



A

A Scoping Study investigating the implementation of the Last Planner® System/ Collaborative Planning and collaborative working practice in the UK road transport sector.

Appendix B

Supplementary information on UK road network

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Statement of purpose

This document is an appendix to a scoping study investigating the implementation of the Last Planner® System/collaborative planning and collaborative working practice in the UK road transport sector. This appendix defines the scope and scale of operation of the UK Highways sector in order to assist the research team to understand the context of the Agency's work.

Why do I need to read it?

Reading this appendix will give you a picture of the UK highway road network and how it is operated, especially for those with little knowledge on the UK Highway road sector. It also enables you to appreciate the importance of the investigation presented in main report.

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Abbreviations

AMI Advanced Motorway Indicator

ANPR Automatic Number Plate Recognition

ASC – Asset Support Contracts

CCTV Closed Circuit Television

DBFO – Design, Build, Finance and Operate

EMI Enhanced Matrix Indicator

ERT Emergency Roadside Telephone

ESS Environmental Sensor Station

HA – Highways Agency

HADECS Highways Agency Digital Enforcement Cameras

LTA – Local Highways Authority

MAC – Managing Agent Contractors

MIDAS Motorway Incident Detection and Automatic Signalling

MS2 Motorway Signal Mark 2

MS3 Motorway Signal Mark 3

NMCS National Motorway Communications System

NRSA – New Roads & Street Works Act 1991

NTIS National Traffic Information Service

OVD Overheight Vehicle Detector

PFI – Private Finance Initiative

RCC Regional Control Centre

SRN – Strategic Road Network

TMC – Term Maintenance Contractor

VMS Variable Message Sign

1.0 Introduction

According to statistics released by the Department for Transport (DfT, 2014), the total road length in Great Britain in 2013 was estimated to be 245.7 thousand miles. The chart below shows the road length by country.

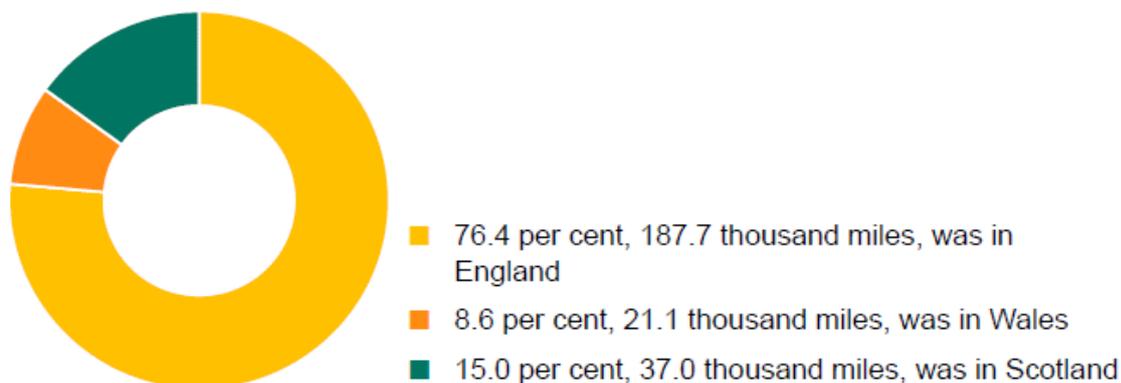


Figure 1 - Road length by country in Great Britain, in 2013 (DfT, 2014).

In the UK, roads are classified as follow:

- Motorways and 'A' roads are referred to as major roads. These roads are also split into trunk roads and principal roads. The former are centrally managed by the Highways Agency, Transport Scotland and the Welsh Government whereas the latter are managed by local authorities (including Transport for London);
- 'B', 'C', and unclassified 'U' roads are referred to as minor roads.

Major roads made up 12.7% (31.4 thousand miles) of total road length while minor roads made up 87.3% (214.3 thousand miles) of total road length. The following chart shows the distribution of road length by road type (DfT, 2014).

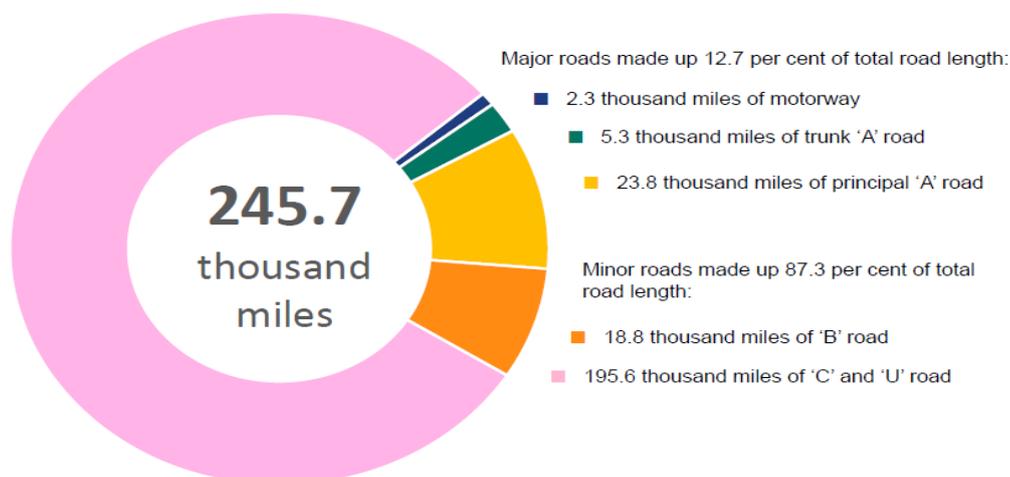


Figure 2 - Road length by road type in Great Britain, in 2013 (DfT, 2014).

