelling and accessibility.

***Seek refinement and innovation to improve the visual representation of outputs***

The inception report identified ideas for developing the range and visual representation of outputs. These were not pursued by Transport Scotland.

***Present improvements and enhancements of model developments to appropriate groups***

TELMoS related papers presented to:

- STAR 2013
- STAR 2015
- AUM 2015
- ETC 2015

Throughout the course of the Commission the TELMoS Model Developer has presented papers to appropriate groups on developments and enhancements to land use modelling. For example:

- ETC 2012 paper on LUTTEE modelling
- TPM 2014 paper on application of a land use and transport model to prioritise infrastructure investment

***Provide training to any parties approved to use TELMoS***

The TELMoS Model Developer was the only team appointed to Lot 3. As such they are the only team approved to run TELMoS. There has been no requirement to train others as a consequence.

Training sessions that provide an overview of the land use model have been given to:

- Transport Scotland staff
- Consultants appointed to Lots 1 and 2

***Prepare a plan to promote TELMoS and LATIS out with the transport sector***

As part of the Inception process there was a round of consultation with:

- Scottish Government, Directorate of Local Government and Communities
- Scottish Government, Centre of Housing and Local Government
- Scottish Government, Housing Services and Regeneration

- Scottish Enterprise
- National Records of Scotland (formerly GROS)
- The Office of the Chief Economic Analyst
- Highland Regional Council

The Inception Report identified a number of initiatives to promote TELMoS out with the transport sector. These were not pursued by Transport Scotland when selecting those proposals of the Inception Report to take forward.

***Support Transport Scotland in its biennial ‘Assembly of Planning Policy Inputs’ (APPI)***

During the course of the Commission there have been two exercises to collect planning data. These were in 2012 and 2014.

***On award of a Task Order for a specific Scheme, in accordance with the Call-Off Procedure, the Services required of the Consultant shall include the following:***

- ***calibration and validation of the model following any amendments and on a scheduled basis to maintain credibility of the model usage;***
- ***updates to be issued to users appropriate means following major updates or amendments;***
- ***liaise with all consultants on the framework and the TMfS consultant to ensure that linkage between the land-use and transport models is maintained and improved as appropriate***

The key amendments made to the model during the Commission period have been the:

- Creation of a new TELMoS07 reference
- Creation of a new TELMoS12 version of the model
- Creation of a variant to the TELMoS 12 for use in the EGIP application
- Creation of several variants to the TELMoS12 with alternative scenarios (for the work on Alternative Forecast Scenarios)
- Creation of a variant to TELMoS12 with an interface to the SRM model (for the work on the SESPLAN Cross Boundary study)
- Scoping of a TELMoS14 model

In all instances the work has been undertaken in conjunction with the Lot 1 (or Lot 2) consultants. This has usually involved preliminary meetings and discussion, liaison during the model adjustment, and often joint reporting afterwards of model results and where appropriate calibration.

***Provide a representative for the steering group and prepare an update statement to the steering group as requested***

There has been one request to attend the steering group and one request to attend a regional modellers forum. In both cases the TELMoS Model Developer attended.

***Monthly progress meetings will be held and attendance will be dependent on Transport Scotland’s requirements***

Progress group meetings are held on a monthly basis. There has only been one meeting when there was no representative from the TELMoS Model Development team in attendance.

***To develop and instigate a risk register process that reflects the multi-consultancy nature of the frameworks***

A risk register for TELMoS07 and TELMoS12 have been implemented via the online data sharing system.

***Advise Project Manager immediately of any risk to delivering a programme of work on time and budget***

The Project Manager has been notified where budget overrun was expected on wider economic benefits and SESPLAN cross boundary study inputs.

***Provide an annual report on potential enhancements and improvements to the LATIS commissions to ensure that it remains fit for purpose.***

This Commission Progress Report has been prepared instead of annual reports.

***Prior to the end of the commission, the Framework Participant shall produce an End of Term Report, outlining any outstanding issues and providing an outline work programme for the next period of the commission***

This is currently being progressed.

## APPENDIX B

### Model Development Tasks

#### 2012 – 2013

The active Model Development Tasks for the Period May 2012 – May 2013 are shown as follows.

