



Benchmarking Highways England

2018 Progress Report

31 January 2019

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Executive Summary

Benchmarking Highways England's performance and efficiency is an important element of our role. It helps us monitor Highways England's delivery of the Road Investment Strategy; will inform our advice on future strategies; and increases transparency around Highways England's performance.

We have been collecting consistent regional performance and spending data for three years and can now begin to see trends and patterns. Differences in performance across regions are generally relatively small. The main exception to this is average delay, where there are bigger differences between regions.

Where there are regional differences in performance, we have seen evidence of Highways England taking action to address the issue. For example, it has improved incident clearance in what were the worst performing regions. And, while satisfaction is considerably lower in the North West than elsewhere, Highways England is implementing plans aimed at improving user satisfaction in the region.

Highways England's average maintenance costs per lane mile, and the differences in maintenance spending between regions, both increased in 2017-18. On its own, this does not necessarily indicate falling efficiency. A fuller understanding of what is happening with Highways England's maintenance efficiency requires good top-down and bottom-up evidence.

We are working with Highways England to develop more detailed data and analysis to improve its understanding of its maintenance costs and efficiency. This forms part of Highways England's own programme of benchmarking work. It is also developing its own programme of regional operational benchmarking and has completed a benchmarking exercise of its corporate services.

Over the last year, we have looked in detail at Highways England's pavement condition and incident clearance key performance indicators, comparing its approach with other road operators. In both areas, Highways England's processes compare well with others. But there are limited opportunities for direct benchmarking of outcomes as different road operators tend to use different indicators or metrics to monitor performance.

We expect evidence from both of our benchmarking programmes to inform Highways England's plans for the second road period that we will be reviewing in our Efficiency Review in 2019. This will be a significant focus of our work next year. We also plan to build on our work on pavement condition, looking at the feasibility of directly comparing the condition of roads across networks. And to continue our longer-term work with Highways England to establish wider comparators for benchmarking its efficiency.

Introduction

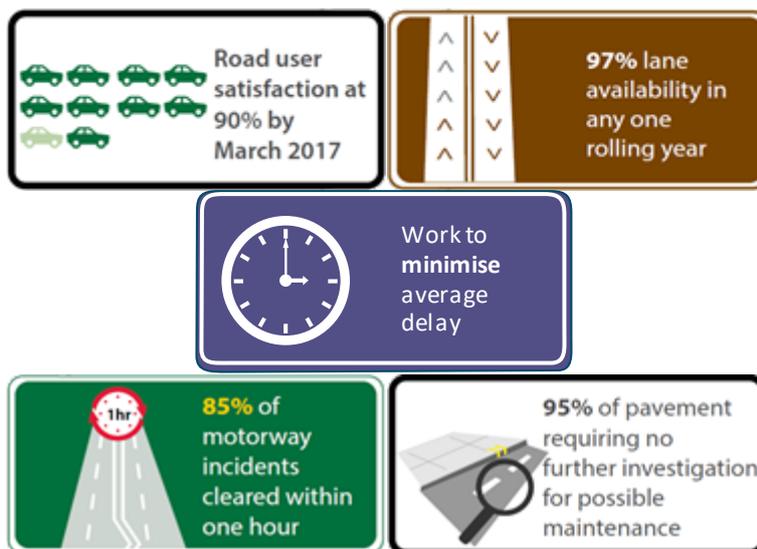
1. This is the third in our series of annual progress reports on our work benchmarking Highways England. This work is important for a number of reasons. Our benchmarking work:
 - will form part of our evidence when we review Highways England's plans for the second road period;
 - can identify improvements that Highways England can implement to deliver better outcomes for the strategic road network's (SRN's) users and funders; and
 - improves the transparency around Highways England's performance and how this varies across the SRN.
2. We now have three years of consistent regional performance and spending data. This means we can begin to see trends and patterns. But we expect the value of this analysis to increase over time as a longer time-series gives us greater insight.
3. We have continued to explore opportunities to benchmark Highways England's processes and performance in certain areas against other countries and sectors. It is important for us to work with colleagues in Highways England on these projects, as they are in the position to deliver improvements that benefit road users. Alongside this report we have published two such studies, looking at how pavement (road surface) condition is measured and how incidents and unplanned disruption are managed.
4. Highways England is also leading its own benchmarking work. It is developing a programme of regional operational benchmarking; collecting a more detailed dataset of maintenance spending in its areas; and has completed a benchmarking exercise of its corporate services.
5. We expect evidence from both of our benchmarking programmes to inform Highways England's plans for the second road period that we will be reviewing in our Efficiency Review in 2019.

Regional comparisons

Regional performance against key performance indicators

6. In this section we show how Highways England's performance against a subset of its key performance indicators (KPIs) varied across its regions in 2017-18. Figure 1 shows the five KPIs included in this analysis.

Figure 1 Key performance indicators and targets included in the regional comparisons