Although major roads accounted for only 12.7% of total road length in 2013, they carried 65.6% of total road traffic. In contrast, minor roads made up 87.3% of total road length, but carried only 34.4% of total road traffic. The chart below shows the percentage of road length compared with the percentage of road traffic carried, by road type in 2013 (DfT, 2014).



Figure 3 - Percentage of road traffic and road length by road type in Great Britain, in 2013 (DfT, 2014).

Further information on roads lengths, including charts and detailed information for Great Britain as a whole and also by country, region, and by local authority can be accessed through data tables available at the following link: <https://www.gov.uk/government/statistics/road-lengths-in-great-britain-2013>.

Next, an overview regarding the management and maintenance of the road transport network in the UK will be provided. The objective is to better understand the full scope of the sector in order to enable the achievement of an integrated road system and supply chain.

2.0 Highways Agency

2.1 Overview

Under the **New Roads & Street Works Act 1991**¹ (NRSWA) the Highways Agency (HA) is Highways Authority for the **Strategic Road Network** (SRN). The HA operates, maintains and improves the SRN in England on behalf of the Secretary of State for Transport. Sections of the Highways Agency's roads fall within **Local Highways Authority** (LHA) areas, but the LHAs have no responsibility as a highway authority or street authority for the Agency's SRN. The network also interfaces with Transport Scotland and Road Services for Northern Ireland

The SRN in England is some 4,300 miles long and is made up of motorways and trunk roads — the most significant 'A' roads. Local and regional authorities manage other UK roads. While the agency's network represents only two per cent of all roads in England by length, it carries a third of all traffic by mileage. Significantly, two thirds of all heavy goods vehicle mileage in England is undertaken on the SRN, making it the economic backbone of the country. The UK HA is not only strategic in its role as an executive agency for the Department of Transport it also operates, manages, improves, and maintains over 7000KM of motor ways and trunk roads in England comprising major road networks valued at £105 billion (HA business plan, 2014). Although this represents less than 3% of the entire road network in England, it carries 80% of all traffic in England.

The HA employs **Managing Agent Contractors** (MACs) and **Asset Support Contracts** (ASCs) to manage the SRN in given geographical areas. The Highways Agency has also appointed a number of **Design, Build, Finance and Operate** (DBFO) or **Private Finance Initiative** (PFI) contracts for specific roads in MAC areas. These MAC/ASC/DBFO/PFI contractors have authority to exercise the Highways Agency's legal powers and obligation under the **Highways Act 1980** and NRSWA 1991 and have Value for Money (VfM) efficiency measures. All new schemes above £10M are developed by Major Project Directorate (MPD). These are done under the Construction Management Designs Framework (CMF) and the Construction Design. Schemes below £10M and maintenance work are executed by Network Delivery Directorate (NDD).

Available at: <https://www.gov.uk/government/collections/new-roads-street-works-act-1991-highways-agency-responsibility> According to the HA's website the agency also manages and helps prevent incidents on England's motorways through the **Traffic Officer service**². Overall, the responsibilities of the agency include:

¹ The New Roads and Street Works Act 1991 can be accessed through the following link <http://www.legislation.gov.uk/ukpga/1991/22/contents>

² Further information about the Highways Agency Traffic Officer service is available at <https://www.gov.uk/government/organisations/highways-agency/about/about-our-services>

Overview of UK road network (Appendix B)

- Carrying out routine maintenance of roads, structures and technology to make the network safe, serviceable and reliable;
- Undertaking large scale improvements through a programme of major schemes;
- Making sure traffic can flow easily on major roads and motorways;
- Managing and clearing incidents as quickly and safely as possible;
- Setting and maintaining technical standards for roads (used by the HA and other road networks).

The following map shows the network managed by the HA and areas for maintenance and improvement of the trunk road network. It includes the roads that make up the SRN and operational areas and general contact details of HA's contractors, DBFO and PFI companies.



Figure 4: Highways Agency Network Management Map

2.2 Definition of common terms

The website of the Department for Transport⁴ provides definitions for terms commonly used in the management of the road network. These are presented as follow.

2.2.1 Street works

Refer to works carried out by statutory undertakers, or licensees under section 50 of New Roads and Street Works Act 1991 (NRSWA), or their contractors, to install, inspect, maintain, repair or replace apparatus.

2.2.2 Road works

Road works (or “works for road purposes”) refer to works usually carried out by highway authorities to repair, maintain or replace highways, which under highways law includes the footway or pavement. This will include works to replace or maintain street lighting, even if carried out on behalf of the council by an electricity distribution company.

According to the Highways Agency website there is no central database of road works, however many local authorities make information available through the ELGIN website (www.elgin.org.uk).

2.2.3 Statutory undertakers

Most utility companies (e.g. water, electricity, telecommunications, gas, sewers) are statutory undertakers. Statutory undertakers have a statutory right or duty to install, inspect, maintain, repair, or replace apparatus in or under the street in primary legislation. The legislation is:

- Gas Act 1986 as amended by the Gas Act 1995 (schedule 3);
- Electricity Act 1989 (schedule 4);
- Water Resources Act 1991 (section 159);
- Telecommunications Act 1984 as amended by schedule 3 of the Communications Act 2003.

It is worth mentioning that the legislation that defines the responsibilities and obligations between councils and utility companies is the New Roads and Street Works Act 1991. These companies are responsible for their own works (e.g. excavations, reinstatements), but they are legally obliged to give notice of their intention to work to the appropriate local highway authority. The role of the highway authority is to monitor the works and to coordinate them with any other highway works so that disruption is kept to a minimum.

