Benchmarking Highways England

Our plan for benchmarking Highways England's performance and efficiency

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ORR
OFFICE OF RAIL AND ROAD

Contents

Executive summary

Benchmarking Highways England's performance and efficiency is a core function of the Highways Monitor. The ultimate objective of our benchmarking work is to drive improvements that lead to better outcomes for users of the strategic road network and a more efficient cost to its funders. For example, benchmarking will inform the advice we provide on whether the requirements and funding proposed for the second Road Investment Strategy (RIS2) are challenging and deliverable. It could also help to identify examples of best practice that, for example, would contribute towards Highways England's target to make £1.2 billion of efficiency savings over the first road period (from 2015 to 2020).

There are a wide range of activities that could be benchmarked and there are many possible organisations, both in the UK and overseas, that Highways England could be benchmarked against. In the longer-term, we aspire to Highways England being at the heart of a benchmarking network of comparable organisations that share the data and information required for benchmarking across a wide range of activities.

However, experience from other sectors shows that such benchmarking networks can take several years to establish. Therefore, we are planning a targeted programme of benchmarking activity over the coming year. This will demonstrate the benefits that benchmarking can bring, potentially aid the identification of improvements in the current road period, inform the development of RIS2, and encourage the formation of wider networks.

The development of this programme was informed by a scoping study we commissioned to ensure we have a solid understanding of previous work in this area. This study identified a wide range of previous studies and publicly available datasets. However, it also highlighted the challenge in collating high quality, comparable data across a wide range of activities, metrics and possible comparator organisations, particularly given the lack of pre-existing benchmarking networks for strategic road network managers.

Given this challenge, our planned benchmarking programme prioritises areas where the analysis is most likely to identify improvements in the current road period and inform RIS2 development. There is a focus on internal benchmarking of Highways England's regions and areas, where there is greater certainty over the availability of comparable data. Our short-term plan includes the following projects, looking at Highways England's performance, costs and processes, to:

- capture **datasets of network characteristics**, covering a variety of countries' whole road networks and networks more equivalent to the strategic road network, ensuring the comparability of these datasets, and perform simple comparative analysis of the data;

- carry out **internal benchmarking of Highways England's regions and areas** across its performance specification and, through our stakeholder engagement, explore the potential for wider benchmarking against other highway authorities;

- begin more detailed **benchmarking of safety** across the strategic road network, including analysis of the links between safety risks and star-ratings, comparisons with similar networks elsewhere, and road worker safety;

- work with Transport Focus to consider **benchmarking of user satisfaction**;

- perform **cost benchmarking** of Highways England's operating units (regions or areas), and **real unit operating expenditure** analysis comparing trends in Highways England's productivity with other sectors;

- work with Highways England to develop the quality of its unit cost data and how Highways England will go about **benchmarking the costs and effectiveness of its support functions**; and

- investigate the **potential for bottom-up cost benchmarking** through existing networks.

Many of these projects rely on us obtaining sufficiently robust data, and, for some of the projects, Highways England being able to produce and provide that data. If the required data are not available, or if alternative data sources become available, we will consider alternatives and re-prioritise our plans. We intend to publish a report before the end of 2016, updating on progress with these projects, changes to our plan, and the reasons for those changes. We will also actively engage with our stakeholders at appropriate points to ensure that our work is as informed as possible.

These projects represent the starting point in what will be an ongoing, continuous programme. Over time we plan to work closely with Highways England and other stakeholders to broaden the scope of our benchmarking work and the range of activities it covers.

1. Introduction

Why are we interested in benchmarking?

1.1 The ultimate objective of our benchmarking work is to drive improvements in performance and efficiency that lead to better outcomes for users of the strategic road network and a more efficient cost to its funders. By comparing Highways England's regions or operational units, and by comparing the company as a whole with other organisations, we want our benchmarking work to identify achievable, realistic improvements to performance and efficiency that Highways England can deliver both in this road period and beyond.

1.2 Our benchmarking work will help to identify improvements that could be implemented during the first road period and will inform the setting of performance indicators, targets and the funding available for future Road Investment Strategies (RISs). This will include the development of the second RIS (RIS2, from 2020), preparatory work on which has already started. Many forms of benchmarking analysis require time series data and the schedule for RIS2, which requires us to complete our efficiency review of Highways England by October 2018, does not provide a large amount of time to collect and analyse such data. Therefore, our plan prioritises areas which are most likely to be able to inform the efficiency review and the development of RIS2 as a whole.

1.3 Benchmarking Highways England's performance and efficiency will be a continuous, ongoing process that goes beyond RIS2. It might take several years to set up the networks and collate the data required for sufficiently robust benchmarking in some areas but we plan to begin the process now, to inform future RISs.

The legislative framework

1.4 Section 12(1) of the Infrastructure Act 2015 sets out that the Highways Monitor should exercise its functions in the way that it considers most likely to promote the performance and efficiency of the Strategic Highways Company (Highways England). To meet this duty we must understand Highways England's performance and efficiency both in absolute terms and in comparison with other organisations.

1.5 The Memorandum of Understanding (MoU) between the Highways Monitor and the Department for Transport (DfT)[1] sets out our role with respect to benchmarking Highways England. The MoU is clear that our benchmarking work has a broad scope, covering performance and efficiency, with a wide range of possible comparators, and with the broad objective of informing the development of future RISs, for example by feeding into the efficiency review for RIS2.

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[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411801/mou-orr.pdf

What is benchmarking?

1.6   Benchmarking is essentially the comparison of performance, costs and processes across organisations (or organisational units), with the objective of identifying the best performers and driving improvements in performance and efficiency. There are many different analytical techniques and approaches available (which are discussed in more detail in Annex A) and many different areas that could be benchmarked. For example, our remit covers both performance and efficiency, encompassing the processes Highways England uses in areas like asset management, as well as the performance of its network and the costs of a wide range of different activities.

What do we expect Highways England to do?

1.7   Since the ultimate objective of benchmarking is to identify opportunities to improve performance and efficiency, we expect Highways England to establish its own programme of benchmarking activity and to lead the development of benchmarking networks.

1.8   Highways England is a member of the cross-sector Infrastructure Benchmarking Group, which has begun to share knowledge and processes adopted by other infrastructure businesses, seeking opportunities to share data and learn lessons. This group is developing its work plan for the coming year, which we expect to focus on identifying areas where cross-sector benchmarking is likely to be most useful, and the related data needs. Highways England is also exploring the potential to compare network characteristics and enhancement rates through their shared network valuation contract with Transport Scotland and the Welsh Government.