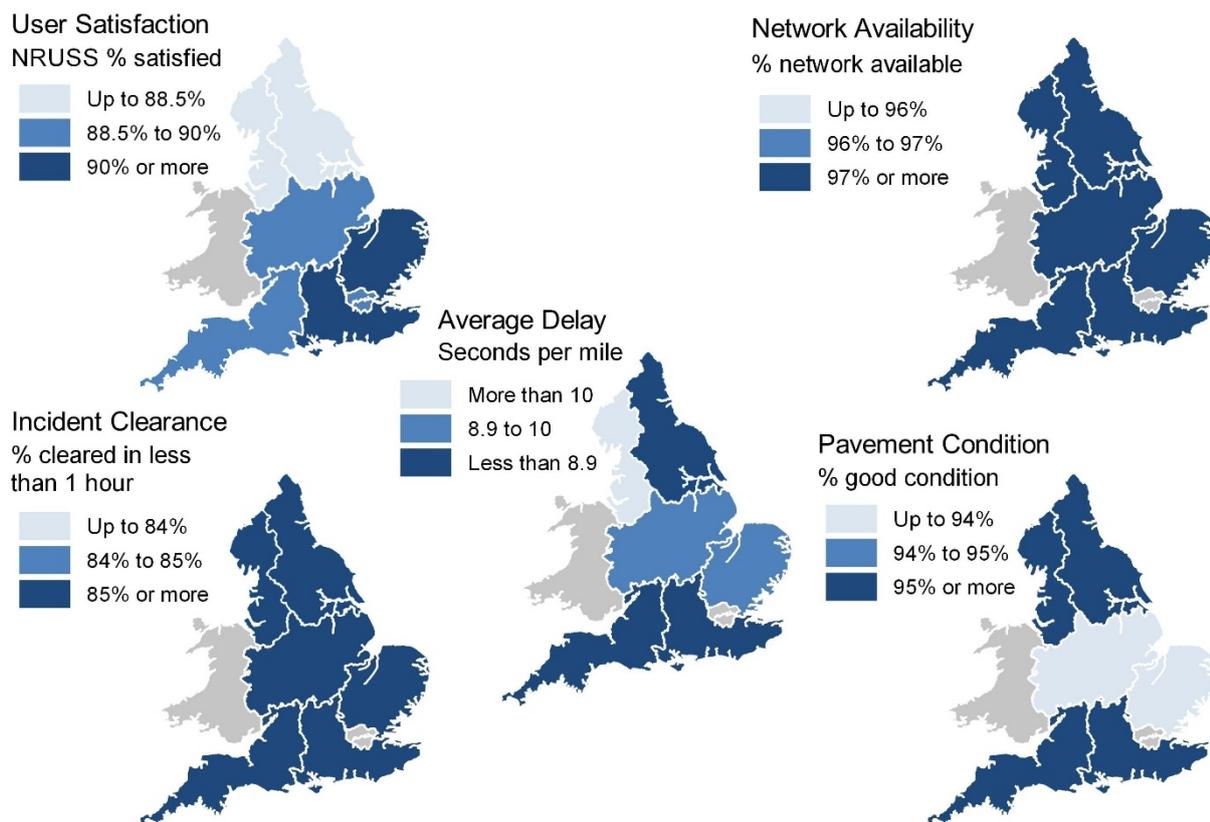


7. The maps in figure 2 show how performance against these five KPIs varied in 2017-18. The colour-coding is based around Highways England's national targets for these KPIs as there are no regional targets. So it is expected that there might be some regional variation as Highways England delivers against its national targets.

8. The differences between regions are generally relatively small and reflect Highways England's national performance. This is particularly the case for network availability and incident clearance, with all regions exceeding the national target. There are two main exceptions:

- average delay, where there is generally more variation across the regions; and
- user satisfaction, where the North West was an outlier from the other regions in 2017-18.

Figure 2 Highways England regional KPI performance, 2017-18

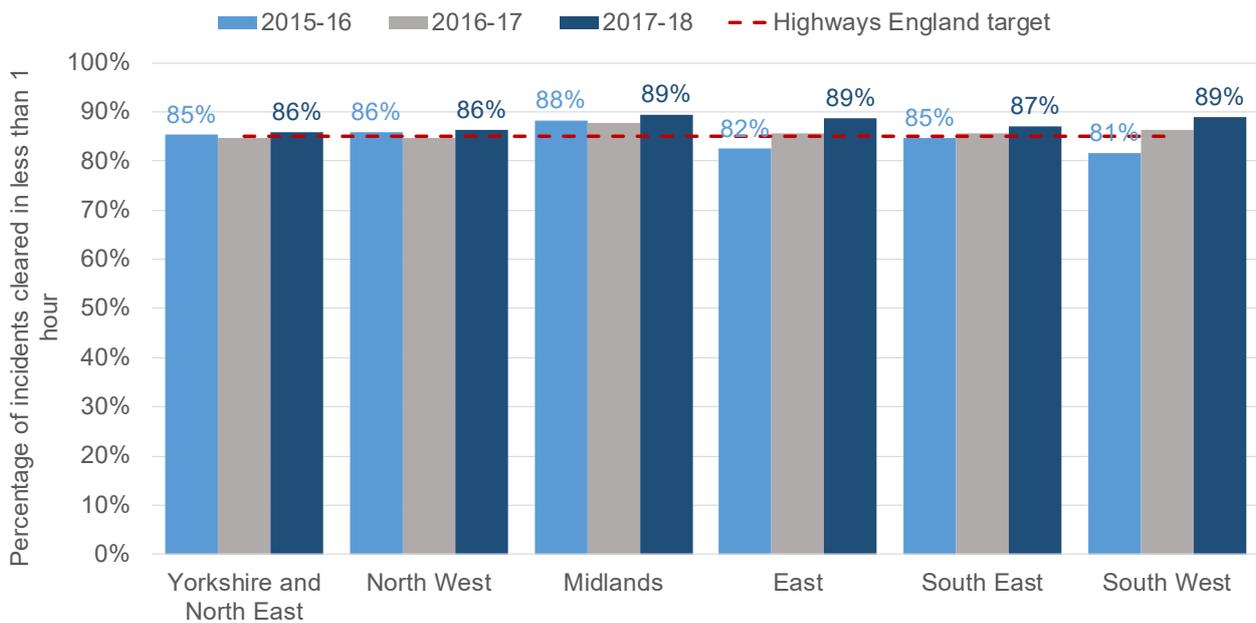


Network availability and incident clearance

9. Every region has exceeded the target to keep at least 97% of the network available for traffic in each of the first three years of the road period. By contrast, figure 3 shows that the percentage of incidents cleared in less than an hour was below the national target of 85% in the East and South West in the first year of the road period. But they are now two of the top performing regions in this area, and this has helped drive stronger performance at the national level.