⁴ The definitions presented in this section along with a number of frequent asked questions related to street works can be accessed through <https://www.gov.uk/government/publications/street-works-faq>

2.2.4 Local highway authority

In areas with single tier (“unitary”) authorities this is the local council. In two-tier areas (i.e. where there are district councils and a county council), it is the county council that is the local highway authority.

In London, for those roads that form the London strategic route network (LSRN) the local highway authority is Transport for London, otherwise it is the London Borough Council.

For motorways and trunk roads the highway authority is the Highways Agency.

2.3 Service Providers

According to the National Guidance Framework for Operational Activities⁵ between Local Traffic Authorities and the Highways Agency (NGF, 2007), service provider(s) refers to MAs, MACs (Managing Agent Contractors), TMCs (Term Maintenance Contractor), DBFO (Design, Build, Finance, and Operate) and Toll concessionaries and any contractor or subcontractor working on behalf of the Highways Agency and subject to the Highways Agency’s directive.

Service providers within the Area are responsible for delivering the operations and maintenance service for their sections of trunk road. Area Network is responsible to the Area Performance Manager for:

- Coordinating arrangements for planned works and events within the LTA;
- Developing contingency plans for the Area (including agreement of tactical diversion routes with LTAs, the police and the Traffic Officer Service);
- For working with the LTA to establish the signing and other infrastructure requirements for tactical diversion routes, and
- For producing, maintaining and distributing documentation of agreed routes and operational protocols for their use to the interested stakeholders.

The service provider also assists the Traffic Officer Service when required with implementing traffic management for incident management, including putting tactical diversion routes into operation.

Contact details on service providers can be found at the Highways Agency Network Management Map (**Error! Reference source not found.**). Also, in England, the HA have divided the country in areas which are managed by specific teams. These will be presented as follow.

2.4 Area Teams

Most Highways Agency road projects are managed by one of 13 Area Teams covering the whole of England (6). Some larger projects have dedicated management teams or are managed by private contractors.

⁵ The National Guidance Framework for Operational Activities between Local Traffic Authorities and the Highways Agency can be accessed through http://www.tih.org.uk/images/2/26/NGF_2007.pdf



Figure 6: Area Team

Available at:

<http://webarchive.nationalarchives.gov.uk/20140603112028/http://www.highways.gov.uk/our-road-network/managing-our-roads/operating-our-network/how-we-manage-our-roads/area-teams/>

The areas are listed below. An example of the details recorded on the web site for each area is shown under the first area in the list (Area 1) as follows:

2.4.1 Area 1 – Cornwall & Devon

Area description

The network in Area 1 Figure 7 travels across Devon, Dorset and Cornwall. It consists of the A30 and the A38 all purpose trunk roads to the west of M5 junction 31 and the A30 from the M5 junction 29 to the eastern end of the Honiton bypass and the A35 Honiton to Bere Regis. The approximate length of the all purpose trunk road in Area 1 is 243 miles.



Figure 7: Area 1

Contractors

The Highways Agency is supported in managing the A30 and A38 to the west of M5 junction 31 by our Managing Agent Contractor who is EM Highway Services Ltd. This contract started in July 2010 and is due to end in June 2015.

The A30 from the M5 junction 29 to the eastern end of the Honiton bypass and the A35 Honiton to Bere Regis is operated and maintained by Connect A30/A35 Ltd. The project began on 1 October 1996 as part of the Government's Private Finance Initiative. The road is run as a private venture and the contract runs until 2026.

The Tamar Bridge, which carries the A38 over the River Tamar is owned and operated by the Tamar Bridge and Torpoint Ferry Joint Committee.

Adjacent to this suspension bridge is the Saltash Tunnel, which is unique in Europe incorporating a 3 lane tidal flow system, controlled by overhead signs and illuminated road studs. The tidal flow system extends across the Tamar Bridge. Information about the Saltash Tunnel, and how to use it safely, is provided on the Saltash Tunnel Safety page⁶.

Projects

A list of Area 1 road projects is available on internet⁷ so people can view which projects are planned, current and complete.

The other areas are:

Area 2 – Somerset, Avon, Wiltshire & Gloucestershire

⁶ Saltash Tunnel Safety page can be found at <http://webarchive.nationalarchives.gov.uk/20140603112028/http://www.highways.gov.uk/our-road-network/managing-our-roads/operating-our-network/how-we-manage-our-roads/area-teams/area-1/a38-saltash-tunnel-your-safety-2/>

⁷ List of Area 1 Road Projects is available at <http://webarchive.nationalarchives.gov.uk/20140603112028/http://www.highways.gov.uk/roads?projectarea=area-1>

Area 3 – Hampshire, Berkshire, Surrey, Oxfordshire, Dorset & Wiltshire

Area 4 – Kent, Surrey, East Sussex & West Sussex

Area 5 – M25, link roads to GLA Boundary, Berkshire, Buckinghamshire, Hertfordshire, Essex, Kent & Surrey (M25 Area)

Area 6 – Essex, Cambridgeshire, Suffolk & Norfolk

Area 7 – Leicestershire, Northamptonshire, Derbyshire, Nottinghamshire, Lincolnshire, part of Warwickshire, Rutland & part of Oxfordshire

Area 8 – Cambridgeshire, Bedfordshire, Hertfordshire & part of Suffolk

Area 9 – West Midlands, Hereford, Worcestershire, Shropshire, Warwickshire & Staffordshire

Area 10 – Cheshire, Merseyside, Greater Manchester & part of Lancashire

Area 12 – Yorkshire & Humberside Ports Motorways

Area 13 – Cumbria & parts of Lancashire

Area 14 – Northumberland, Tyne & Wear, Durham & North Yorkshire

2.5 Local Authorities

As noted earlier, the HA does not manage all roads in Britain. Roads in England not shown on the Map are managed by Local Authorities (please see links for access below). Trunk roads and motorways in Scotland are the responsibility of Transport Scotland⁸ and those in Wales are the responsibility of the Welsh Assembly Government⁹.