1.9   We have worked collaboratively with Highways England on the scoping study discussed in the following section and the preparation of this plan. We will continue to work closely with Highways England as both organisations develop their benchmarking programmes, to ensure they are well aligned and complementary. Good quality data is essential to any benchmarking exercise and we expect this collaborative approach to encompass the development and provision of the data needed to support our benchmarking programmes.

2. Understanding benchmarking in highways

Evidence gathering

2.1 Before embarking on our programme of benchmarking analysis, it was important that we had a solid understanding of benchmarking work that has previously been undertaken in the highways sector and the likely availability of key data sources. Therefore, in August 2015 we commissioned KPMG to undertake a scoping study, which we published on 11 February 2016.[2]

Scoping study

2.2 The objectives of the scoping study were to:

- review relevant roads benchmarking studies and assess the quality and comparability of the data used;

- assess the quality and availability of cost and performance information suitable for benchmarking across a range of possible comparators;

- source relevant datasets used in the studies or available via other sources, and where not available, suggest routes to obtain them; and

- identify relevant global benchmarking groups and networks that may be able to assist us in our work.

2.3 We asked KPMG to consider the lessons learnt for benchmarking Highways England, including the applicability and validity of existing studies and materials to the current monitoring regime, and to advise us on which regimes and jurisdictions may be most likely to provide useful information and intelligence. The primary focus was on identifying sources of information and data to benchmark Highways England against domestic and international highways infrastructure managers, but the scope also covered benchmarking against non-highways organisations in relevant areas (such as back-office or support costs).

Key findings from the scoping study

Data quality and availability

2.4 There is a large amount of material relating to the performance and efficiency of highways networks and National Road Authorities (NRAs), including top-down and bottom-up comparisons, surveys and qualitative assessments. The scoping study highlighted:

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[2] http://orr.gov.uk/__data/assets/pdf_file/0015/20805/kpmg-benchmarking-highways-england-february-2016.pdf

- publicly available datasets containing roads performance, and some cost, data;

- several key studies that had attempted to benchmark highways networks or infrastructure managers; and

- that NRAs' annual reports are a potential source of useful information.

2.5   Across these sources there were issues with data comparability and definitions when comparing across countries. Also, much of the data relates to whole road networks, rather than nationally-managed roads comparable to the strategic road network managed by Highways England.

Developing benchmarking networks

2.6   The scoping study also identified several networks and organisations that produce research and statistics on road network performance. Each of these organisations has produced comparative analysis of road network efficiency or performance that may be used to compare Highways England's performance.

2.7   Establishing or tapping into existing networks will help us to collate the comparable data required for benchmarking analysis. It is possible that a number of networks will be required to cover all of the different areas of interest, for example, of NRAs, domestic road authorities or UK infrastructure providers from a range of sectors.

2.8   During the initial phases of our work, some organisations have offered to engage with us on their benchmarking work, but we have already experienced reluctance from a number of parties, in part because of data confidentiality. We recognise that third party facilitation of a benchmarking network (or networks) could help overcome these concerns. We have already engaged with CEDR[3], Infrastructure UK and a number of other organisations, including discussions with the Italian and French road authorities.

Recommendations from the scoping study

2.9   The scoping study contains 20 recommendations for how we could develop our approach to benchmarking Highways England and these are summarised in Annex B. While the recommendations were presented as short, medium and long-term, they could equally have been grouped into four categories or themes:

- developing the benchmarking framework (see section 3);

- stakeholder engagement (see section 3);

- data collection and analysis (see section 4); and

- assessing the economic (and social) impacts of the strategic road network and Highways England's activities (see section 5).
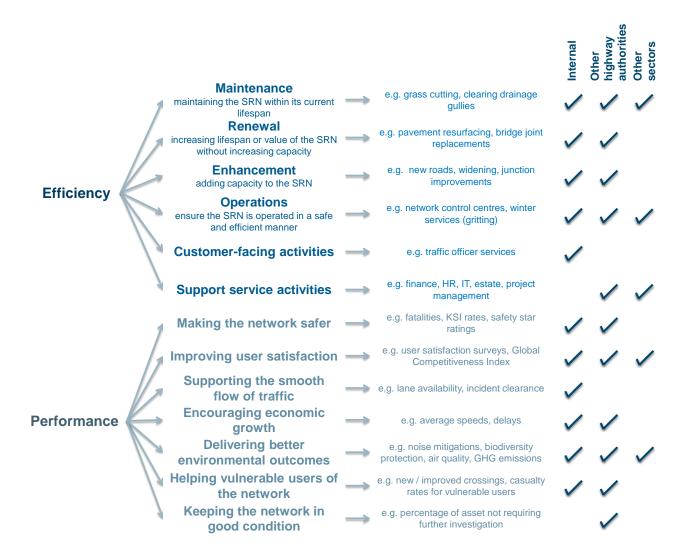
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[3] Conference of European Directors of Roads: http://www.cedr.fr/home/

3. Developing the benchmarking framework

Areas the framework will cover

3.1   As discussed above, our benchmarking remit covers performance and efficiency, which itself covers a wide set of activities, costs and processes. Figure 1 illustrates a high-level framework of the areas we expect benchmarking to cover in the longer-term, based on recommendations from consultancy work that supported roads reform, and the RIS performance specification. It also shows the comparators we expect to benchmark Highways England against.

Figure 1 – Areas to cover in the benchmarking framework

		Internal	Other highway authorities	Other sectors
Maintenance maintaining the SRN within its current lifespan	e.g. grass cutting, clearing drainage gullies	✓	✓	✓
Renewal increasing lifespan or value of the SRN without increasing capacity	e.g. pavement resurfacing, bridge joint replacements	✓	✓	
Enhancement adding capacity to the SRN	e.g. new roads, widening, junction improvements	✓	✓	
Operations ensure the SRN is operated in a safe and efficient manner	e.g. network control centres, winter services (gritting)	✓	✓	✓
Customer-facing activities	e.g. traffic officer services	✓		
Support service activities	e.g. finance, HR, IT, estate, project management		✓	✓
Making the network safer	e.g. fatalities, KSI rates, safety star ratings	✓	✓	
Improving user satisfaction	e.g. user satisfaction surveys, Global Competitiveness Index	✓	✓	✓
Supporting the smooth flow of traffic	e.g. lane availability, incident clearance	✓		
Encouraging economic growth	e.g. average speeds, delays	✓	✓	
Delivering better environmental outcomes	e.g. noise mitigations, biodiversity protection, air quality, GHG emissions	✓	✓	✓
Helping vulnerable users of the network	e.g. new / improved crossings, casualty rates for vulnerable users	✓	✓	
Keeping the network in good condition	e.g. percentage of asset not requiring further investigation			✓

Efficiency groups: Maintenance, Renewal, Enhancement, Operations, Customer-facing activities, Support service activities.
Performance groups: Making the network safer, Improving user satisfaction, Supporting the smooth flow of traffic, Encouraging economic growth, Delivering better environmental outcomes, Helping vulnerable users of the network, Keeping the network in good condition.