10. The next section of this report includes a summary of a project that looked at how Highways England manages incidents and unplanned disruption. In that section, we discuss in more detail some of the actions that Highways England has taken to improve performance in this area.

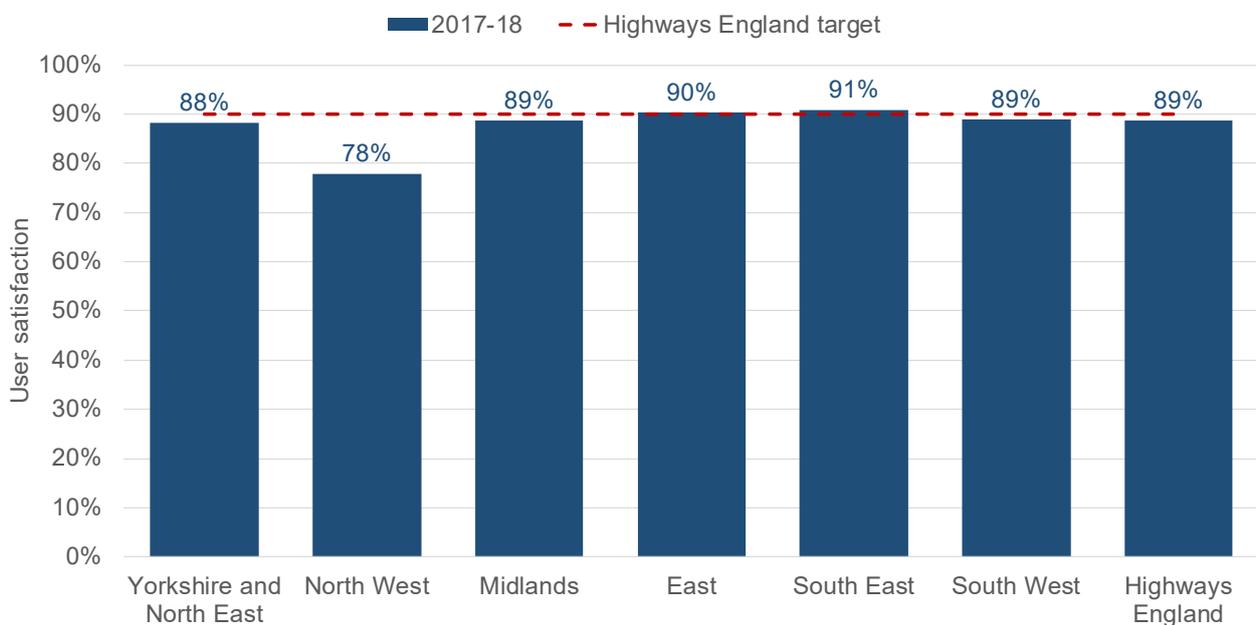
Figure 3 Regional incident clearance performance, 2015-16 to 2017-18



User satisfaction

11. There is more regional variation in the other three KPIs. User satisfaction in most regions in 2017-18 was at, or relatively close to, the national target of 90%. But it was substantially lower in the North West, at 78%.

Figure 4 Regional user satisfaction in 2017-18



12. It is difficult to identify drivers of satisfaction from the National Road Users’ Satisfaction Survey (NRUSS), particularly at a regional level. But Highways England identified the following factors as contributing to lower satisfaction in the North West:

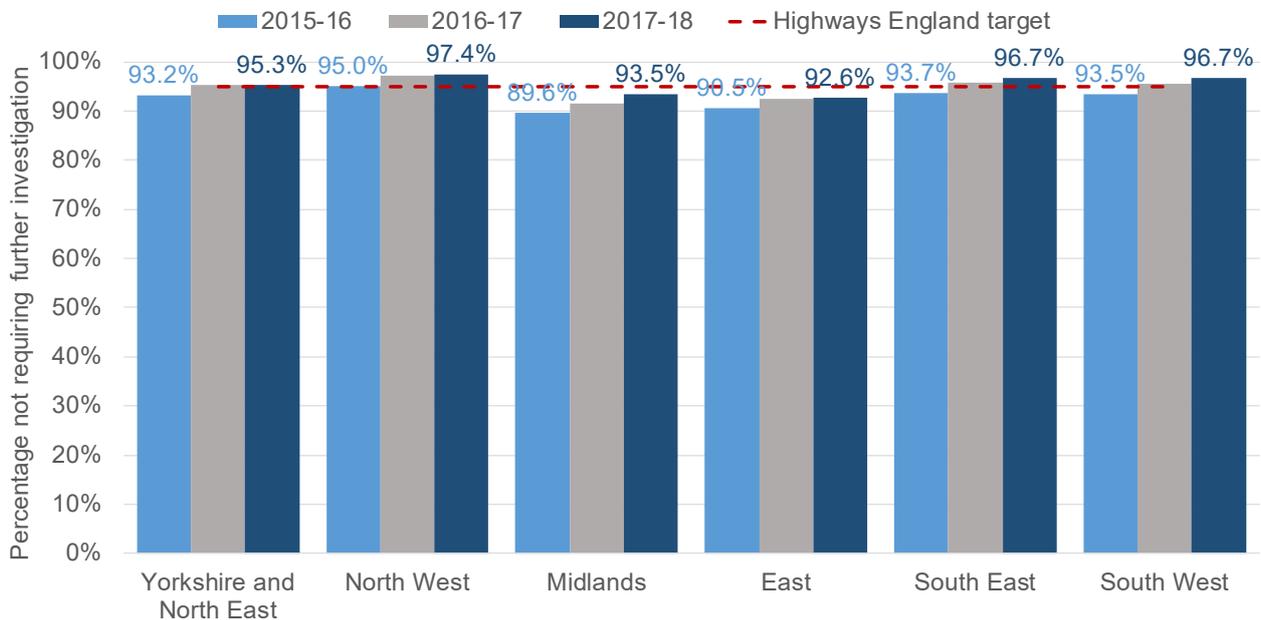
- a high concentration of, and delays to, major schemes;
- above average levels of commuters (who tend to be less satisfied); and
- fewer variable message signs.