To find the appropriate Local Authority in England access the following link
<http://www.local.direct.gov.uk/LDGRedirect/Start.do?mode=1>

To find the appropriate Local Authority in Scotland access the following link
<http://www.cosla.gov.uk/scottish-local-government>

To find the appropriate Local Authority in Wales access the following link
<http://wales.gov.uk/topics/localgovernment/?skip=1&lang=en>

3.0 Communication Technologies used on Highway Agency Road Network

The place of information and communication technology in supporting effective delivery of business venture cannot be underestimated. The Highway Agency

⁸ Link to the webpage of Transport Scotland is <http://www.transportscotland.gov.uk/>

⁹ Link to the webpage of Welsh Government is <http://wales.gov.uk/?skip=1&lang=en>

occupies a strategic position in the UK economy. Its activity directly influences the economic activities across the region. To make its services more efficient and effective, the HA has invested in various forms of communication technology for an enhanced customer satisfaction. This section describes some of these communication technologies used in managing the HA road network.

3.1 Historical development in the use of technology on HA road Network

The use of technology in managing the HA road network dates back to many decades (HMSO, 2001). The National Motorway Communication System (NMCS) is the official document that records and reports the developments in communication technology used in managing the HA road network in the past 40 years. The HA, has been improving its communication technology to meet the yearnings of its road users. Specifically, between 1958 and 1997, different forms communication technology has been developed to address the need of its teeming customers. Table 1 shows the various forms of technology introduced for managing the road network. As seen in the timeline, the HA has been proactive in its choice and use of technology in managing the road network. It also shows that the organisation is not static but dynamic in meeting the need of its consumer, technology wise.

Table 1: Highways Agency communication technology milestones

Principal Motorway Communications milestones	
1958	Preston by pass opens
1959	Post Office telephones installed
1964	M5 Worcester signs
1965	M4 Heston signalling and loop system installed and Heston CCTV system installed
1966	Phase 1 telephones first installed
1968	Severn Bridge system installed
1969	Heston computer-based system commissioned
1970	NMCS 1 installation programme commences M18 Wakefield South Yorkshire computer system installed Westhoughton CP301 commissioned
1971	Midland links CCTV installed Perry Barr CP301 commissioned
1972	Scratchwood CP301 commissioned
1973	Almondsbury CP301 commissioned
1974	Lane and Motorway Divert software put into service
1978	Control Office type CO304 introduced

Principal Motorway Communications milestones	
1980	Coleshill national computer CP 305 installed
1981	M1 enhanced signals trial Telephones adapted for hearing aids introduce
1984	Control Office type CO306 introduced
1987	M6 ramp metering trial Tidal flow signalling on A38(M) introduced
1988	M1 automatic incident detection trial equipment made operational M25 NMCS2 trial schemes installed at Chigwell, Godstone, Welwyn and Heston Control Offices
1989	Stop 'red X' and 'End' signal aspects introduced
1991	Manchester NMCS2 system introduced
1995	Controlled motorways pilot scheme on M25 launched
1996	New cabling standard trial on A1(m)
1997	Midlands Driver Information System put into service

3.2 Technology used in Managing HA road Network

The UK road network is codified and managed with different technologies. These technologies include, but not limited to the following:

1. Incident and Queue Detection
2. Emergency Telephones System
3. Motorway Signalling System
4. Closed Circuit Television (CCTV)
5. Highways Agency Digital Enforcement Cameras
6. Highways Agency Weather Information Service
7. Instation Equipment (including Traffic Learning Centre)
8. Motorway Incident Detection and Automatic Signalling
9. NTIS Automatic Number Plate Recognition cameras
10. NTIS Traffic Appraisal Monitoring and Economics sites
11. NTIS Traffic Monitoring Unit sites

12. Overheight Detectors
13. Tidal Flow Equipment
14. Road Traffic Signals

Some of these technology will be described in the subsequent section to further show their specific role in managing the HA road network, especially in relation to meeting its customers demand. The goal of the HA is not only to provide safe and reliable journey, but also to keep its customer well informed. This explain the importance of the above mentioned technology in managing the HA road network.

3.2.1 Motorway Signalling

The Motorway Signalling is a system that enables road users to use the road network effectively. It provides early warning signals to road users for appropriate actions. The Motorway Signalling system includes; Post mounted Signals, Post mounted Matrix Signal, Motorway Signal mark 2, Motorway Signal mark 3 and gantry mounted lane Signal. They provide road users with useful information on the operation of the road network.

