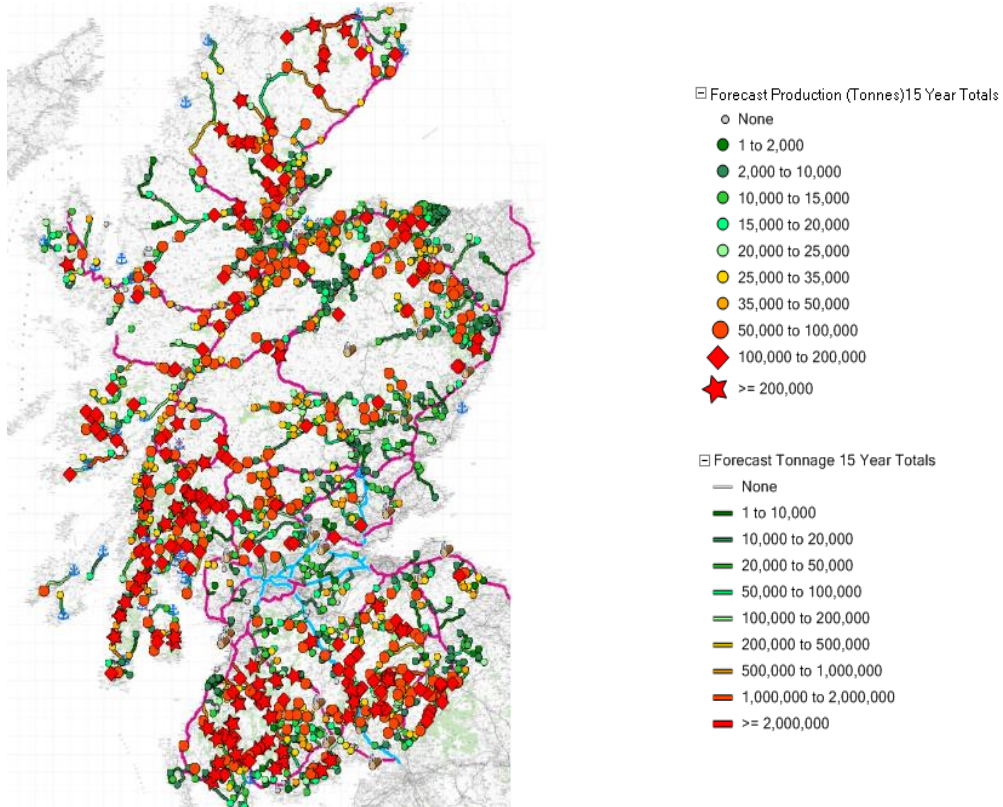


# Timber Transport Planning Tool



## TimberTransportForum

delivering solutions for a growing UK harvest

## **1. Timber Transport in Scotland**

Scotland's forest and timber industries employ around 40,000 people and are worth in excess of £1.6bn to the Scottish economy. Hauling timber is an essential part of the process of sustainable forest management which delivers major economic, social and environmental benefits, including employment, climate change mitigation, improved biodiversity, renewable fuel, enhanced air quality, flood mitigation, recreation and public health opportunities. About 7 million tonnes of timber are currently transported on the public road network each year and this is expected to rise to 10mt/yr. by 2030.

The increased timber volume is good news for the timber industry which has invested significantly in modern processing facilities to process and add value to the resource. The timber industries are low carbon, rural, value adding, manufacturing, import substituting, well paid skilled jobs.

But many forests are constrained by the road access. Most forests are served by minor rural roads maintained by councils as local road authorities. The rural road network is based on previous land uses connecting rural communities and agricultural businesses and concentrated timber lorry traffic can impact on rural roads causing damage and disruption for these rural communities

The Timber Transport Forum was set up in 2000 as a partnership between the forestry and timber industries and the local roads authorities. The Forum works through 7 regional timber transport groups in Scotland – partnerships at local level. The Forum produces guidance and advice, enabling sustainable use of the existing local road infrastructure. The regional groups produce Agreed Routes Maps which highlight potential constraints on roads leading to forests and organise liaison between council roads authorities and the timber industry to address these constraints.