13. Highways England is implementing plans aimed at improving user satisfaction in this region. And we have seen evidence from mid-year NRUSS results and the new Strategic Roads User Survey (SRUS) that the gap in user satisfaction is narrowing in 2018-19.

Pavement condition

14. 2017-18 was the first year that Highways England met the national target for its pavement (road surface) condition KPI. Figure 5 shows the regional breakdown of this KPI from 2015-16 to 2017-18, highlighting changes between the first and third years of the road period. Pavement condition has improved in all regions and differences between them are relatively small. But, pavement condition was below the national target in the East and Midlands in 2017-18. As noted above, we might expect this sort of regional variation when Highways England is delivering against national targets.

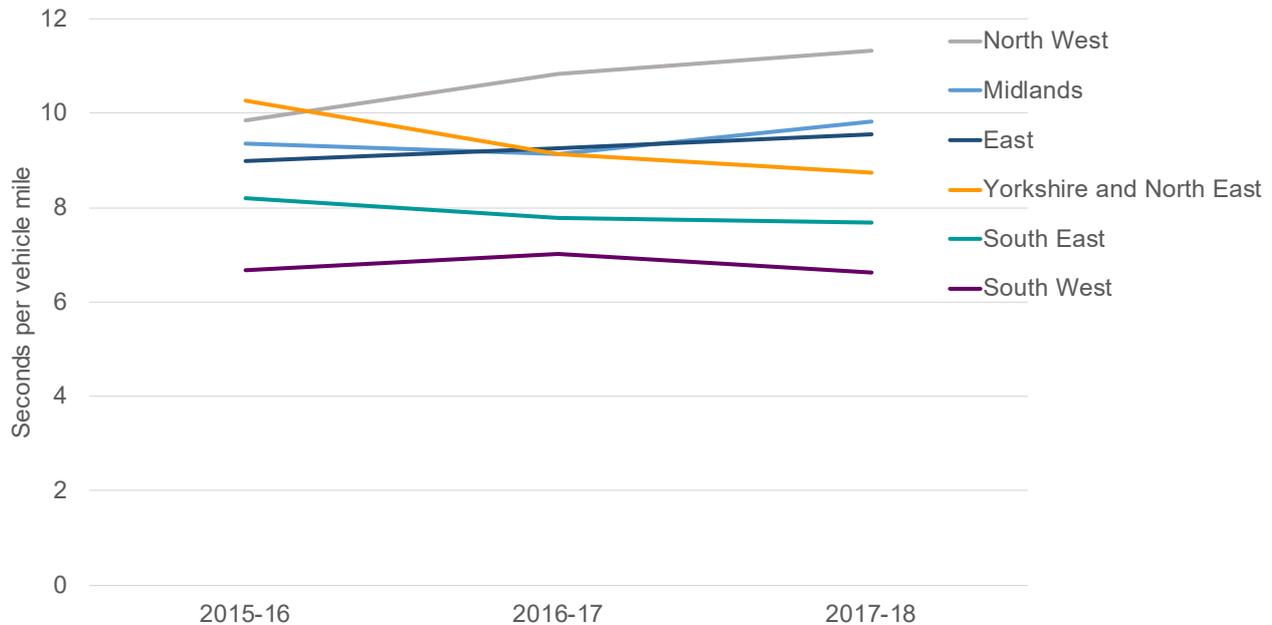
Figure 5 Regional pavement condition, 2015-16 to 2017-18



Average delay

15. With three years of data we can begin to see trends in regional average delay levels, as well as the simple differences between regions. Figure 6 shows a mixed picture, with delays appearing to increase in three of Highways England's regions, and falling in the other three.

Figure 6 Regional average delay, 2015-16 to 2017-18



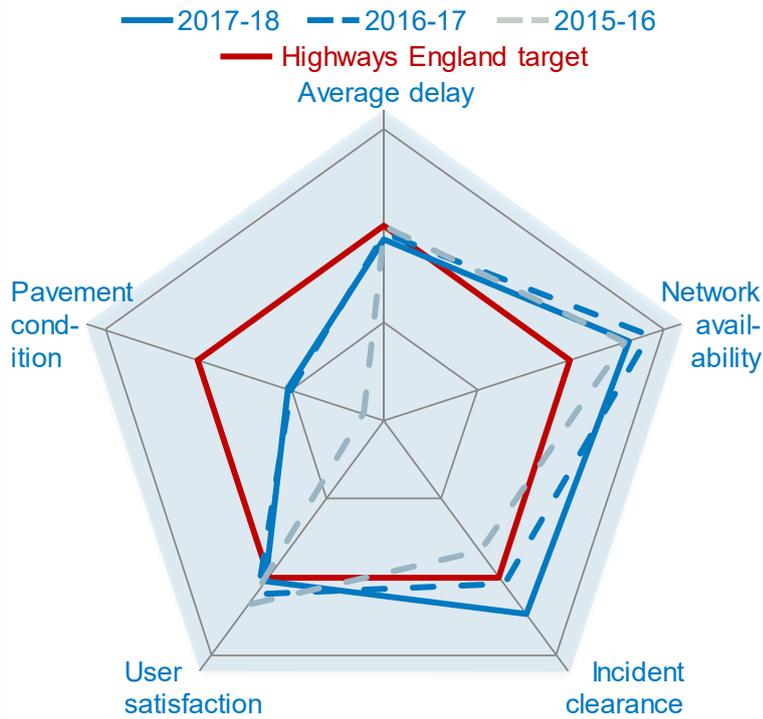
16. Highways England does not have a target for average delay and a range of factors likely affect this KPI, including: traffic levels, roadworks, incidents (and incident clearance), and the make-up of the network. Taken together, this makes regional performance difficult to assess.
17. There are likely to be links between the different elements of Highways England's performance specification. For example, the North West has the highest levels of delay and the lowest levels of user satisfaction. And the reductions in average delay in Yorkshire and North East have coincided with increased network availability in that region. However, we have not found robust statistical relationships between these KPIs when looking across all six regions and three years of data.