Year	Number	Description	Model	Model User	Ultimate Client
2012-2013	1	Prepare Scope for CSTM12 Develop Revised 2012-2032 Do	CSTM12	MVA Consultancy Ltd.	Transport Scotland
2012-2013	2	Minimum Scenarios. Produce LOT 1 Inception	TMfS07	SIAS Ltd	Transport Scotland
2012-2013	3	Report	All	All Lot 1 Framework Participents David Simmonds	Transport Scotland
2013-2014	4	Prepare Scope for TELMoS:12	TELMoS12	Consultancy	Transport Scotland

#### 2013 – 2014

The active Model Development Tasks for the Period May 2013 – May 2014 are shown as follows.

Year	Number	Description	Model	Model User	Ultimate Client
2013-2014	1	Prepare Scope for TMfS12	TMfS12	SIAS Ltd	Transport Scotland
2013-2014	2	Develop TMfS12	TMfS12	SIAS Ltd	Transport Scotland
2013-2014	3	Develop CSTM12 Develop A9 Microsimulation	CSTM12 A9 Corridor	MVA Ltd	Transport Scotland
2013-2014	4	Corridor Model Develop 2012-2037 Do	Model	SIAS Ltd	Transport Scotland
2013-2014	5	Minimum Scenarios. Develop 2012-2032 Do	TMfS12	SIAS Ltd	Transport Scotland
2013-2014	6	Minimum Scenarios. Develop 2012-2037 Do	CSTM12 A9 Corridor	SIAS Ltd	Transport Scotland
2013-2014	7	Minimum Scenarios. Prepare Scope for TMfS12	Model TMfS12	SIAS Ltd	Transport Scotland
2013-2014	8	Long-Distance Model	LDM	SIAS Ltd David Simmonds	Transport Scotland
2013-2014	9	Develop TELMoS12	TELMoS12	Consultancy	Transport Scotland

#### 2014 – 2015

The active Model Development Tasks for the Period May 2014 – December 2015 are shown as follows.

<b>Year</b>	<b>Number</b>	<b>Description</b>	<b>Model</b>	<b>Model User</b>	<b>Ultimate Client</b>
2014-2015	1	Prepare Scope for TMfS14	TMfS14	SIAS Ltd	Transport Scotland
2014-2015	2	Prepare Scope for TELMoS14 Prepare Scope for SEStran	TELMoS14	SIAS Ltd	Transport Scotland
2014-2015	3	Regional Model Update Update SEStran Regional	SEStran12	Systra Ltd	Transport Scotland
2014-2015	4	Model	SEStran12	Systra Ltd	Transport Scotland
2014-2015	5	Develop TMfS14 (with LDM) Prepare Scope of STEP	TMfS14	SIAS Ltd	Transport Scotland
2014-2015	6	Development	STEP	SIAS Ltd	Transport Scotland
2014-2015	7	Prepare Scope of TMfS12A	CSTM12A	SIAS Ltd David Simmonds	Transport Scotland
2014-2015	8	Develop TELMoS14 Prepare Scope for Update to Clyde Strategic Micro	TELMoS14	Consultancy	Transport Scotland
2014-2015	9	Simulation Model	CSMM	SIAS Ltd	Transport Scotland



## APPENDIX C

### Data Collection 2012

Data Type	Location	Project	Year
Roadside Interview	A9	RSI	2012
Roadside Interview	A95	RSI	2012

### Data Collection 2013

ID	Data Type	Location	Project	Year
22	Journey Times	Hamilton to Glasgow Airport (via M73)	SC1740 Commonwealth Games - Glasgow Journey Times	2013
23	Journey Times	Hamilton to Glasgow Airport (via M74)	SC1740 Commonwealth Games - Glasgow Journey Times	2013
24	Journey Times	Hillington to Newhouse	SC1740 Commonwealth Games - Glasgow Journey Times	2013
25	Journey Times	Newton Mearns to Hillington	SC1740 Commonwealth Games - Glasgow Journey Times	2013
26	Journey Times	M80 Robroyston to Haggs	M80 Journey Times (SC1790)	2013
27	Journey Times	Moodiesburn to Haggs	M80 Journey Times (SC1790)	2013
28	Journey Times	M80 Robroyston to Old Inns Roundabout	M80 Journey Times (SC1790)	2013
227	Journey Times	Roundabout	SC1760 Kincardine	2013
228	Journey Times	Roundabout	SC1760 Kincardine	2013
229	Journey Times	Gartary Roundabout	SC1760 Kincardine	2013