3.2   This represents our long-term aspiration. Benchmarking against other highway authorities, especially NRAs in other countries, would likely require the creation of a benchmarking network. Members of any network would ultimately have to agree the scope and definitions of their benchmarking activities, so precisely what is

benchmarked, the comparators used and which organisation carries out the analysis will all depend on the detail of how any benchmarking networks are established.

3.3   Experience from other sectors shows that benchmarking networks typically take several years to set up. Therefore, in the shorter-term we have a role to undertake benchmarking analysis that will inform the development of RIS2 and demonstrate the benefits of benchmarking to encourage the creation of networks in the longer-term.

Analytical methods

3.4   As well as a wide range of areas to benchmark and possible comparators, there are many different analytical benchmarking techniques. These are typically grouped into two categories: top-down and bottom-up, which are discussed in more detail in Annex A. We plan to use a combination of the two, to confirm the validity of the results from each approach.

Principles underpinning the framework

3.5   A range of common principles are typically used to provide an effective framework for assessing the performance and efficiency of an organisation. We intend to apply the following principles when prioritising between the different areas and analytical approaches set out above:

- **consistent** – the metrics should be consistently measured by the regulator / monitor and the regulated / monitored organisation;

- **controllable** – the metrics and approach used to benchmark performance and efficiency should be designed where possible to allow separate assessment of factors that are in the organisation's control;

- **effective** – the process should enable us to provide a robust estimate of relative efficiency and performance;

- **flexible** – the approach should be capable of responding to changes in the applicable regime such as future cost pressures, economic shocks, and changes in government policy;

- **measurable** – the monitoring and reporting requirements and associated metrics should be capable of independent measurement;

- **practical and cost-effective** – the approach should be realistic in scale and practical to implement;

- **targeted / proportionate** – the metrics should be limited to the most relevant areas and clearly defined; and

- **transparent** – the approach needs to be well-understood on all sides.

Refining and populating the framework

3.6 Figure 1 (on page 9) represents our long-term aspiration for what will be benchmarked and the comparators that Highways England will be benchmarked against. This is likely to evolve over time. For example, stakeholder engagement and the potential creation of benchmarking networks could significantly affect what activities are benchmarked, which comparators are used, and who carries out the analysis.

3.7 The framework is very broad, in terms of the areas to cover and the potential comparators. Given the timescales for developing RIS2, our shorter-term focus will be on areas and forms of benchmarking that are most likely to inform that process. This will be informed by our stakeholder engagement process and the extent to which we can tap into existing networks or obtain data of sufficient comparability and consistency.

Stakeholder engagement

3.8 It will be important for us to work and engage with a wide range of stakeholders to fulfil both our long-term aspirations and our shorter-term priorities. The following section describes in more detail the specific benchmarking activities we plan to undertake over the coming year, and stakeholder engagement will be important for all of those activities. We have identified three broad categories of stakeholders, with which we are planning to engage over the coming year:

■ domestic highway organisations – including devolved and local highway authorities, and representative organisations;

■ domestic infrastructure organisations in other sectors – including organisations such as the Cabinet Office and Infrastructure UK that look across sectors;

■ international road organisations – including NRAs in other countries, as well as representative organisations such as CEDR and the International Transport Forum / OECD.

3.9 Across all three groups, our short-term objectives will be to:

■ increase our understanding of previous benchmarking work, other organisations' plans for future benchmarking work and, more generally, how highway performance and efficiency are monitored in other organisations;

■ collect data on potential comparators to Highways England (particularly relating to the 'network characteristics' work described below); and

■ explore the potential to tap into existing benchmarking networks.

3.10 As discussed above, our longer-term aspiration is to establish a highways benchmarking network, potentially facilitated by a third party. Therefore, a significant focus of our stakeholder engagement will also be on identifying and beginning to establish links with organisations, particularly other NRAs that would be suitable comparators to Highways England and are similarly interested in developing benchmarking networks.

Keeping stakeholders updated on progress

3.11 It is clear that benchmarking a range of activities across a number of organisations is a complex task. As we move forward and understand more about the specific nature of the challenges and opportunities, we will update our plans. This document represents how we see things now and will be kept under review.

3.12 As our understanding develops we will give clarity to our stakeholders by publishing an annual update on our benchmarking work, with the first to be released before the end of 2016. In this update, we expect to provide greater certainty around the areas of benchmarking we will be able to cover in the short-term, to identify potential improvements in the first road period and inform the RIS2 development process.

4. Data collection and analysis

Network characteristics

4.1 Before undertaking more detailed and complex benchmarking analysis, we plan to collect a wide range of network characteristic data. This will allow analysis of simple comparative statistics and ratios (eg, vehicle kilometres per lane kilometre) to inform the selection of similar networks for more detailed benchmarking work. We will review the data sources highlighted in the scoping study to collate a dataset of network characteristics and carry out high-level comparative analysis.

4.2 However, many of the publicly available sources recommended in the scoping study relate to road networks as a whole, rather than nationally-managed roads similar to the strategic road network. Therefore, through our engagement with NRAs and other organisations, we will seek to augment this 'whole road network information' with data for nationally-managed roads. Precisely what will be included in the dataset will depend on what data are available but we envisage including measures describing:

- network size, eg total road or lane length, or length of the strategic road network as a proportion of the total network;

- network composition, eg splitting length by road type and covering the number or length of different structures or junctions;

- traffic, preferably by vehicle type, potentially including both motorised and non-motorised traffic;

- expenditure, at a high-level;

- performance or 'quality' measures, eg safety, user satisfaction, average delay etc.; and

- 'background' variables, eg covering demography, economy, geography, climate etc.