Regional dashboards

18. The following pages show dashboards that combine performance data from the first three years of the road period with data on the make-up of the network, traffic levels and Highways England's maintenance spending in each region. The data for the performance radar charts have been adjusted so that a larger shape represents 'good' performance for all of the KPIs.

19. Maintenance spending levels and possible implications for efficiency are discussed more below the dashboards. Annex A provides more detail on data sources; how we present the data in the performance 'radar charts'; and how we have treated parts of the network managed under DBFO contracts.
20. Highways England has put in place its own regional operational benchmarking programme. This covers a similar set of measures to the dashboards on the following pages. We plan to review how this is developing as part of a set of regular meetings with Highways England.

Performance relative to Highways England's target (or average for the delay KPI), 2017-18



East



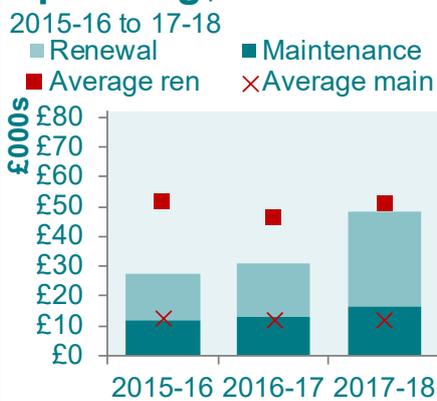
Regional stats



Road length measured in route miles, 2017-18



Spending per lane mile, 2015-16 to 17-18



Motorways



Dual carriageway A roads



Single carriageway A roads



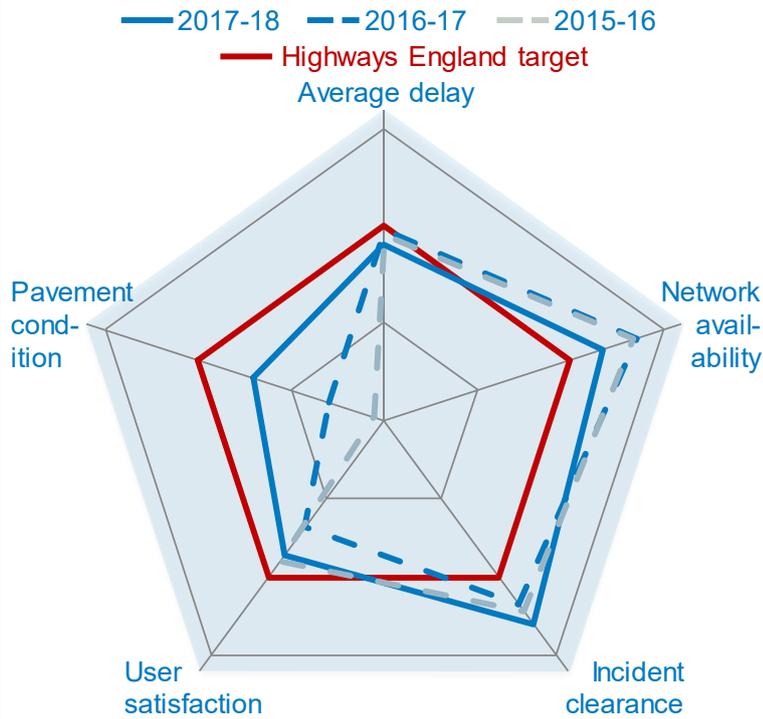
Traffic density

Annual average daily traffic flow, 2017 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

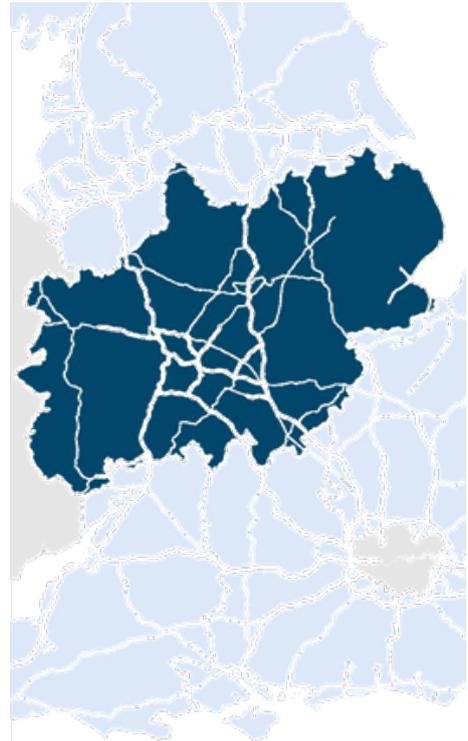
Percentage of HGV traffic



Performance relative to Highways England's target (or average for the delay KPI), 2017-18