### Data Collection 2014

ID	Data Type	Location	Project	Year
1	Overtaking Surveys	A77 Haggstone Climbing Lane - Southern Site	Scottish Borders ANPR Surveys (SC1959)	2014
2	Overtaking Surveys	A77 Glen App - Southern Site	Scottish Borders ANPR Surveys (SC1959)	2014
3	Overtaking Surveys	A76 Glenairlie - Northern Site	Scottish Borders ANPR Surveys (SC1959)	2014
4	Overtaking Surveys	A7 Auchenrivock - Northern Site	Scottish Borders ANPR Surveys (SC1959)	2014
5	Overtaking Surveys	A75 Barfil to Bettyknowes - Eastern Site	Scottish Borders ANPR Surveys (SC1959)	2014
6	Overtaking Surveys	A75 Planting End to Drumflower - Eastern Site	Scottish Borders ANPR Surveys (SC1959)	2014
7	Overtaking Surveys	A75 Newton Stewart - Eastern Site	Scottish Borders ANPR Surveys (SC1959)	2014
8	Journey Times	A830 Arisaig	A830 Arisaig	2014
9	Journey Times	M74/M73	SC1924 M8/M73/M74 Journey Times	2014
10	Journey Times	A725	SC1924 M8/M73/M74 Journey Times	2014
11	Journey Times	M74/M73	SC1924 M8/M73/M74 Journey Times	2014
12	Journey Times	M8/M74	SC1924 M8/M73/M74 Journey Times	2014
13	Rail Passenger Surveys	Edinburgh to Glasgow Queen St	SC1904 Rail Survey	2014
14	Rail Passenger Surveys	Edinburgh to Glasgow Central via Bellshill	SC1904 Rail Survey	2014
15	Rail Passenger Surveys	Edinburgh to Glasgow Central via Motherwell	SC1904 Rail Survey	2014
16	Rail Passenger Surveys	Aidrie to Balloch	SC1904 Rail Survey	2014
17	Rail Passenger Surveys	Alloa to Glasgow Queen St	SC1904 Rail Survey	2014
18	Rail Passenger Surveys	Edinburgh to Helensburgh	SC1904 Rail Survey	2014
19	Journey Times	A9 - Dalwhinnie to Aviemore	SC1882 A9 & A96 Journey Times	2014
20	Journey Times	A96 - Fochabers	SC1882 A9 & A96 Journey Times	2014
21	Journey Times	A96 - Fochabers	SC1882 A9 & A96 Journey Times	2014
204	Journey Times		0 SC2040 - A96 Inverness to Nairn	2014
205	Journey Times		0 SC2040 - A96 Inverness to Nairn	2014
206	Journey Times		0 SC2040 - A96 Inverness to Nairn	2014
207	Journey Times		0 SC2040 - A96 Inverness to Nairn	2014
208	Journey Times		0 SC2040 - A96 Inverness to Nairn	2014
209	Journey Times		0 SC2040 - A96 Inverness to Nairn	2014
210	Journey Times	Cairnstop to Barlae	SC2058 - A75, Cairnstop to Barlae	2014
211	Journey Times	A720 Straiton - Old Craighall Junction	SC2041 - A720, Edinburgh	2014
212	Journey Times	Gilmerton Station Rd / Drum Street Circular	SC2041 - A720, Edinburgh	2014
213	Journey Times	Danderhall Circular	SC2041 - A720, Edinburgh	2014
214	Journey Times	Route 1	SC1822 A82 Tarbet	2014
215	Journey Times	Route 2 - Section 1	SC1822 A82 Tarbet	2014
216	Journey Times	Route 2 - Section 2	SC1822 A82 Tarbet	2014
217	Journey Times	Route 2 - Section 3	SC1822 A82 Tarbet	2014
218	Journey Times	Laurencekirk	Laurencekirk	2014
219	Journey Times	Laurencekirk	Laurencekirk	2014
220	Journey Times	Laurencekirk	Laurencekirk	2014
221	Journey Times	Laurencekirk	Laurencekirk	2014
222	Journey Times	Laurencekirk	Laurencekirk	2014
223	Journey Times	Laurencekirk	Laurencekirk	2014
224	Journey Times	Laurencekirk	Laurencekirk	2014
225	Journey Times	Laurencekirk	Laurencekirk	2014
226	Journey Times	Laurencekirk	Laurencekirk	2014
230	Journey Times	Manrahead Roundabout	SC2077 North Ayrshire JTs	2014