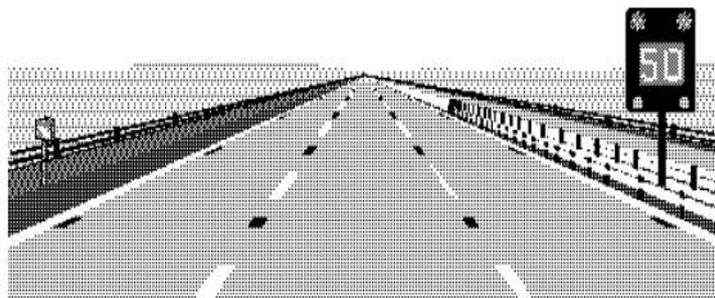


Figure 8: Post mounted signal

While Post mounted Signal (Figure 8) tends to indicate speed limits, other elements such as Gantry mounted lane Signal in Figure 9 display the different restriction on each lane. It displays information such as temporary maximum speed limit, lane closer, and risk of fog ahead among others. Gantry mounted signal are usually provided on busy roads with over three lanes to provide matrix indicator over each lane as shown in Figure 9.

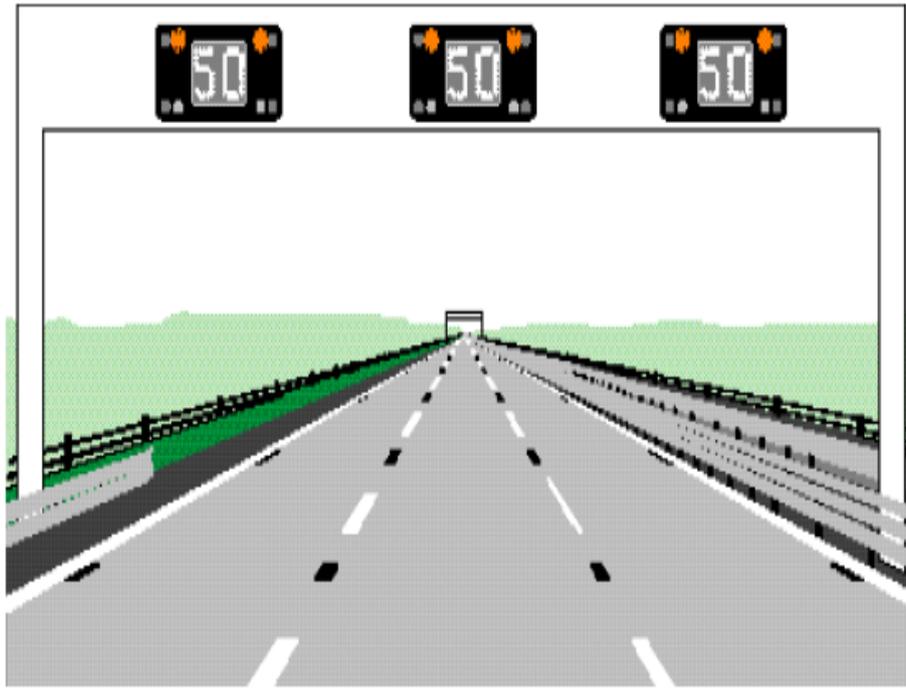


Figure 9: Gantry mounted lane Signal

However, on a busy motorway, the outreach arms post mounted on column is usually used. The design allows for larger indicators as shown in Figure 10, known as Enhanced Matrix Indicator (EMI).

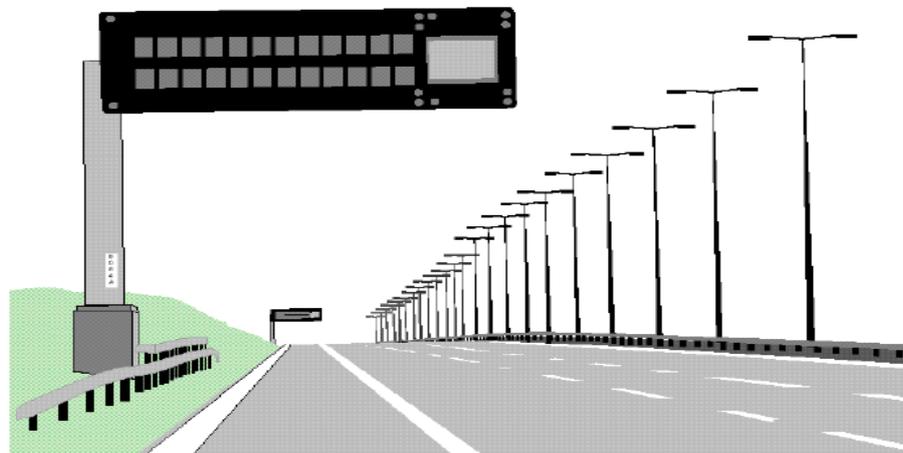


Figure 10: Enhanced Matrix Indicator and 2 x 12 Enhanced Message Sign

It could be used on four lanes with capacity of displaying text message. A more recent Motorway Signal is the Motorway Signal Mark 3. It has the capacity to display large useful information for road users such as disruption or restriction on the network as shown figure 11.



Figure 11: Motorway Signal Mark '3'

The information displayed in the various motorways signalling system keeps the road users well informed and supports them in making best alternate decision on their journey.

3.2.2 Closed Circuit Television (CCTV)

Provisions are made for CCTV (Figure 12) on all the HA road network to capture and relay real time images of activities on the network. The information enables the agency to make decision on the right support to be provided for road users. Specifically, the CCTV allows the HA to understand the traffic condition in real time and the operation of each network. More importantly, it allows the Agency to respond immediately to all incidents that occur on the highway.



Figure 12: Post mounted CCTV Camera

However, for the CCTV to capture the entire image as required, it must be positioned at the right angle and position specified.