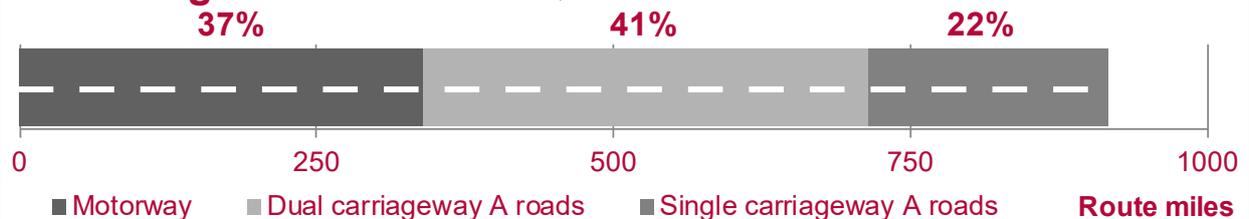
Midlands



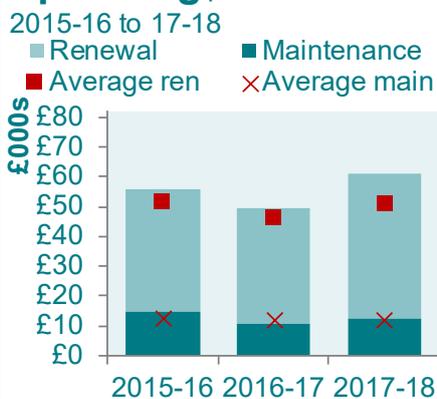
Regional stats



Road length

 measured in route miles, 2017-18


Spending

 per lane mile, 2015-16 to 17-18


Motorways



Dual carriageway A roads



Single carriageway A roads



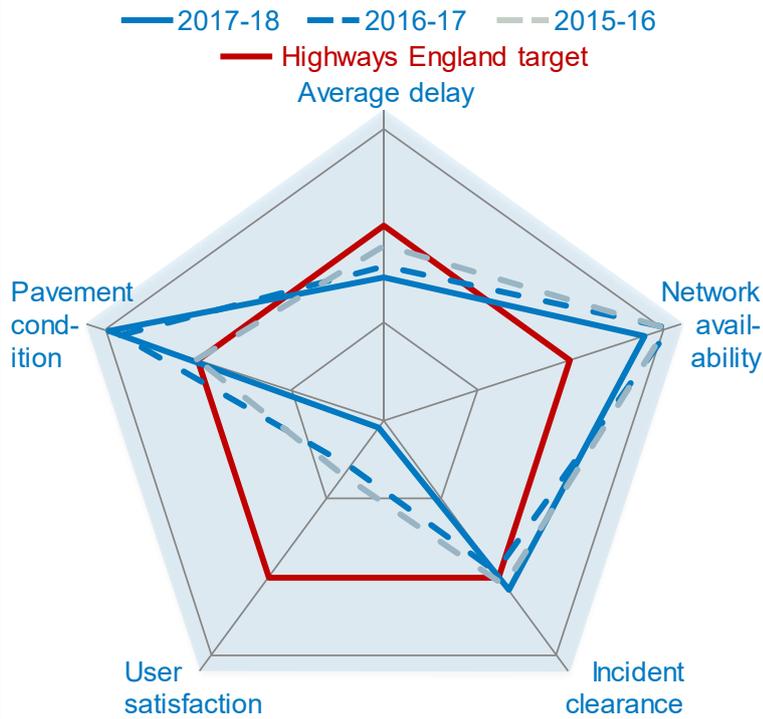
Traffic density

Annual average daily traffic flow, 2017 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

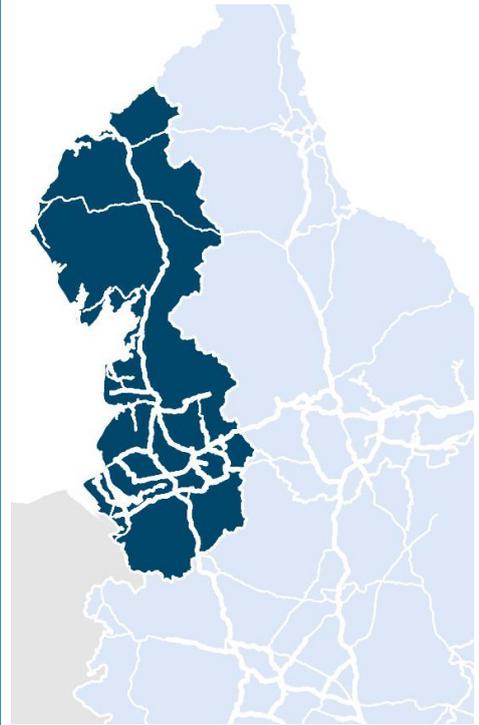
Percentage of HGV traffic



Performance relative to Highways England's target (or average for the delay KPI), 2017-18