ID	Data Type	Location	Project	Year
10001	Junction Turning Counts	A82 / A83 (Tarbet)	A82 Tarbet to Inveranan	2014
10002	Junction Turning Counts	A82 / Bonnie Braes Restaurant Access	A82 Tarbet to Inveranan	2014
10003	Junction Turning Counts	A82 / Loch Lomond Holiday Park Access	A82 Tarbet to Inveranan	2014
10004	Junction Turning Counts	A82 / Inveruglas Visitor Centre (South)	A82 Tarbet to Inveranan	2014
10005	Junction Turning Counts	A82 / Inveruglas Visitor Centre (North)	A82 Tarbet to Inveranan	2014
10006	Junction Turning Counts	A82 / Ardlui Hotel Car Park Access	A82 Tarbet to Inveranan	2014
10007	Junction Turning Counts	A82 / Ardlui Hotel Holiday Park Access	A82 Tarbet to Inveranan	2014
10008	Junction Turning Counts	A82 / Loch Lomond Outdoor Centre Access	A82 Tarbet to Inveranan	2014
		A82 / Drovers Inn Access / Drovers Lodge		
10009	Junction Turning Counts	Access	A82 Tarbet to Inveranan	2014
10010	Junction Turning Counts	A82 / Beinglas Farm Campsite Access	A82 Tarbet to Inveranan	2014
10011	Overtaking Surveys	A77 Haggstone Climbing Lane - Southern Site	Scottish Borders ANPR Surveys (SC1959)	2014
		A77 Haggstone Climbing Lane - Southern		
10012	Overtaking Surveys	Middle Site	Scottish Borders ANPR Surveys (SC1959)	2014
		A77 Haggstone Climbing Lane - Northern		
10013	Overtaking Surveys	Middle Site	Scottish Borders ANPR Surveys (SC1959)	2014
10014	Overtaking Surveys	A77 Haggstone Climbing Lane - Northern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10015	Overtaking Surveys	A77 Glen App - Southern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10016	Overtaking Surveys	A77 Glen App - Middle Site	Scottish Borders ANPR Surveys (SC1959)	2014
10017	Overtaking Surveys	A77 Glen App - Northern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10018	Overtaking Surveys	A76 Glenairlie - Northern Site	Scottish Borders ANPR Surveys (SC1959)	2014
		A76 Glenairlie - Southern Site (NORTHBOUND CAMERA)		
10019	Overtaking Surveys	A7 Auchenrivock - Northern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10020	Overtaking Surveys	A7 Auchenrivock - Southern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10021	Overtaking Surveys	A75 Barfil to Bettyknowes - Eastern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10022	Overtaking Surveys	A75 Barfil to Bettyknowes - Western Site	Scottish Borders ANPR Surveys (SC1959)	2014
10023	Overtaking Surveys	A75 Barfil to Bettyknowes - Western Site	Scottish Borders ANPR Surveys (SC1959)	2014
10024	Overtaking Surveys	A75 Planting End to Drumflower - Eastern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10025	Overtaking Surveys	A75 Planting End to Drumflower - Western Site	Scottish Borders ANPR Surveys (SC1959)	2014
10026	Overtaking Surveys	A75 Newton Stewart - Eastern Site	Scottish Borders ANPR Surveys (SC1959)	2014
10027	Overtaking Surveys	A75 Newton Stewart - Western Site	Scottish Borders ANPR Surveys (SC1959)	2014
10028	Journey Times	A830 Arisaig	A830 Arisaig	2014
10029	Journey Times	A830 Arisaig	A830 Arisaig	2014
10030	Automatic Traffic Counts	B9077	SC1902 Scotland Link Surveys - Aberdeen Area	2014
10031	Automatic Traffic Counts	A93	SC1902 Scotland Link Surveys - Aberdeen Area	2014
10032	Automatic Traffic Counts	A944	SC1902 Scotland Link Surveys - Aberdeen Area	2014
10033	Automatic Traffic Counts	A947	SC1902 Scotland Link Surveys - Aberdeen Area	2014
10034	Automatic Traffic Counts	B997	SC1902 Scotland Link Surveys - Aberdeen Area	2014
10035	Automatic Traffic Counts	B999	SC1902 Scotland Link Surveys - Aberdeen Area	2014
10036	Automatic Traffic Counts	A862	SC1902 Scotland Link Surveys - Inverness Area	2014
10037	Automatic Traffic Counts	A941	SC1902 Scotland Link Surveys - Highland Area	2014
10038	Automatic Traffic Counts	A941	SC1902 Scotland Link Surveys - Highland Area	2014
10039	Automatic Traffic Counts	A85	SC1902 Scotland Link Surveys - Tayside Area	2014
10040	Automatic Traffic Counts	A701	SC1902 Scotland Link Surveys - Edinburgh Area	2014
10041	Automatic Traffic Counts	B702	SC1902 Scotland Link Surveys - Edinburgh Area	2014
10042	Automatic Traffic Counts	A7	SC1902 Scotland Link Surveys - Edinburgh Area	2014
10043	Automatic Traffic Counts	B6392 Gilmerton Road	SC1902 Scotland Link Surveys - Edinburgh Area	2014
10044	Automatic Traffic Counts	A6124	SC1902 Scotland Link Surveys - Edinburgh Area	2014
10045	Automatic Traffic Counts	B701 Frogston Road	SC1902 Scotland Link Surveys - Edinburgh Area	2014