4.3 This initial analysis will help ensure comparability in our more detailed benchmarking work, by identifying other organisations and networks that are most similar to Highways England and the strategic road network. For Highways England, we plan to collect this data for the network as a whole and on a geographically disaggregated basis, for its regions and / or areas. This will facilitate simple comparative analysis of these operational units and support further internal benchmarking analysis.

4.4 We expect to complete the initial phases of this work, based on publicly available data for whole road networks in other countries and comparisons of Highways England's regions and / or areas, by summer 2016. We will undertake the data collection and analysis for networks similar to the strategic road network in the second half of the year and report on progress in our update by the end of the year.

Performance

Table 1 – Data availability for performance benchmarking

	Current KPI	Scoping study assessment of data availability	Data availability for internal HE benchmarking	Data availability for external benchmarking
Making the network safer	KSI casualties	✓✓✓	✓✓✓	✓✓✓
Improving user satisfaction	NRUSS results	✓✓	✓✓✓	✓✓
Supporting the smooth flow of traffic	Network availability	✓	✓✓✓	✓
	Incident clearance within 1hr			
Encouraging economic growth	Average delay	✓	✓✓	✓✓
Delivering better environmental outcomes	Noise important areas mitigated	✗	✓✓	✓
	Reduced biodiversity loss			
Helping vulnerable users on the network	New and upgraded crossing	✗	✓✓	✓
Keeping the network in good condition	Pavement in adequate condition	✓	✓✓✓	✓

	Key			
	✓✓✓	Data widely available	Reported on regional basis	Data widely available
	✓✓	Data available – comparability issues	Some processing required	Data available – comparability issues
	✓	Limited data availability	Significant processing required	Limited availability / alternative metrics
	✗	Data not currently available	Data not available	Data not available

4.5 The existing performance specification is a natural starting point for benchmarking Highways England's performance. It sets a range of key performance indicators (KPIs), performance indicators (PIs) and requirements in seven areas (excluding efficiency, which is discussed separately), against which Highways England routinely reports its performance.

4.6 Table 1 summarises the scoping study's assessment of data availability for performance benchmarking, alongside our own initial assessment of data availability for internal benchmarking (comparing Highways England's regions and / or areas) and external benchmarking (comparing Highways England against other organisations). Many of the indicators are very specific to Highways England.

Regular reporting of these indicators should make internal performance benchmarking possible across the complete set of indicators, but, as the scoping study highlighted, comparable information for other organisations is highly limited, or simply not currently available.

4.7   Based on the principles described in section 3, we plan to take a targeted / proportionate approach, focusing on areas where we are most likely to be able to develop consistent, measurable metrics. Therefore, in 2016-17 we plan to prioritise the following three areas for benchmarking operational performance against other organisations:

■   making the network safer;

■   improving user satisfaction; and

■   encouraging economic growth.

4.8   In the other areas we plan to focus on internal benchmarking at this stage of our programme. Our plan for each of the seven performance areas is discussed in more detail below.

4.9   Most regulated companies are subject to a set of requirements similar to Highways England's performance specification. Given this, we recently commissioned a study into approaches that are adopted across regulated sectors, which will feed into a number of our activities, including benchmarking (eg by potentially identifying metrics that could be benchmarked in the future that are not part of Highways England's current performance specification).

Making the network safer

4.10 Road safety is the area where the most international comparison work has already been done. For example, DfT produce statistics on international comparisons of road deaths, drawing from a wide range of sources including the OECD's International Road Traffic and Accident Database, the European Transport Safety Council, Eurostat and CARE, the EU's road accidents database.[4] These comparisons show that, under all of the commonly used metrics, the UK has one of the leading road safety records in the world. More detailed analysis of road accidents and casualties has also shown that travel on the strategic road network, and on motorways in particular, is, on average, safer than travel on other road types.

4.11 These statistics also highlight the challenge in benchmarking safety performance, as most international comparisons are for total road networks, rather than roads similar to the strategic road network, and fatalities, rather than KSIs (killed and seriously injured casualties), which form the basis of Highways England's KPI.

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[4] https://www.gov.uk/government/statistical-data-sets/ras52-international-comparisons

4.12 The work of the European Road Assessment Programme (EuroRAP) and its partners, which include Highways England and the Road Safety Foundation in England, will be a key source of data and information for our safety benchmarking. EuroRAP and its partners have undertaken mapping of both safety risk (measured by KSIs per hundred million vehicle kilometres) and safety star ratings (based on the physical road layout) of road networks across Europe, including the strategic road network in England. Furthermore, Highways England has set a target that, by the end of 2020, more than 90% of travel on the strategic road network will be on roads with a safety rating of EuroRAP 3-star (or equivalent).

4.13 The first stage of this work will focus on internal safety benchmarking on the strategic road network, and comparisons of safety risks and safety star ratings. We will work with Highways England to:

■ build on previous work comparing safety on different parts of the strategic road network to identify the potential reduction in KSIs if safety were improved on the least safe parts of the network;

■ investigate the links between EuroRAP safety star ratings and risk levels on the strategic road network at a route / road level; and

■ benchmark Highways England's 90% target, both against recent performance and targets in other countries.

4.14 We expect to complete the first stage of this before the end of the year, subject to completion of work to establish the safety star-rating baseline for the strategic road network. Subsequently, we will explore the potential to extend the analysis, to include similar networks in other countries, and expect to undertake that work in 2017-18.

4.15 Improving safety for those who work on the strategic road network is also part of making the network safer. Therefore we also plan to investigate the potential for benchmarking road worker safety over the coming year. This could take the form of cross-sectoral comparisons, for example based on standardised accident frequency rates, or, should comparable data be available from other organisations, comparisons against other highway authorities.

Improving user satisfaction

4.16 The scoping study recognised that, while road user satisfaction surveys in other countries are available, they are undertaken in a limited number of countries and there are significant issues in comparing their results. It identified the European Road User Survey (ERUS) as the best source of cross-country user satisfaction evidence, and the 'quality of roads' indicator in the World Economic Forum's Global Competitiveness Index (GCI) provides a possible alternative metric. However, there are issues with both of these metrics, including: the age of ERUS data (the survey was last undertaken in 2006); the degree to which the GCI indicator reflects user

satisfaction; and how to relate both metrics to Highways England's KPI in this area, which is based on the National Road Users' Satisfaction Survey (NRUSS).

