Network Information Services

A Mouchel and Thales joint venture company

# National Traffic Information Service

## NTIS Spatial Network Topology: Data Sources and Business Rules

## NIS N Network Model Data Sources and Business Rules

**Revision 1.1**

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# Document Control Sheet

| Version History | | | | |
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| **Version** | **Date** | **Author** | **Description of Updates** | **Status** |
| 0.1 | 21/03/13 | Chris Cowen | First Draft | Draft |
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| | | | | |

| Contractual Details | |
|---|---|
| **Objective of Document** | To describe the Data Sources and Business Rules for the NTIS Spatial Network Topology |
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# Contents

# 1 Purpose

This note describes the Business Rules and Data Sources that are used to create and maintain the NTIS spatial network topology. There are numerous other sources of information that form part of the NTIS Network Model however this paper is focusing on the spatial aspects of the model.

Please note maintenance of assets is not in the scope of this paper, however assets locations have been used to define the extent of the network and will continue to be used as such going forwards.

# 2 Introduction

The NTIS Spatial Network Topology is based on the heritage NTCC Network Model, however, there have been modifications in the extents and the network topology rules as requirements have changed.

# 3 NTIS Spatial Model Extents

The NTIS network extents are described as follows:

| Acronym | Definition |
|---|---|
| **"National Traffic Information Service (NTIS) Network"** | the NTIS Network is the full extent of the roads for which the Agency is the Highways Authority plus other Highway Authority roads (including in Scotland and Wales) that are of business interest to the Agency because:<br><br>(a) they link separate parts of the SRN together;<br><br>(b) they are Agency agreed Diversion routes off the SRN; or<br><br>(c) they contain assets belonging to the Highways Agency or NTIS, in which case the NTIS Network must include non-SRN roads connecting to those assets.<br><br>the collection of Traffic Data is limited to the NTIS Network. Forecast and Current Events will be collected from where they are occurring whether On or Off the NTIS Network and the location of their impact will be collected for the NTIS Network. |

This translates to the following broad groupings of roads.

| Road Grouping | Source |
|---|---|
| HA Strategic Road Network (SRN) | HAPMS June 2012, NTCC Heritage Network |
| Non SRN Roads with HA Civil and Electronic Assets located upon them | CCTV<br><br>Fixed Text Message Signs (FTMS)<br><br>Emergency Roadside Telephones (ERT)<br><br>Roads in COBS not on network<br><br>**Note: Extent will be updated to cover any missing roads required by IAM IS Civil Asset System (when available)* |
| Scotland and Wales | Roads from the above SRN and Asset Definitions crossing borders that end at significant places e.g. Cardiff. |
| West Midlands Centre of Excellence (formerly Matisse) Roads | Primary A-road routes from the following West Midlands Local Authorities (required as part of a bid promise):<br><br>- Birmingham<br>- Wolverhampton<br>- Solihull<br>- Sandwell & Dudley<br>- Coventry<br>- Walsall |
| Agreed Local Diversions | TBD – subject to commercial discussions |

# 4 NTIS Spatial Network Topology Rules

- All ‘A’ road links will be split at all ‘A’ road junctions.
- Roads are modelled by carriageway. That is there will be a separate link for each direction of travel.
- All roundabouts will be modelled (regardless of the road number of the intercept road).
- Any standard grade separated junctions will be modelled complete with slip roads (regardless of the road number of the intercept road).
- All motorway junctions will be modelled
- For each new junction, a junction object will be created with an appropriate name
- Roads or parts of roads must be contiguous and form part of a navigable network.
- HAPMS sections for Ox bow lay bys will not be included in the NTIS Network Model
- HAPMS sections for lorry parks or depots will not be included in the network model.
- Minor Roads. Where HAPMS gives the road a number but all other source material indicates that it is a minor road the HAPMS classification will be used.

Where NTIS network roads intercept each other it must be possible to navigate through the junction as in the real world. As a consequence there may be the need for "Box" configurations of small links to ensure navigability. Please note this is only relevant to NTIS network intersections. On the V1 network most of these intersections are roundabouts and therefore do not require "box" junctions. Roundabouts can be incomplete (the links between the opposite carriageways are not modelled) where the intercept roads are non project network roads. Where the roads are project network roads then full roundabouts are required. Note a number of incomplete roundabouts will be fixed in version 5 of the NTIS network model.

# 5 NTIS Spatial Topology Model Creation

A four step process was envisaged to create the initial Model (V1, V2, V3 and V4), gradually increasing the extents while applying the new Network Topology Rules.

- Version 1 of the NTIS Model was equivalent to the NTCC model (Version 19)
- Version 2 of the NTIS Model creation applied the new Network Topology Rules to the Version 1 model.
- **Version 3** of the NTIS Model creation extended the Version 2 model to include additional extents (see Appendix A). This Model is seen as a major milestone that has been deployed with ongoing versions generally regarded as maintenance updates.
- Version 4 of the NTIS Model creation was initial intended to extend Version 3 to incorporate 500 miles of Agreed Local Diversion Routes however this will now be incorporated into Version 5 as Version 4 has been used as a minor revision due to ongoing discussions around the agreed diversions.
- Version 5 of the NTIS Model creation is anticipated to include fixes to incomplete roundabouts to ensure navigability across these features.