<b>Location</b>	<b>Project</b>	<b>Year</b>
B9077 (West of A90), Aberdeen	Scotland Link Surveys - Aberdeen Area	2014
A862 (At Muir of Ord)	Scotland Link Surveys - Inverness Area	2014
A941 (North of Elgin)	Scotland Link Surveys - Highland Area	2014
A85 (West of A9 Perth)	Scotland Link Surveys - Tayside Area	2014
A701 (South of A720 at Straton)	Scotland Link Surveys - Edinburgh Area	2014
B816 (West of M80)	Scotland Link Surveys - Forth Area	2014
Various	Scotland Link Surveys - Glasgow Area	2014
A811 Stirling Road (West of Drymen)	Scotland Link Surveys - Strathclyde Area	2014
A71 (at Polbeth)	Scotland Link Surveys - Borders Area	2014
A71 (West of B7064)	Scotland Link Surveys - Borders Area	2014
Dundee Area	Scotland Link Surveys - Dundee Area	2014
A720, Edinburgh	Transport Scotland	2014
A82	Scotland RSI	2014
A9	Scotland RSI	2014
Granton-on-Spey Roundabout	Scotland RSI	2014
A96	Scotland RSI	2014
Edinburgh	Scotland Bus Passenger Surveys	2014
Glasgow	Glasgow Bus Cordon	2014
Edinburgh	Glasgow Bus Cordon	2014
Stirling	Glasgow Bus Cordon	2014
Aberdeen	Glasgow Bus Cordon	2014
Perth	Glasgow Bus Cordon	2014
Dundee	Glasgow Bus Cordon	2014
Inverness	Glasgow Bus Cordon	2014
Edinburgh/Glasgow Central	Transport Scotland	2014
Edinburgh/Glasgow Q St	Transport Scotland	2014
A95 Inverallan		2014
A82 Crianlarich		2014
A9 Tomatin		2014
Aberdeen Area	Transport Scotland	2014
Inverness Area	Transport Scotland	2014
Highland Area	Transport Scotland	2014
Tayside Area	Transport Scotland	2014
Edinburgh Area	Transport Scotland	2014
Forth Area	Transport Scotland	2014
Glasgow Area	Transport Scotland	2014
Strathclyde Area	Transport Scotland	2014
Borders Area	Transport Scotland	2014
South-West Area	Transport Scotland	2014
VArious	Transport Scotland	2014