3.2.3 Highways Agency Digital Enforcement Cameras (HADEC)

Despite the provision of speed limits on all road networks, the tendency to go above these set limits is still high among road users. This action is not only harmful to the perpetrator, but to other road users. In a bid to ensure full compliance with the

mandatory variable speed limit on the network, the HA has installed speed cameras. The HADECS captures the information of any road user that goes above the mandatory speed limit displayed by the Advanced Motorway Indicator (AMI) (TMMM, 2013). The enforcement equipment stores the data of the offender which is admissible in court. This no doubt improves the level of compliance with the mandatory variable speed limit, since most road users will naturally want to avoid being prosecuted.

3.2.4 Emergency Telephones System

The Emergency Telephones are installed on motorways and other Trunk Road. They are provided at specific intervals along the motorways to enable road users to call for help in an emergency. The Emergency Roadside Telephone is connected to the Regional Control Centre such as the emergency number “999”. Through this service, road users are opportune to seek for the needed assistance in time of danger on the motorway.

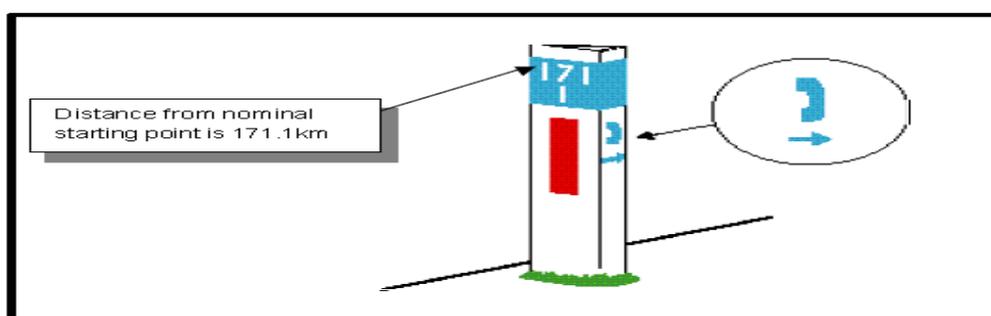


Figure 13: Marker post

Furthermore, marker post are used to give the direction to the nearest available road side telephone.

3.2.5 Highways Agency Weather Information Service

The HA obtains weather information using the Environmental Sensor Stations (ESS) and the Met Sub-system. They are usually installed in the carriageway or road side to provide weather information to the HA. The weather information obtained through the (ESS) are conveyed to the HA Weather Central Service. It is worth to state that the Met Sub-system provides real time weather information to HA, thus safe guiding road users.

3.2.6 Motorway Incident Detection and Automatic Signalling (MIDAS)

The MIDAS is an automatic system designed to respond to traffic situations such as congestion or incident that could lead to queuing for road users. It provides protection against queuing through its automatic signalling system. It achieves these objectives by giving advance warning for road users to slow or remain stationary so as to improve the traffic situation. Furthermore, on busy motorways, the MIDAS ensures or suggests the appropriate speed limit on controlled motorways. It also provides traffic data used in Ramp Metering System (TMM, 2013)

3.2.7 NTIS Automatic Number Plate Recognition (ANPR) cameras

National Traffic Information Service (NTIS) is a vital communication technology on the HA road network. It enables the HA to deliver some of its major goals such as safe road, reliable journey and provision of information for road users. It uses the Automatic Number Plate Recognition (ANPR) to provide real time traffic information to the general public, reduce congestion caused by incidents and road work on the motorway. It also provides useful information on diversion when necessary for road users, thus minimising delays and discomfort.

3.2.8 Overheight and High Vehicle Detector

This is a technology that determines the maximum height a vehicle can attain in a given location. The detectors and its associated equipment are installed at the roadside. The Overheight Detector (OVD) is installed to protect low structures from collision and damage. The system is designed to detect overheight vehicle at a defined height as it approaches the restricted structure at a specified distance. On detecting the overheight vehicle, the driver will be notified via a message which will be displayed on the Variable Message sign (VMS). This technology helps in preventing hazard on the motorway.

3.2.9 Tidal Flow Traffic System

The system is used to control the direction of traffic on multiple lanes that lack central reservation. The technology helps to control the number of moving lanes in a specific direction to accommodate the traffic volume, thus reducing congestion. Each running lane is controlled by the Regional Control Centre (RCC) and it is used mainly when the traffic is at its peak. This technology enables the HA to maintain a steady flow of traffic on the road network.

3.3 Control Office Base System (COBS)

All the sub-systems described earlier are centrally controlled from the Control Office Base System (COBS). The figure below shows how the system allows the technology to integrate and deliver information to the road users.

responsibility for a section of highway or a highway network and which may have an interest in operational liaison with the Agency (HA), This includes, for example, the National Assembly for Wales, Transport Scotland and the Northern Ireland Roads Service. Further information on the Welsh and Scottish highways authorities are provided as follows.

Wales

The National Assembly for Wales is the highway authority responsible for maintaining, operating, and improving motorways and trunk roads in Wales (whereas local authorities¹⁰ are responsible to look after all other public roads. The work undertaken by the Wales Assembly includes:

- Constructing new roads and improving existing ones;
- Renewing roads, bridges and other structures;
- The day-to-day maintenance, including winter maintenance.

The roads classification in Wales is similar to the categorisation presented at the introduction of this report. However, the definitions presented at the end of the Statistical Bulletin of the Welsh Government on road length and conditions (SB 122/2013) are more detailed than the ones presented by the Department for Transport (DfT, 2014), so they will be presented as follow.