For NTIS network roads that are part of the SRN the data sources used for initial model creation are not the same as those used for maintaining the network model, although there is some overlap in sources.

For NTIS network roads not part of the SRN the maintenance and creation sources are the same as those used for initial creation.

Version 3 of the network model is currently in use and it includes all road groupings except the Agreed Local Diversion extensions to the network. Appendix A shows the full list of data creation sources used in creating the NTIS model including the source dates.

# 6 NTIS Spatial Topology Model Maintenance

The NTIS Model maintenance is different depending on whether the roads being reviewed are owned by the Highways Agency (SRN) or not.

For the SRN roads are maintained primarily from Major Project Scheme Blueprints provided in advance of the scheme being commissioned and minor network changes identified in HAPMS (or in the future IAM IS). These sources are used to digitise a spatial representation of the new roads.

For roads off the SRN the maintenance sources will be the Ordnance Survey Vector Maps dataset.

It is anticipated that updates to the model will be approximately quarterly; however these dates need to be pre-agreed with the Highways Agency.

# 7 Appendix A: Network Model V3 Initial Creation Data Sources

| Extension Data Source Name | Data Source Description | Extension Data Source Date | Data Source Organisation | Spatial Data Source (& Date) | Network Model Version | Used as Maintenance Source |
|---|---|---|---|---|---|---|
| OSCAR | Precursor to the OS ITN dataset | 2003 (Estimate) | Ordnance Survey | OSCAR 2003 (Estimate) | V1 | No |
| Video Survey 2 | Project Align – updates to the network model to bring it up to date at that time. | 2007 | Serco | GPS (2007) | V1 | No |
| Video Survey 1 | Initial Video Survey at start of previous NTCC contract | 2001 (Estimate) | Serco | GPS (2001) | V1 | No |
| SRN Network Change from HA Major Projects Team | Identified changes to the network from spatially referenced plans. | Ongoing | Scheme Designs | Digitised from Geo-referenced Scheme Plans (Ongoing) | Ongoing | Yes |
| ERT | Sections of roads added to capture all ERT (Emergency Roadside Telephone) equipment. | December 2011 | Highways Agency (Atkins) | OS 1:10,000 Raster (2011)* | V3 | Yes |
| HAPMS_Additions | Sections of roads added to bring Version 2 of the NTIS Network Model in line with HAPMS as of September 2011 | September 2011 | HAPMS | OS 1:10,000 Raster (2011)* | V3 | No |
| ANPR | Sections of Roads added because of the existence of ANPR equipment upon them. | June 2012 | NTIS | OS 1:10,000 Raster (2011)* | V3 | Yes |
| HAPMS_Update | Sections of roads added to bring Version 2 in line with HAPMS as of June 2012 | June 2012 | HAPMS | OS 1:10,000 Raster (2011)* | V3 | No with regards to HAPMS – However it is anticipated that NTIS and IAM IS will need to keep in sync |
| Motorway Additions | Addition of all Motorways that were not in Version 1 identified from Ordnance Survey datasets | OS 2011 | Ordnance Survey | OS 1:10,000 Raster (2011)* | V3 | No |

| | | | | | | |
|---|---|---|---|---|---|---|
| Motorway connectors | Sections of roads added to connect Motorway Additions to the rest of the network to ensure full network topology. | OS 2011 | Ordnance Survey | OS 1:10,000 Raster (2011)* | V3 | No |
| Remodel | Re-modelling the network where it was determined that the current network differed from that in Version 1 | OS 2011 | Ordnance Survey | OS 1:10,000 Raster (2011)* | V3 | No |
| Re-trunks | Sections of roads that had been de-trunked but were added because of equipment upon them | OS 2011 | Ordnance Survey | OS 1:10,000 Raster (2011)* | V3 | No |
| Revised COBS | Sections of Roads added because of the existence of COBS equipment upon them. | As at 6th Feb 2012 | Site Data | OS 1:10,000 Raster (2011)* | V3 | Yes |
| TAME O.N. | Sections of Roads added because of the existence of TAME equipment upon them. | As at 1st Feb 2012 | NTIS | OS 1:10,000 Raster (2011)* | V3 | Yes |
| TeleAtlas Conflation | Re-models identified from comparing Version 2 with the TMC/TeleAtlas layer provided by INRIX.<br><br>*Used Google Earth imagery to resolve conflicts between TeleAtlas and NTIS models. | As at 1st Feb 2013 | TeleAtlas/TMC Layer | TeleAtlas Map Database (Sept 2012) | V2 | Yes |
| Wales And Scotland | Sections of Roads added that are strategic routes into Scotland or Wales. | OS 2011 | Ordnance Survey | OS 1:10,000 Raster (2011)* | V3 | Yes |
| West Midlands Centre of Excellence (WMCoE) | Sections of Roads added that are part of the West Midlands Centre of Excellence | OS 2011 | Ordnance Survey | OS 1:10,000 Raster (2011)* | V3 | Yes |

*Note this product is being withdrawn by Ordnance Survey hence NTIS will move to the Ordnance Survey Vector Maps Local product.