The Forum also works with Forestry Commission Scotland to allocate funding from the Scottish Government's Strategic Timber Transport Fund. This Fund has been used to match local authority or private funding in order to reduce the impacts of timber transport through relatively small scale investment in public roads or in forest roads or other modes of transport which take traffic off weak roads.

## **2. The Timber Transport Planning Tool**

In some parts of the country, the Forum had previously collected data on where timber was forecast to leave forests and come onto the public road network. This was found to be useful to local roads authorities in planning maintenance and investment and in looking strategically at timber traffic management in their particular region.

In 2014 the Forum (through Argyll & Bute Council) received a grant from the Scottish Roads Research Board to formalise the data collection process, extend it across the forested parts of Scotland and develop a tool to present the data visually.

## **3. Data Collection**

The data to be collected was standardised with the data form (see Appendix 1) asking for the exact grid references of exit points from forests onto the public road, together with the forecast tonnages of timber expected over the next three 5 year periods (from 2015-2029).

A contract was let to RDI Associates Ltd. (RDIA) for the data collection phase of the project; RDIA then worked with local consultants who sent maps and data forms to all known forest owners. In some cases, Forestry Commission Scotland assisted by mailing their database of forest owners. Where there were gaps in data, the local consultants used their knowledge to track down owners or agents or, assumed exit points and estimated likely tonnages from areas of forest.

A summary of the data collected is given in Appendix 2.

The original data is held by Confor on behalf of the Timber Transport Forum and includes agent or owner details which would allow for a refresh of the data after 5 years.

Data from the Forestry Commission's Forest Inventory on [woodland area and potential harvestable volume](#) was also made available at local authority level allowing a degree of comparison with the high level figures from the data collection survey.

#### **4. Data Presentation**

The project also included a budget for presenting the data on a GIS map. The Forum had in mind a tool that could show the transport flows resulting from the timber coming from the forest exit points. This would enable roads authorities to look at the cumulative impact of several forests exiting onto roads and highlight where forecast traffic would challenge local road capacity for HGVs.

The SRRB helped facilitate development of the tool via Transport Scotland's Transport Research Multiple Framework Agreement. Research specialist TRL was retained to provide assistance to the Forum. Forum representatives had several meetings with TRL to focus in on what we wanted the tool to deliver and TRL then finalised the brief and through an iterative process developed the GIS tool using the exit point data collected and other available datasets (e.g. road networks and processor destinations).

#### **5. The Timber Transport Planning Tool**

The Timber Transport Planning Tool calculates traffic loads resulting from planned timber harvesting in Scotland and allows users to examine and adjust the forecast traffic loads on Scottish local roads based on changes to production activities.

This tool takes as inputs:

- The collected forecast data
- Locations of timber site exit points (where timber traffic joins the public road network)
- Any ports and/or processing plants which act as local destinations for timber traffic
- The Agreed Routes Map (ARM) – a set of recommended and/or banned routes for timber traffic agreed between Regional Timber Transport Groups and the local authorities.
- The Ordnance Survey ITN (Integrated Transport Network) mapping layer

The tool then calculates 'expected' routes from each timber site to either a local destination (port or processing plant) or the Trunk Road Network (whichever is closest). These routes are calculated based on weighted road characteristics (such as local road, A road etc. - defined in the OS data) and any relevant ARM routes; an A road, for example, is strongly preferred over a local road and thus sensible routes are derived.

These calculated routes are combined with the forecast data to produce maps showing the expected timber traffic load on local authority roads over the next 3 quinquennia or 15 year cumulative total.

The tool can be used to zoom in on individual areas and/or production from individual sites. It is also possible to adjust the forecast production from timber sites and see the effect this may have on the timber traffic load in the coming years.

A technical [user guide](#) to the tool can be found on the Timber Transport Forum website. Details of the software used can be found in Appendix 3.