- Motorway: roads identified as M on road signs and which are reserved for use by certain types of traffic only. The A48(M) is included in this group;
- Trunk road: comprises the national network of strategic routes which cater for the through movement of long distance traffic for which the Welsh Government is the highway authority. The network comprises some of the all-purpose roads (A roads), which are open for use by all classes of traffic, and special roads such as motorways. For all other public roads, the local authorities are the highway authorities;
- County roads: also known as *Principal classified roads*. Roads of regional and urban strategic importance;
- B and C roads: also known as *Non-principal classified roads*. These distribute traffic to urban and rural localities;
- Minor surfaced roads: also known as *Unclassified*. These are local distributor and access roads.

The Statistical Bulletin of the Welsh Government on road lengths and conditions (SB 122/2013) released on 10th December 2013 shows that the total road length in

¹⁰ To find the appropriate Local Authority in Wales access the following link <http://wales.gov.uk/topics/localgovernment/?skip=1&lang=en>

Wales¹¹ in 2013 was 34,437km. Further information on roads lengths and conditions can be found in the SB 122/2013¹².

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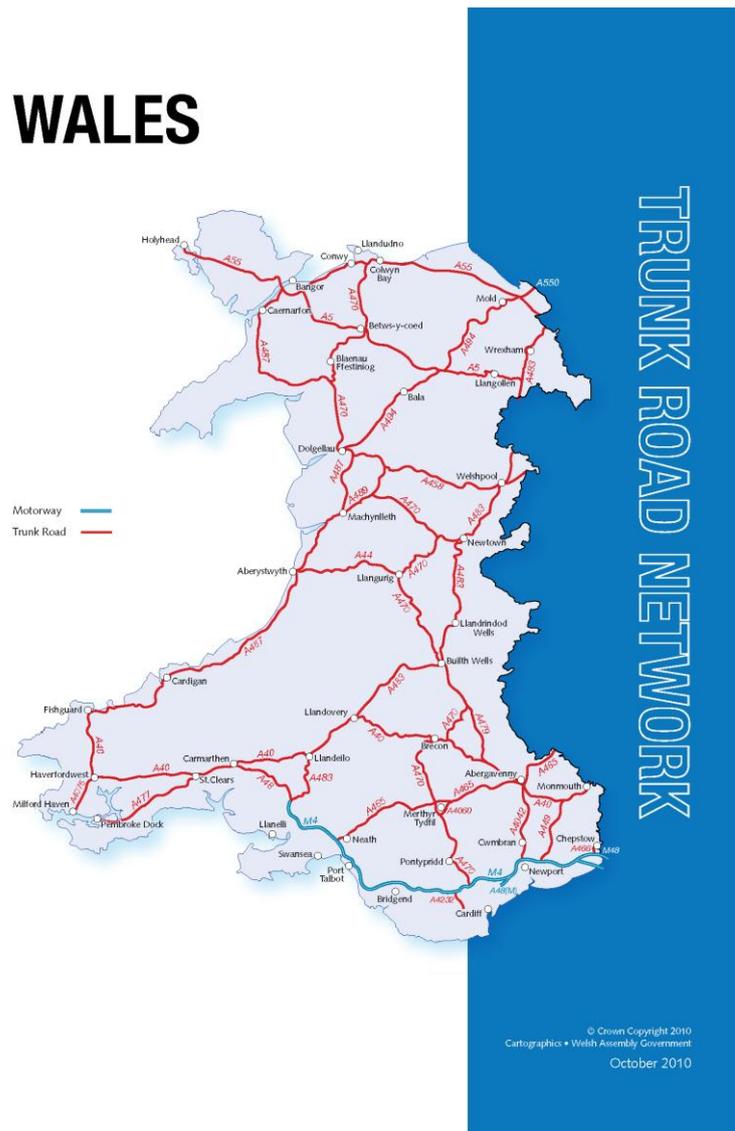


Figure 15: Trunk Road Network in Wales.

As part of the National Transport Plan¹³ (WAG, 2010), major trunk roads have been improved across Wales, particularly at major “pinch points” where congestion can be

¹¹ This figure is slightly different from the number presented by the Department for Transport (DfT, 2014) where the total road length accounted for Wales is 21.1 thousand miles or 33.956km (1mile=1.6093km).

¹² The Statistical Bulletin of the Welsh Government for road lengths and conditions is available at the following link <http://wales.gov.uk/docs/statistics/2013/131210-road-lengths-conditions-2013-en.pdf>

a big problem. Further information about the road projects managed by Welsh Government is available at the following link <http://wales.gov.uk/topics/transport/roads/schemes/?lang=en>

Further information on the National Transport Plan, the Interim Evaluation Report on National and Regional Transport Plan, and other related documents can be accessed through <http://wales.gov.uk/topics/transport/planning-strategies/ntp/?lang=en>

Finally, it is worth mentioning that the Welsh Government has devised a Code of Practice for the Co-ordination of Street Works and Works for Road Purpose and Related Matters. This document can be accessed at

<http://wales.gov.uk/docs/legislation/inforcenonsi/highways/110318highwayen.pdf>

5.0 The challenge for the UK Highways Agency

The Highways Agency will become a public company from April 2015. This implies that the public expectation from it in terms of performance and delivery of service will be high. Table 2 below identifies the enormous responsibilities the Agency has to meet in the coming years.

Table 2: The challenge for the UK highways Agency

Highways Agency to Highways England – April 2015	
Challenges	
Condition	Lack of investment has left our network paying the price. Eg. A large % of surfacing will come to the end of its natural life in the next 5 years.
Capacity	Eg. Forecasts indicate that by 2040, around 32% of the motorway network will experience severe congestion at peak times and poor conditions at other times.
Connectivity	The geography of our network reflects the economy of the past. East / west routes are often poorly served.
Certainty	Investment has been stop-start for generations, making it difficult to build for the future and work with our supply chain to generate efficiencies.
Construction	Construction of housing and creation of jobs has been held back by poor transport connections. Eg. bottlenecks on the SRN at places like the A1 around Newcastle.