4.17 Transport Focus also has a significant role in the area of road user satisfaction, including taking over running NRUSS from April 2016 and developing a new road user satisfaction survey. Transport Focus is currently developing its work plan for the coming year and it is important that we coordinate our work with its research plans. Over the coming year, we will:

- include regional comparisons of NRUSS scores in our wider internal benchmarking work;

- through our stakeholder engagement, develop our understanding of how user satisfaction is measured in other countries and collate relevant data (with links to the wider network characteristics data collection exercise); and

- work with Transport Focus to identify areas where benchmarking analysis would best complement its planned research.

4.18 We expect to provide more detail in our progress update at the end of 2016.

Encouraging economic growth

4.19 There are many ways of measuring a road network's impact on economic growth, as evidenced by Highways England's current set of indicators in this area around speeds, delay and journey time reliability. This creates a challenge in identifying comparable measures for other networks. The most promising source of existing evidence is from the European Commission's 2012 report: '*Measuring Road Congestion*'[5]. While this work has the advantage of applying a common method across countries, as with the safety and satisfaction areas, the data are becoming old and the analysis was not specific to roads similar to the strategic road network.

4.20 We will explore with Highways England how we can use more geographically disaggregated breakdowns of its congestion and delay indicators in our network characteristics work, and in our benchmarking analysis of other areas. Through our stakeholder engagement and collection of network characteristics data for a wider set of nationally-managed networks, we will investigate whether similar speed / delay / reliability indicators are being developed by other NRAs.

Supporting the smooth flow of traffic

4.21 The scoping study concluded there are limited comparable data available for Highways England's network availability KPI. However, this conclusion related to the development of common speed / delay / reliability indicators with satnav-type data as discussed above under the encouraging economic growth area. Under the incident

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[5] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC69961/congestion%20report%20final.pdf

clearance KPI, there are a limited number of authorities reporting similar metrics. Overall there does not appear to be much readily available data for benchmarking in this area. Therefore, while we will explore data availability through our engagement with other organisations and NRAs, we expect our work in this area to focus on internal benchmarking of Highways England's regions or areas.

Delivering better environmental outcomes

4.22 The current KPIs in this area, introducing mitigations in Noise Important Areas and reducing net biodiversity loss, are very specific to Highways England and equivalent data are not available for other NRAs. There is greater potential to benchmark metrics for factors such as greenhouse gas emissions or air quality. However, there is a requirement in Highways England's performance specification for it to develop new or improved indicators covering biodiversity and greenhouse gas emissions. Therefore, in the short-term, and while Highways England is developing these indicators, our focus in this area will be on investigating the potential for benchmarking alternative metrics, through our stakeholder engagement and wider network characteristic data collection exercises.

Helping vulnerable users of the network

4.23 Similarly to the environmental area, the KPI for delivering new and upgraded crossings for vulnerable users is very specific to Highways England and comparable data for other organisations are unlikely to be available. However, there is a wealth of data available on road safety and, as part of the benchmarking of casualty rates, we also plan to benchmark casualty rates for vulnerable users, both across the strategic road network and on equivalent networks elsewhere.

Keeping the network in good condition

4.24 Highways England's current KPI in this area relates to the percentage of pavement (road surface) that does not require further investigation for possible maintenance. Given the breadth of assets making up the strategic road network, this is a fairly restricted metric and there is also a requirement in the performance specification for Highways England to improve its asset information quality and develop new indicators. As part of this process we would expect Highways England to investigate processes and indicators that are used to manage similar networks and assets elsewhere in the world, and that this might yield potential benchmarking information. However, given that new indicators are to be developed over the next few years, we are not planning to prioritise this area for benchmarking in the short-term.

Efficiency

4.25 As set out in section 3, our efficiency benchmarking of Highways England will cover a range of expenditure areas, including services and processes that support the operation, maintenance and enhancement of the strategic road network. We see our work in this area progressing along two workstreams:

■ 'network management costs' – covering maintenance, renewal, enhancement, operations and customer-facing activities; and

■ 'support services and processes' – covering costs of estates and 'back-office' functions such as finance, HR, and IT, as well as processes used in areas such as procurement, asset management and programme and project management.

Costs

4.26 Our long-term aspiration is for the creation of a database of costs and network characteristics, potentially through a benchmarking network that could be facilitated by a third party, for both top-down and bottom-up benchmarking of Highways England against other highway authorities. As discussed above, in the short-term, we will focus on areas of the framework that are most likely to inform the efficiency review and development of RIS2.

Top-down internal cost benchmarking

4.27 To produce meaningful, robust results, top-down benchmarking requires panel data, datasets that cover multiple organisations (or organisational units) over a period of time, with consistent definitions of cost categories and other variables, between organisations (or units) and over time. Top-down methods can be applied to total expenditure; spending areas, such as 'maintenance'; or even more disaggregated spending lines or activities, such as 'winter services' (as was done in the analysis carried out by the CQC Efficiency Network that was highlighted in the scoping study).

4.28 The more disaggregated top-down analysis becomes, the greater the risk of data inconsistency (e.g. because of differing definitions or classifications across organisations) and that too much emphasis could be placed on low spending in one area appearing 'efficient' when in reality it leads to higher costs in other areas. Benchmarking total expenditure, or 'totex', can address both of these issues but carries the disadvantages of providing less specific information on where efficiency can be improved and having to address the 'lumpiness' that can come in investment (and policy) cycles.

4.29 In the longer-term, through engagement with other NRAs and organisations that have previously undertaken international highways benchmarking studies, we plan to support the development of a benchmarking network to collate that data; and to begin collating the data required for international top-down benchmarking.

4.30 In the shorter-term we will undertake internal top-down benchmarking of Highways England's operational units (ie regions or areas). Highways England is already reporting regional expenditure breakdowns. So, whilst additional historical data will be required, beginning with internal benchmarking will provide greater control over data collection and consistency and, therefore, increase the likelihood of the analysis being able to inform the efficiency review and RIS2 development. Within this analysis we will investigate benchmarking regional expenditure for more disaggregated spending lines, like 'maintenance' or 'operations', and at different levels of aggregation.

Real unit operating expenditure

4.31 Real unit operating expenditure (RUOE) analysis is a simpler form of top-down benchmarking that focuses on changes in productivity and costs over time and allows comparisons to be made across sectors. The approach looks at operating expenditure (rather than capital expenditure), requires an 'output measure' for each sector and as consistent as possible a definition of operating expenditure across sectors. Previous RUOE analysis looking at the water and power sectors used customer numbers and measures of electricity or gas demand as the 'output measures',[6] so measures of network length and / or traffic would likely be most applicable for the highways sector.