#### **6. Sharing, dissemination and feedback**

The Timber Transport Planning Tool was completed in March 2015 and presented to the Timber Transport Forum meeting in April 2015. The PowerPoint presentation can be found [here](#).

The tool (including the data) comes in a 350MB zip file on a CDROM or memory stick and can be downloaded onto any windows computer. The Timber Transport Forum project officer holds the Master Copy and a list of those with a copy of the tool is being kept.

Each regional timber transport group project officer has a copy of the tool on a laptop and over the summer of 2015, the tool has been demonstrated at several regional timber transport group meetings.

Timber Transport Groups are responsible for deciding with whom the tool should be shared. In some cases it is being shared with local authority roads and planning departments. In others, the tool will remain with the timber transport group project officer but they will engage with others as required to provide strategic information as required.

The Timber Transport Forum project officer has described the tool to: -

- the Scottish Roads Review Stakeholders group;
- a business meeting of SCOTS in August 2015;
- a meeting of SG staff relating to Land Use and infrastructure planning in September 2015;
- the COSLA Development, Economy and Sustainability Committee in September 2015;
- a Forum meeting with Dr Aileen Macleod MP Minister for Environment Climate Change and Land Reform.

The tool will also be demonstrated at the Timber Transport Forum National Conference at Battleby on 10<sup>th</sup> March 2016.

### **6.1. Highland Timber Transport Group**

The tool was presented and explained to the Highland TTG meeting in June. In the Highlands it will be used very much as a strategic tool and it is not intended to distribute it widely to Council staff at present but to develop its use jointly with the Group project officer.

The data collected under this project supplements and updates previous data collected by the Highland Group and, for the first time, this tool gives the ability to realistically model local and regional timber traffic movements. For example the "attractiveness" of destination ports, mills etc. varies from time to time depending on market conditions and the tool will be useful in testing multiple scenarios of this nature.

Frontline council staff are always under pressure to respond to timber routeing and access queries and a key role of the Highland TTG is to develop joint strategy in the form of reviewing and updating the Agreed Routes Maps. In the coming months work will focus on refining the 2014 data and eliminating inappropriate routeing as well as confirming the key timber routes and pinch points. In turn this will be extremely useful and important in underpinning any future applications to the Strategic Timber Transport Fund with evidence of robust data and analysis.

### **6.2. Argyll Timber Transport Group**

The tool is being used by the Argyll TTG project officer who is using the data to assist others in strategic planning. The exit point tool has also been used to assist with queries relating to timber haulage and providing data for STTF project applications. Argyll & Bute Roads Department technical officers and staff have recently had a training and information sharing session with the Argyll TTG project officer where the exit point tool was demonstrated and potential uses identified.

Illustrations from the exit point tool have been used to graphically demonstrate timber volumes and exit points in a paper 'Argyll Timber Flows 2015'. This is a summary of ATTG activity to date for wide circulation and promotion of the Group.

In addition, the exit point data collected for Argyll has led directly to another STTS-supported strategic project looking at opportunity mapping to share access between the Argyll Forest & Energy Sectors. This partnership pilot project (Argyll Timber Transport Group (ATTG), Scottish and Southern Energy (SSE), Forestry Commission Scotland (FCS) and Argyll & Bute Renewable Alliance (ABRA)) brings the forest and energy sectors together to identify and map opportunities for collaboration and possible pinch points or future issues relating to rural heavy transport both on the public road network and in-forest haul routes.

These Opportunity Exit Points represent potential areas of future focus to identify solutions to divert traffic to these exit points and away from more constrained areas.

### **6.3. South of Scotland Timber Transport Groups**

The tool has been demonstrated to the Scottish Borders Timber Transport Group and key staff within Dumfries and Galloway Council. The councils have struggled to persuade IT departments to install the software and so it has had a limited use by the Roads staff to date. We have provided them with the software specifications and other details but it is yet to get resolved. They are however keen to obtain the data and use this as part of road planning and the wider Asset Management. Area specific maps of all the data for the 15 years have been given to Council road engineers to give an early warning for timber harvesting operations. Private sector partners would like the tool and the data within it but at present it is only being shared with the Councils; the exit point data for south Scotland is being shared more widely. There is scope to integrate some of the information into the ARM Web GIS.