¹³ An updated version of the National Transport Plan, based on the “Interim Evaluation Report on National and Regional Transport Plan (WG, 2014)”, will be published in 2015.

As shown in Figure 16, the Highways Agency is to expand its existing schemes so as to deliver more value for the public.

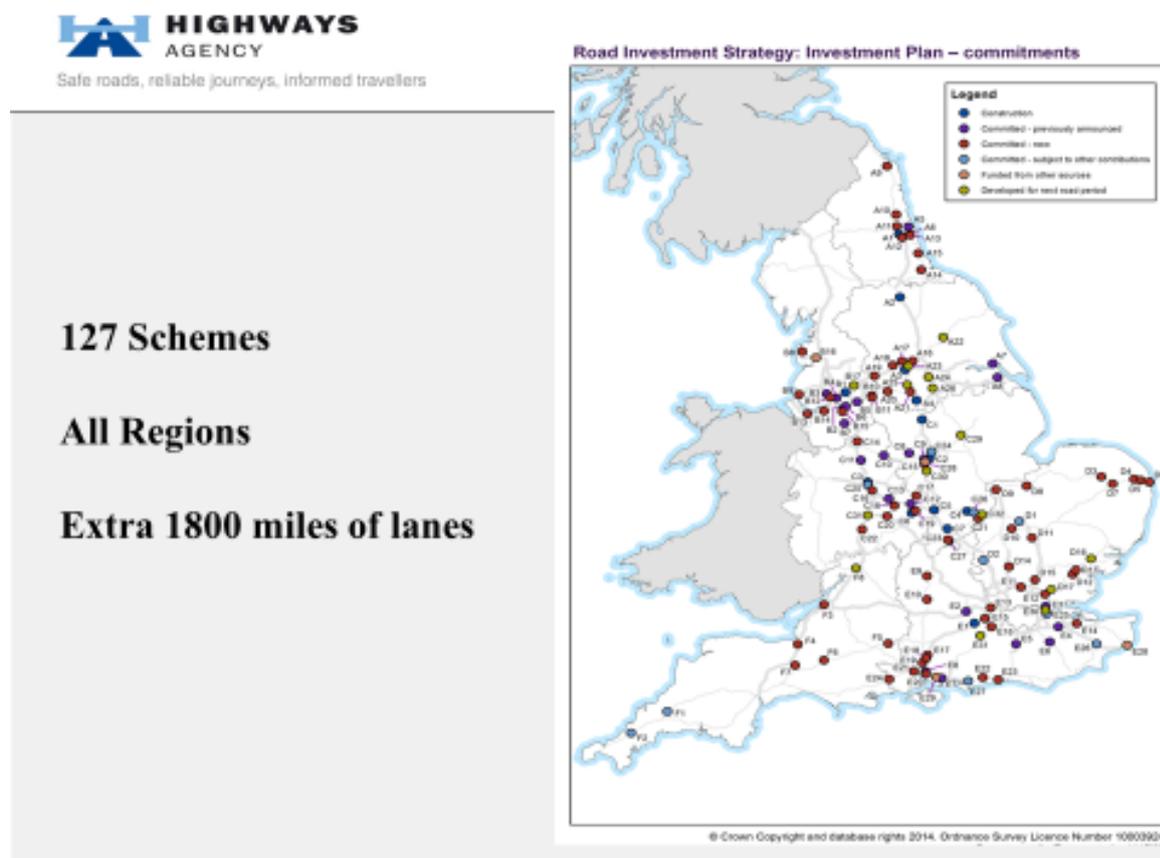


Figure 16: Road investment strategy plan

The goal of the Agency is to deliver the above schemes while ensuring the roads continue to support economic development and not grinding it to a halt. The goal is to deliver £16.4 billion worth of work for £15.2 billion through the application of lean principles. In this ambitious target the application of lean principles is expected to deliver £200 million. This requires the effort of all stakeholders on HA including the supply chain to make this goal achievable.

6.0 Conclusions

The aim of this review is to define the scope and scale of operation of the UK Highways sector and to codify the information that supports the effective management of the network.

The review shows that the HA manages 7000km of the motorway which only represents 3% of the entire road network in England. However, 80% of the traffic in England is carried by the network. This shows how strategic the HA is to the economic development of England. This suggests that more attention must be given

to all that contribute to the smooth running of the network ranging from design, construction and maintenance. This justifies this investigation in relation to reports 1 and 2 that focuses on the implementation of Last Planner and collaborative planning for improvement in construction.

The reviews indicate the HA is committed to satisfying its customers, that is the road users. It has demonstrated this through the various state of the art technology installed on the road network for a safe and reliable journey. These facilities have not only helped the Agency in effectively managing the over 80% traffic on the network, but have also increased the confidence of road users in the Agency.

The review established that the use of technology has greatly supported the Agency in managing the road network. More importantly, the HA is not static in the use of these technology, rather it is dynamically moving and adapting the technology to meet the customer demand.

However, the review indicates the challenge ahead of the Agency as the current forecast indicates increase in the traffic in the next five years. This suggests that the Agency must develop proactive measures to deliver more schemes to meet the increase predicted. The study believes that the application of lean production principle which the Agency has begun to adopt could support in meeting the forecast.

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