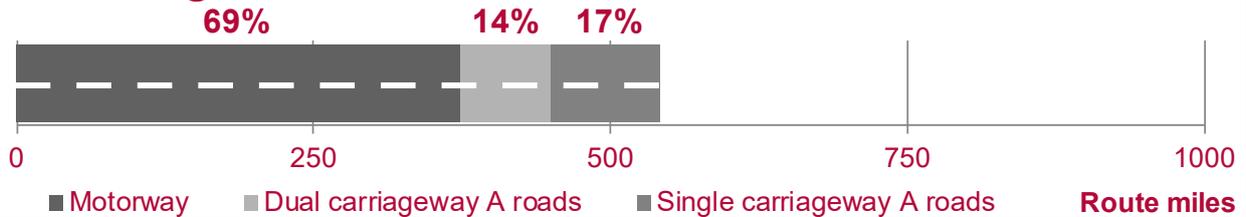
North West



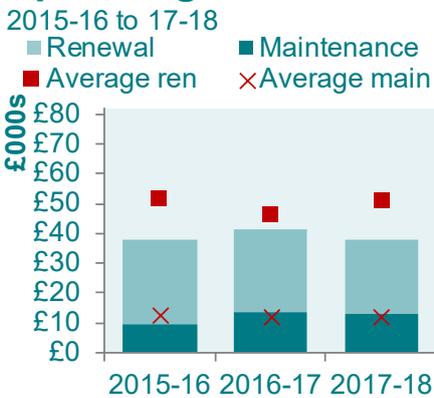
Regional stats



Road length measured in route miles, 2017-18



Spending per lane mile, 2015-16 to 17-18



Motorways



Dual carriageway A roads



Single carriageway A roads



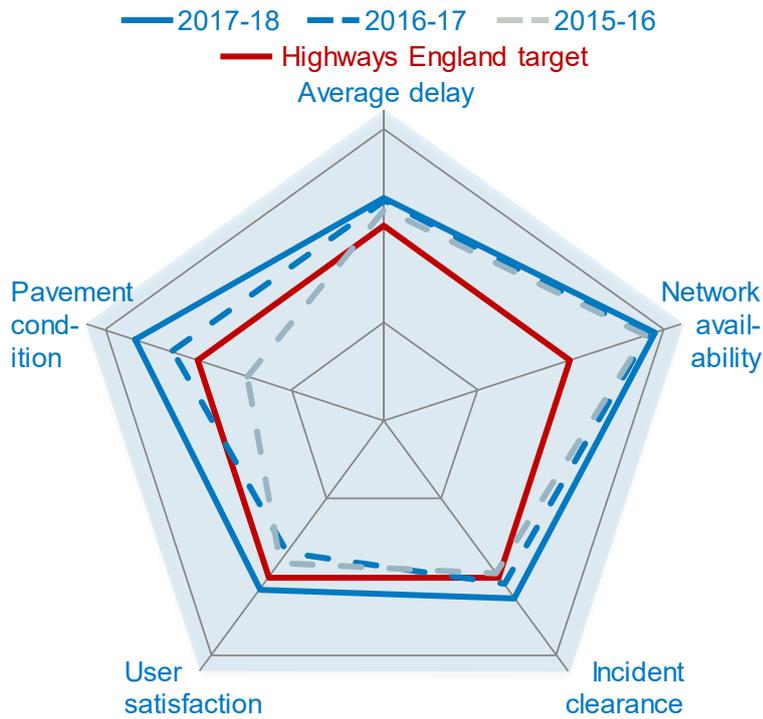
Traffic density

Annual average daily traffic flow, 2017
(vehicles passing a point on a road, in both directions, during an average 24 hour period)

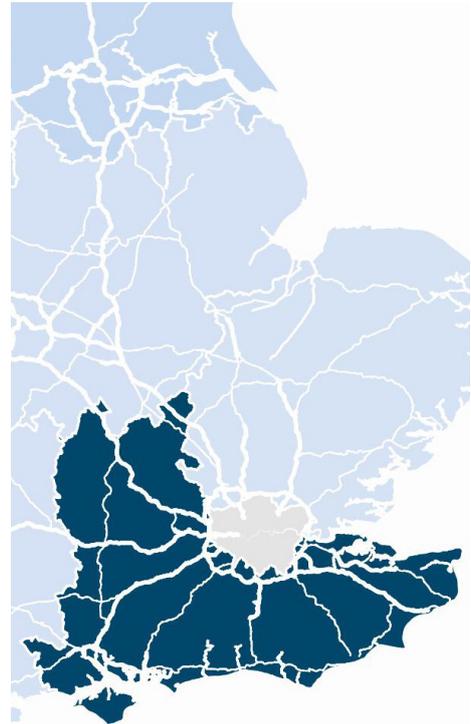
Percentage of HGV traffic



Performance relative to Highways England's target (or average for the delay KPI), 2017-18