### **6.4. Grampian and Stirling & Tayside Timber Transport Groups**

The tool was presented to Stirling & Tayside TTG and Grampian TTG meetings in July 2015 in order to show the software and summarising how data could be used. The project officer was asked to visit the Local Authorities road staff to demonstrate the programme in more detail and provide copies of the software and User Guide. In September it was shared with Angus Council roads services (software installed on one PC), Aberdeenshire Council roads services and planning service and Moray Councils roads service (software provided but wasn't able to be installed on PC or laptops due to IT restrictions). Further information is being shared with Local Authority IT services which should enable them to install the software. Meetings are currently being arranged with roads services of Clackmannanshire, Perth & Kinross, Stirling and West Dunbartonshire Councils in order to provide and demonstrate software. The tool will be presented to the TACTRAN meeting in November 2015.

The tool has been used to review the mapped exit point coverage (Phase I and Phase II) to highlight any non-returns to original data collection survey. The exit point data layer has been added to Agreed Routes Maps (ARM) layer to highlight roads on which timber transport is anticipated but which don't currently carry a specific ARM classification. This map has been circulated in preparation for a review of ARM classification discussion at the next RTTG meetings in November 2015.

## **7. Corrections**

Inevitably, as people use the tool, errors are being picked up, either in the GIS referencing of exit points or processing plants, or in the route calculated to the trunk road. Corrections can be made on the individual programme running on a particular computer and stored as 'scenarios'. A list of regional corrections is being kept by each Regional Timber Transport Group project officer and an overall list by the Timber Transport Forum project officer.

Where changes are required (e.g. adding new exit points/removing exit points/changing road scores etc.), these would be discussed and agreed by the regional timber transport group and submitted to the Timber Transport Forum project officer. The Master Copy would then be updated periodically to incorporate any changes and new versions of the tool re distributed to the list of users. The first update will be done in April 2016.

## **8. Updating**

The geographic location of the forest resource and the road network is stable on a fifteen year timescale. Exit points will change gradually with new exit points being developed. A refresh of the data collection exercise will be considered in 2020.

## **9. Conclusions**

Collecting the data in itself highlighted to the industry the importance of timber transport management. Processing the data and the development of the tool has also generated information and ideas leading to a spinoff project on sharing infrastructure with the energy sector. The tool is changing the way the Regional Timber Transport Groups and Timber Transport Forum work and plan strategically. The data is particularly useful in refining Agreed Routes Maps and helps justify applications to the Strategic Timber Transport Fund. Where the information has been shared with Councils the response has been very positive and the potential to use the data recognised. There are some hurdles to overcome in terms of IT security protocols but we will get there. While not all the groups are sharing the actual Timber Transport Planning Tool, the groups do have good relationships with council staff and the group project officers are helping to feed the information into regional strategies as and when required.

The tool is a communication tool as much as an analytical tool and it is improving the Forum's ability to engage at a strategic level with other stakeholders.

Roland Stiven, Timber Transport Forum, 27<sup>th</sup> October 2015 [roland.stiven@confor.org.uk](mailto:roland.stiven@confor.org.uk)

# SCOTLAND TIMBER TRAFFIC SURVEY Timber Outputs & Access Survey 2014 (Region here)



### Part 1 – Contact Details

Name:.....Estate (if applicable).....

Company / Organisation .....

Are you the Owner or Managing Agent?      Owner       Agent

Address .....

..... Postcode .....

Telephone ..... E-Mail .....