4.32 Alongside the internal top-down benchmarking of Highways England's regions or areas we plan to undertake RUOE analysis, which will:

■ compare recent trends in Highways England's operating costs and productivity against other sectors; and

■ provide insight on the operating expenditure efficiencies achieved in other sectors when those sectors were at a similar level of 'maturity' to Highways England – ie based on efficiencies achieved in other sectors, what level of efficiency improvements could be expected during the second road period.

Bottom-up cost benchmarking

4.33 The top-down approaches discussed above combine the costs and volumes of work across many different activities. By contrast, bottom-up benchmarking methods focus on specific activities, for example comparing the costs or amount of labour required to complete a given task.

4.34 Our long-term aspiration is to establish a comprehensive dataset of unit costs and similar metrics covering a wide set of comparators, potentially through a benchmarking network facilitated by a third party. The scoping study reviewed the

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[6] For example, see '*Scope for improvement in the efficiency of Network Rail's expenditure on support and operations: supplementary analysis of productivity and unit cost change*', CEPA (2012) http://orr.gov.uk/__data/assets/pdf_file/0013/517/cepa-orr-om-productivity-over-cp5.pdf

availability of the data required for bottom-up cost benchmarking across a range of potential activities. Table 2 presents the study's conclusions and highlights the scale of the challenge in meeting this long-term aspiration, as there is very little readily available data.

Table 2 – Scoping study assessment of data availability for bottom-up cost benchmarking

Category	Variables	Metrics	Data availability
Routine and cyclical maintenance	Grass cutting, bulk lamp changes, cleaning, safety fencing repair, patching	£/km, £/lighting column, £/km, £/km, £/lane km.	❌
Reactive maintenance	Filter drain replacement, soft estate management, cleaning gullies, pothole repair, white line refreshing, safety fencing repair	£/km, £/area, £/km, £/pothole, £/lane km, £/km.	❌
Renewal	Carriageway resurfacing, carriageway replacement, waterproof replacement, parapet replacement, bridge joint replacement, electronic traffic equipment	£/lane km, £/lane km, £/structure, £/structure, £/structure, £/lane km.	✔
Operating expenditure	Network control centres, precautionary treatments, energy costs	£/km, £/lane km, £/km.	✔
Customer-facing activities	Traffic officer service	£/km	✔
Network enhancements	Constructing new roads, widening existing roads, new smart motorways, junction improvements	£/lane km, £/lane km, £/lane km, £/scheme.	✔✔

Key			
✔✔ Data readily available	✔✔ Data will be available	✔ Data should be available	❌ Data not / unlikely to be available

4.35 Therefore, over the coming year, we will:

■ finalise the specifics of our data and information requirements and identify any enhancements that need to be made to the information we already receive from Highways England;

■ work with Highways England, through its Coordinated Data Improvement Plan, to improve the quality of its unit cost data; and

■ engage with stakeholders to explore the potential to:

– tap into existing networks; and

– establish new benchmarking networks.

Support services and processes

4.36 Efficiency benchmarking covers Highways England's support services and processes as well as the more direct costs of building, maintaining and operating the strategic road network. There is a wide range of different support functions that could be benchmarked and, because they are common across a wide range of businesses or sectors, there are also many potential comparators. In the longer-term, we plan to support the development of benchmarking networks of highways authorities in the UK and overseas that share data and carry out benchmarking analysis in these areas.

4.37 Even with a network of NRAs, there would still be benefit in benchmarking Highways England's support costs against a wider set of comparators in other sectors. Given the timescales involved in setting up such a network, we see comparisons with other sectors as the starting point in the short-term. There are also organisations that offer 'off-the-shelf' benchmarking services, eliminating the need to collect data from a wide range of organisations. Another advantage of these benchmarking services is that they have established approaches to measuring both the costs and effectiveness of support functions, ensuring that efficiency is not simply assumed to mean lower cost.

4.38 Our priority in this area over the next year is to work with Highways England to:

■ understand better what benchmarking work it has already undertaken;

■ prioritise support functions for further benchmarking analysis; and

■ identify organisations that offer 'off-the-shelf' benchmarking services.

4.39 Especially given the proportion of Highways England's expenditure that passes through third-party contractors in its supply chain, the processes by which Highways England manages its assets, programmes, projects, contracts and procurement exercises are also critical to its efficiency. Before benchmarking these processes against other organisations, we are considering undertaking capability reviews in the following areas:

■ asset management;

■ procurement and supply chain management; and

■ project and programme management.

4.40 These capability reviews would be undertaken by, or in collaboration with, Highways England. While they might include some consideration of 'best practice' in each area, they would not involve direct benchmarking against specific comparator organisations. Rather, the reviews would provide a baseline view of Highways England's capability in each area, to develop a shared understanding of the potential key enablers of future efficiency improvements and to highlight where benchmarking could add most value in quantifying those potential efficiency improvements.

5. Assessing the economic impacts of the strategic road network

5.1   One of the key themes from the evidence reviewed in the scoping study was that, when considering the efficiency of Highways England's activities, and the strategic road network in general, it is important to consider the benefits as well as the costs. The scoping study highlighted two ways in which these benefits could be measured:

  ■   undertaking an economic impact study of the strategic road network, to measure its economic contribution; and

  ■   developing a cost-benefit analysis model to assess the value for money of different levels of investment in road maintenance.

The economic contribution of the strategic road network

5.2   As discussed in the performance part of section 4, there are many different ways the economic impact of the strategic road network could be measured, and Highways England's current PIs in this area focus on speeds, delays and reliability. Where these metrics focus on trying to minimise the 'costs' that come with congestion, alternative metrics could be developed, through economic impact studies, that measure the economic contribution of the strategic road network.

5.3   Studies of this sort have been undertaken in other countries[7], and in the UK for other sectors[8]. However, these studies highlight the challenges associated with analysis of this sort, particularly around constructing a realistic counterfactual (the strategic road network is an integral part of our transport system and economy, so removing it would doubtless have significant, and likely catastrophic, effects) and deciding how wide to 'cast the net' when considering which impacts, be they gross value added or employment-based, should be attributed to the strategic road network.