### Part 2 – Survey Map

On the map provided:

- Please indicate as clearly as possible those woodland(s) that you own and /or manage.
- If you own or manage more than one woodland please number them so as to cross reference with the timber output data you provide in Part 3 below.
- If you own and/or manage a number of separate woodlands as a single management unit or as part of a whole estate, these may be encircled and treated as one if appropriate (e.g. using a common exit point).

### Part 3 – Timber Outputs & Access Data Sheet (overleaf)

- Please enter the production forecasts in the three quinquennia (columns 7, 9 and 10).
- Please indicate in Column 3 which, if any, of the woodlands are covered by an approved Forest Plan.

### Part 4 – Survey Return Checklist

When returning Parts 1, 2 and 3 of the Survey (in the stamped addressed envelope provided), please check that you have:

- Entered your contact details in Part 1 above .....
- Enclosed the Map provided, indicating the outline(s) of the woodland(s) you own and/or manage and relevant timber movement exit point(s).....
- Populated the Timber Outputs & Access Data Sheet overleaf and cross referenced it to the Map as appropriate .....

### Further Assistance

I / We would like to be contacted for further assistance in completing the Survey .....

Signed: ..... Date: .....

## Appendix 2. FOREST OUTPUT AND ACCESS DATA COLLECTION REPORT

### INTRODUCTION

Argyll and Bute Council, in conjunction with the Argyll, Ayrshire, Scottish Borders, Dumfries & Galloway, Grampian, Highland and Stirling & Tayside Timber Transport Groups, applied to the SCOTS SCOTTISH ROADS RESEARCH BOARD (SRRB) for assistance towards a project aimed at researching and testing a consistent methodology and robust system for gathering, storing and updating a range of timber haulage-related information on a national level. Argyll and Bute Council subsequently commissioned Phase I of the work (forest output and access data collection) to a consortium known as the Scottish Timber Transport Survey Syndicate (STTSS), whose members are indicated below. A second phase of the project – the development of thematic maps and a dynamic planning tool – was to be undertaken by TRL under contract to Transport Scotland.

Consortium Member	Regional Timber Transport Group allocation
RDI Associates Ltd (lead member)	Dumfries & Galloway/Ayrshire/Scottish Borders
GR Forestry Consultancy	Grampian, Stirling and Tayside
CJ Piper & Co. Chartered Forester	Highland
Mark B Page, Chartered Forester	Dumfries & Galloway/Ayrshire/Scottish Borders
Scotwood MacDonald	Argyll

Day-to-day liaison was managed through RDI Associates Ltd, with monthly reports submitted to Roland Stiven, Timber Transport Forum Project Officer and Kirsty Robb, Argyll Timber Transport Group Project Officer for wider circulation amongst a Project Working Group.

The data collection process followed previous exercises in Grampian, Highland and Stirling & Tayside Timber Transport Groups and an example of the data sheets used is included in **Appendix 2**. In addition to hard copy (or electronic) survey forms for recording forecast timber production over 3 quinquennia (2015-19, 2020-24 and 2025-29), A1 maps were disseminated so that respondents could highlight the areas of woodland under their management.

### PROJECT TIMESCALES (PHASE I)

- 5 March 2014 – Pre commencement meeting held
- w/c 8 May 2014 – Survey packs issued to majority of identified respondents
- 6 June 2014 – submission of test data from GTTG area for review/comment by TRL
- 9 June 2014 – initial survey return deadline
- 31 July 2014 – extended survey return deadline
- 5 September 2014 – Submission of survey data to Project Working Group deadline

### SUMMARY OF RESULTS

Survey data was allocated to the relevant Local Authority area which then allowed information to be recorded against the appropriate Regional Timber Transport Group. Information on woodland cover (Ha) by Local Authority was used as a means of assessing the level of responses received through survey returns.





## Woodland Cover by Local Authority

Regional Timber Transport Group	Area of woodland (Ha) by Local Authority	Woodland cover (Ha) in STTS returns	% LA woodland cover included in STTS returns
Argyll	204,762	193,030	94
Ayrshire	108,059	75,378	70
Borders	94,094	65,709	70
Dumfries & Galloway	177,209	153,458	87
Grampian	175,784	116,051	66
Highland	404,950	290,154	72
Stirling & Tayside	174,145	125,590	72
None	71,658	17,823	25
<b>Totals</b>	<b>1,410,661</b>	<b>1,037,193</b>	<b>74</b>

## Exit points onto the public road network

Regional Timber Transport Group	Number of exit points identified
Argyll	331
Ayrshire	77
Borders	160
Dumfries & Galloway	298
Grampian	454
Highland	629
Stirling & Tayside	319
No group	105
<b>Totals</b>	<b>2,373</b>

## Timber Tonnages

Regional Timber Transport Group	Timber output 2015 - 19 (t)	Timber output 2020 - 24 (t)	Timber output 2025 - 29 (t)	Totals (t)
Argyll	7,113,091	7,183,468	6,488,664	20,785,223
Ayrshire	2,308,529	2,102,509	1,615,388	6,026,426
Borders	3,354,660	2,893,470	1,805,160	8,053,290
Dumfries & Galloway	6,304,259	5,901,350	5,250,925	17,456,534
Grampian	3,037,797	2,961,051	2,772,982	8,771,830
Highland	5,675,498	9,083,920	5,509,720	20,269,138
Stirling & Tayside	3,027,582	2,829,603	3,031,667	8,888,852

None	909,452	796,484	642,680	2,348,616
<b>Totals (t)</b>	<b>31,730,868</b>	<b>33,751,855</b>	<b>27,117,186</b>	<b>92,599.909</b>

### Conclusions

The critical issue of survey pack dissemination was highlighted and it was agreed that FCS would be contacted and asked for assistance in identifying survey respondents. Unfortunately however, due to data protection restrictions, FCS were limited as to what information they could provide with the result that an efficient means of obtaining the required information on woodland owner or their agents was more difficult to achieve.

It was also sometimes problematical to achieve returns from larger forest management companies who felt that a significant portion of time needed to be allocated to filling out the data sheets. Therefore considerable effort was expended in chasing expected returns and liaison about the completion of returns. Because of the comparatively late despatch of the data sheets, the holiday period over which the project was largely conducted and the need to chase returns which the syndicate knew would significantly affect results, the final submission of data was extended to 5<sup>th</sup> September 2014.



### **Appendix 3 Technical description of the software used in the Timber Transport Planning Tool.**

By Neal Harwood TRL

It is a Mixed Visual Basic and Visual C# program, with an associated Microsoft Access database and some ESRI shapefiles as base data.

It installs using the Microsoft Click-Once mechanism (which should reassure IT people).

The base program and data are installed by Click Once. The program, when run, creates a directory called TimberTransport in My Documents, and stores a few small user specific files there.

The DLLs it uses are all standard Microsoft ones, plus a set of DLLs from the open source DotSpatial library (compiled from source by me).

The MS dlls include Microsoft.Office.Interop.Access.Dao.dll, which is the Microsoft Office 15.0 Access database engine Object Library, used to interact with the database.

Details of DotSpatial (including its source code) may be found here:

<https://dotspatial.codeplex.com/>

All the data files are stored on the local machine, in a DATA directory chosen by the ClickOnce installation system. The exact path will vary by machine (click once adds 'random' numbers to the directory names).

The general form is

C:\Users\<>yourname>\AppData\Local\Apps\2.0\Data<xxx>\<yyy>\<zzz>\Data\DataFiles\

There are 4 subdirectories

#### 1. Background

This contain .TIF files which are 1:25000 scale tiles from the OS Open Data set. They have been edited to make them monochrome apart from forest areas so that the contrast with the foreground is maintained.

#### 2. Database

Contains the Access database

#### 3. Masks

Contains shape files defining the TTF regions (from James England)

#### 4. ShapeFiles

Contains shape files of timber sites, Processing Ports and Factories, and Trunk Roads, along with The OS ITN layer of Links and Nodes (obtained via Transport Scotland)