5.4   These analytical challenges would be surmountable but are such that meaningful benchmarking, either over time or with similar networks in other countries, would also be highly challenging. Differences in economic impact across countries, and changes over time, would likely be more influenced by differences in methodology or the wider economy, than by factors that are more within Highways England's control. Therefore, we do not believe that undertaking an economic impact study to provide an alternative indicator of the economic performance of the strategic road network

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[7] The scoping study cited the value-added indicator developed by ANAS, the Italian NRA.

[8] For example, '*What is the contribution of rail to the UK economy?*', Oxera (2014): http://www.oxera.com/Latest-Thinking/Publications/Reports/2014/What-is-the-contribution-of-rail-to-the-UK-economy.aspx.

would meet the criteria set out earlier in section 3, and we are not planning to take forward any work in this area.

The long-term benefits of investment in road maintenance

5.5   A cost-benefit analysis model for maintenance on the strategic road network would allow comparison of the costs and benefits of different levels of maintenance investment, and potentially the identification of the 'optimal' level of maintenance (given a large number of assumptions). Similar models already exist, such as the Highway Development and Management (HDM) models developed initially by the World Bank[9] and the Highways Maintenance Appraisal Tool (HMAT) model recently developed by DfT to assess investment levels on local road networks[10], and it would likely be feasible to build on or adapt these models for the strategic road network.

5.6   As discussed towards the end of section 4, we are currently considering undertaking a review, in collaboration with Highways England, of its asset management capability. A cost-benefit analysis model of this sort would likely be a useful complement to Highways England's existing processes and a useful tool in determining levels of maintenance required in future Road Periods.

5.7   Developing a model of this sort would be a significant undertaking, given the amount of data and number of assumptions required. Following the asset management capability review, we will consider, along with our stakeholders, whether there would be value in developing a strategic road network-specific maintenance cost-benefit analysis model, and where responsibility for its development would best sit. However, we are not planning any work to develop a model of this sort in the short-term.

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[9]
http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTROADSHIGHWAYS/0,,contentMDK:22011461~pagePK:148956~piPK:216618~theSitePK:338661,00.html

[10] https://www.gov.uk/government/publications/local-highways-maintenance-economic-costs-and-benefits-tool

6. Summarising our benchmarking plan

6.1 The ultimate objective of our benchmarking work is to drive improvements in performance and efficiency that lead to better outcomes for users of the strategic road network and a more efficient cost to its funders. Both our long-term aspiration and our priorities in the short-term are based around this objective of identifying areas where Highways England can make real improvements in its performance and efficiency.

Longer-term aspiration

6.2 We aspire to develop a benchmarking network of highway authorities, potentially including other UK authorities and NRAs from other countries, who share comparable and consistent data and information on network characteristics, costs, processes and performance suitable for detailed top-down and bottom-up benchmarking.

6.3 We recognise that this is ambitious; benchmarking networks in other sectors have typically taken several years to set up and have started with a relatively small core group of organisations. However, our benchmarking work will not end with RIS2 and it is important that we start making contacts and attempting to build these networks now, even if the return from these activities might only be fully realised for the third Road Period and beyond.

Shorter-term priorities

6.4 Given the long timescales and significant challenges involved in setting up wider benchmarking networks, our shorter-term priorities focus on internal benchmarking of Highways England's operating units. This internal analysis is more likely to identify potential improvements that could be implemented in the first road period and to inform the development of RIS2. If the required data and information are available, the analysis could also be extended to include other domestic highway authorities.

6.5 Over the next 12 months we plan to:

- capture **datasets of network characteristics**, covering a variety of countries' whole road networks and roads more equivalent to the strategic road network, ensuring the comparability of these datasets, and perform simple comparative analysis of the data;

- carry out **internal benchmarking of Highways England's regions and areas** across its performance specification and, through our stakeholder engagement, explore the potential for wider benchmarking against other highway authorities;

- begin more detailed **benchmarking of safety** across the strategic road network, including analysis of the links between safety risks and star-ratings, comparisons with similar networks elsewhere, and road worker safety;

- work with Transport Focus to consider **benchmarking of user satisfaction**;

- perform **cost benchmarking** of Highways England's operating units (regions or areas), and **real unit operating expenditure** analysis comparing trends in Highways England's productivity with other sectors;

- work with Highways England to develop the quality of its unit cost data and how Highways England will go about **benchmarking the costs and effectiveness of its support functions**; and

- investigate the **potential for bottom-up cost benchmarking** through existing networks.

6.6 Many of these projects rely on us obtaining sufficiently robust data, and, for some of the projects, Highways England being able to produce and provide that data. If the required data are not available, or if alternative data sources become available, we will consider alternatives and re-prioritise our plans. We intend to publish a report before the end of 2016, updating on progress with these projects, changes to our plan, and the reasons for those changes. We will also actively engage with our stakeholders at appropriate points to ensure that our work is as informed as possible.
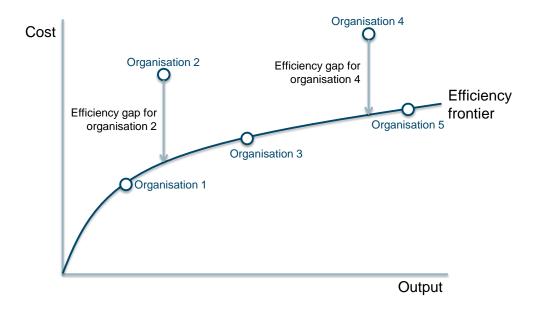
Annex A – Glossary

Benchmarking – Comparing across organisations (or organisational units) to identify best practice and drive improvements in performance and efficiency.

Bottom-up benchmarking – Bottom-up approaches focus on identifying improvements in efficiency for specific activities based on known technologies or working methods. As such, bottom-up methods can produce more specific detail on where efficiency improvements can be achieved. However, bottom-up estimates for efficiency improvements can be conservative as they are based entirely on current practice (which might improve over time).

Catch-up – The potential for performance and efficiency improvements by closing the gap on leading organisations, for example by adopting best practice.

Efficiency – The relationship between inputs and outputs. For example, delivering the same level of output, to the same level of quality, with fewer inputs would represent an efficiency improvement.

Efficiency frontier – The combination of inputs and outputs that represents the most efficient organisation(s) in a sector or industry. Many of the analytical techniques used in regulatory benchmarking are concerned with estimating the efficiency frontier and the 'efficiency gap' for firms not on the frontier (see diagram below).

Efficiency review – One of the steps in the development of a new road investment strategy, our efficiency review will provide advice on whether proposed requirements are deliverable within the proposed financial resources, and the extent to which Highways England's draft strategic business plan is challenging and deliverable.

External benchmarking – Comparison across organisations, rather than within an organisation.

Frontier-shift – Improvements in the performance and efficiency of leading organisations over time, for example as a result of technological improvements.

Internal benchmarking – Comparison of parts of or operating units within an organisation. In the context of Highways England, this could mean benchmarking performance and efficiency across its regions and / or areas.

Performance / Effectiveness – The extent to which stated objectives are achieved.

Process benchmarking – Comparison of key processes that support an organisation's activities, rather than the direct costs of those activities. In a highways context this might include processes for asset management, procurement, or programme and project management. Assessing an organisation's processes or 'maturity' in these areas against established standards or maturity models can help with comparisons across different organisations.[11]

Real unit operating expenditure – This method provides a high-level comparison of efficiency trends over time, including across sectors. Operating expenditure is expressed as a unit cost by dividing by a relevant 'output measure' for each sector included in the analysis. Therefore, while direct comparison of the levels of unit costs would only be possible for organisations in the same sector, changes in unit costs over time can be compared across sectors as well.

Road investment strategy – The road investment strategy sets out the government's long-term strategic vision for the strategic road network. It includes its investments and performance priorities for the relevant road period.

Road period – The period covered by a road investment strategy. The first road period runs from 2015 to 2020 and the second will cover a period from 2020.

Strategic road network – The strategic road network is made up of the motorways and major trunk roads (both single and dual carriageway 'A' roads) managed by Highways England.

Support / back-office costs – The costs of functions that support, but do not directly relate to, the organisation's core activities. This could include finance, human resources, information systems / technology, legal etc. When benchmarking these areas it is necessary to consider the effectiveness of the support functions, as well as levels of expenditure / efficiency.

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[11] For example ISO 55000 for Asset Management or P3M3, the Portfolio, Programme and Project Management Maturity Model.

Top-down benchmarking – A form of benchmarking that uses statistical (or econometric) techniques to identify the key drivers of expenditure and analyse trends over time. As such, top-down techniques look across the costs and volumes of many different activities and can be applied to total expenditure (see below) or more disaggregated spending lines. They are particularly useful for identifying leading organisations and the overall scope for potential efficiency improvements.

Total expenditure (totex) benchmarking – A form of top-down analysis increasingly used in other regulated sectors. Capital (capex) and operating (opex) expenditure are analysed jointly as total expenditure – totex. A key advantage of this is that it reduces the incentives for companies to substitute between capex and opex in a potentially inefficient manner.

Annex B – Scoping study recommendations

The scoping study report[12] contained 20 recommendations for how the Highways Monitor could develop its approach to benchmarking Highways England. While these were presented as short, medium and long-term, they could equally have been grouped into four categories or themes:

■   developing the benchmarking framework;

■   stakeholder engagement;

■   data collection and analysis; and

■   assessing the economic (and social) impacts of the strategic road network and Highways England's activities.

This annex provides a brief summary of the recommendations in these four areas.

Developing the benchmarking framework

The first recommendation in the scoping study was to 'develop a theoretical framework', focusing on the network characteristics and performance indicators that would be important in benchmarking the efficiency and performance of road networks and NRAs.

Identifying the key variables of interest only forms part of developing a benchmarking framework; it is also important to consider the sorts of analysis that will be employed and the comparators that will be used to benchmark against. The scoping study recommended that we should consider the roles of:

■   top-down benchmarking - including whether this could be international, intra-regional or compared against local highway authorities (recommendations 5-8);

■   intra-industry comparisons - building on reports produced by the Cabinet Office on construction and back office costs, and regulatory analysis of frontier shift and staff and pension costs (recommendations 10 and 17); and

■   in the longer-term, bottom-up analysis focusing on activities and functions most material to Highways England's efficiency and performance (recommendation 16).

Stakeholder engagement

The success of a benchmarking exercise is likely to be highly reliant on obtaining good quality, consistent data across a set of comparable organisations. Engagement will form a key part of our benchmarking plan to learn lessons from previous highways benchmarking

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[12] http://orr.gov.uk/__data/assets/pdf_file/0015/20805/kpmg-benchmarking-highways-england-february-2016.pdf

exercises and to obtain more relevant and consistent data than may be publicly available. The scoping study recommended engaging with:

- organisations that have relatively recently undertaken highways benchmarking exercises, including CEDR, OECD and the HMEP / CQC network (recommendation 3);

- other highway authorities, in the UK, Europe and further afield (recommendations 9, 11 and 12); and

- EuroRAP to understand the role that cross-country safety data could play (recommendation 15).

Following engagement with this wide range of bodies, the scoping study recommended that we should consider developing an independent benchmarking group (recommendation 4).

Data collection and analysis

The scoping study highlighted a number of datasets that we should obtain to carry out initial, high-level analysis (recommendation 2). This included:

- International Road Federation - World Road Statistics

- OECD / ITF - Road Infrastructure Spending database

- EU Road Federation - European Road Statistics

- World Bank - Road statistics online database

- United Nations Economic Commission for Europe (UNECE) statistical database

- CEDR's BEXPRAC study and TEN-T performance reports

- National Road Authorities' annual reports

- Eurostat's road transport database

- DfT - Road safety, congestion, reliability and traffic statistics

- DCLG - Local authority revenue and capital expenditure budgets

- DBFO/PPP contract data

- Cabinet Office benchmarking of back-office functions

- HM Treasury Infrastructure Cost Review

A large focus of the engagement process recommended above would be to obtain data for a set of comparable NRAs. In addition, the scoping study recommended that we should obtain data on local authority highway characteristics, performance and expenditure (recommendation 13) and from UK DBFO / PPP contracts (recommendation 14) and, in

the longer-term, investigate the potential to develop inter-network performance indicators using emerging big data sources, such as satnav-based traffic data (recommendation 20).

Assessing the economic (and social) impacts of the strategic road network and Highways England's activities

Two of the longer-term recommendations related to potential areas of work that focus more on the benefits of Highways England's activities, to complement the more traditional benchmarking approaches:

■ considering the development of the HDM-4 model, or similar, to assess the economic benefits of different levels of maintenance activity, and associated expenditure (recommendation 18); and

■ considering how the wider economic contribution of the strategic road network could be assessed, for example through an economic impact study, to act as an alternative performance indicator (recommendation 19).