South East

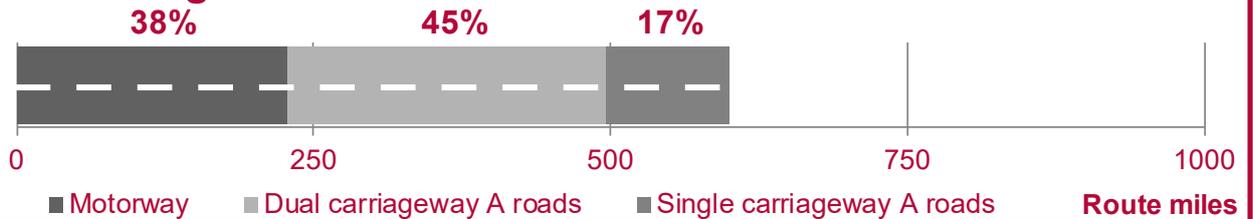


Regional stats



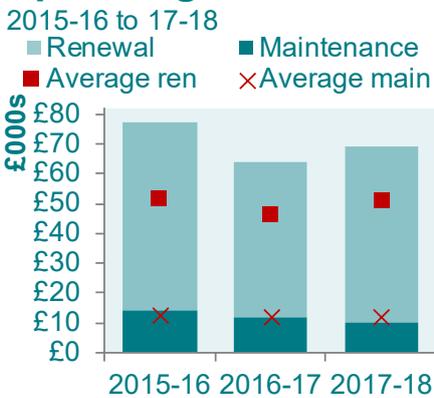
Road length

measured in route miles, 2017-18



Spending

per lane mile, 2015-16 to 17-18



Motorways



Dual carriageway A roads



Single carriageway A roads



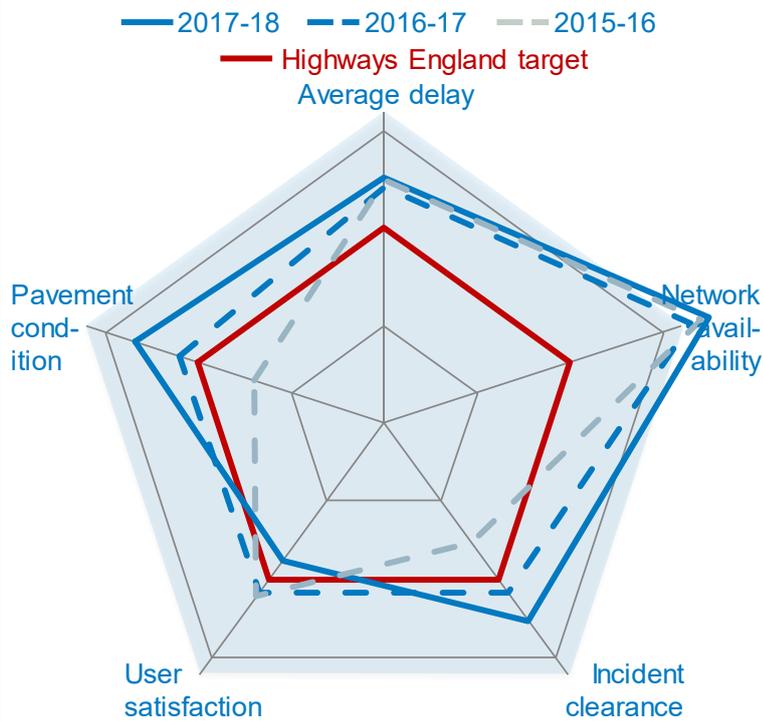
Traffic density

Annual average daily traffic flow, 2017 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

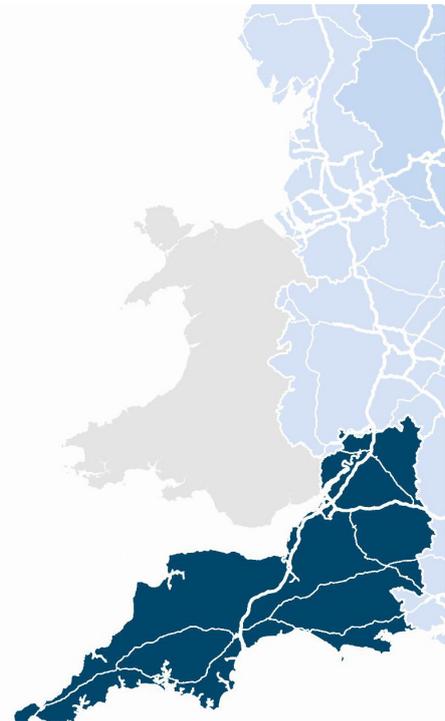
Percentage of HGV traffic



Performance relative to Highways England's target (or average for the delay KPI), 2017-18



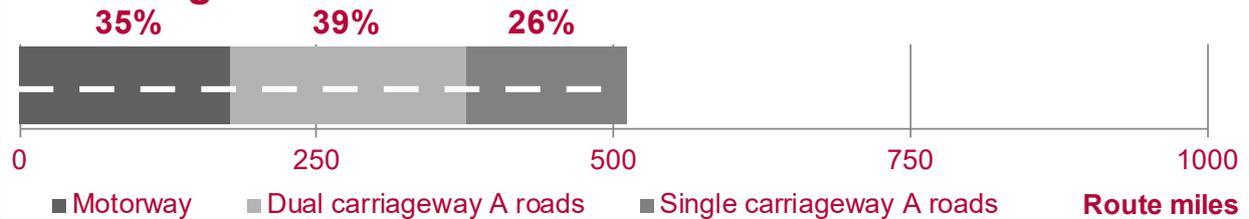
South West



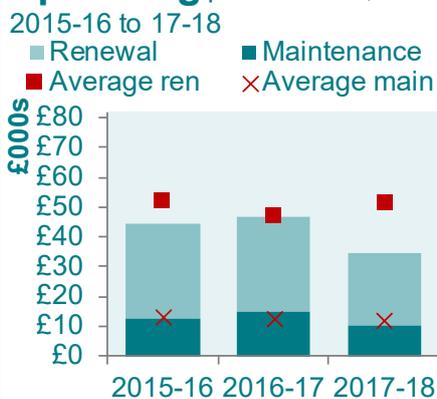
Regional stats



Road length

 measured in route miles, 2017-18


Spending

 per lane mile, 2015-16 to 17-18


Motorways



Dual carriageway A roads



Single carriageway A roads



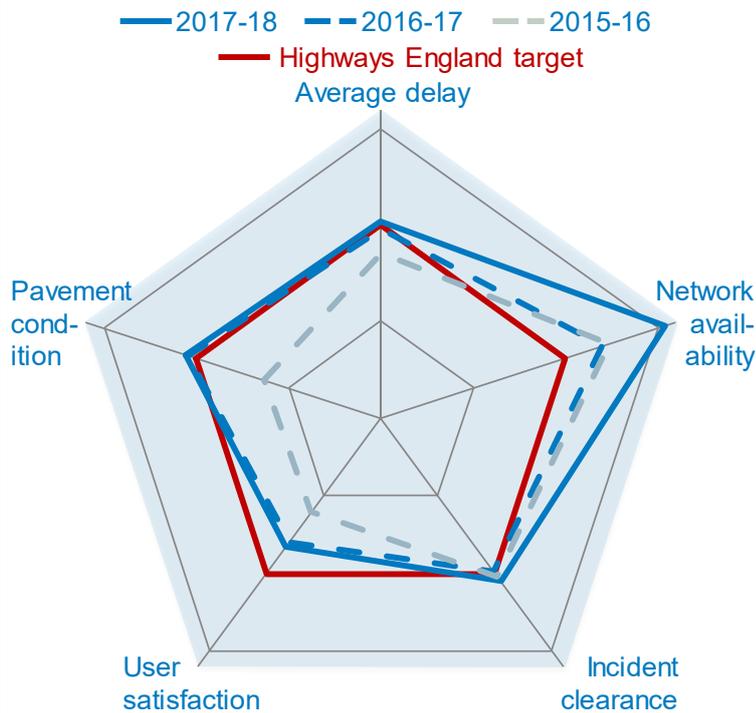
Traffic density

Annual average daily traffic flow, 2017 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

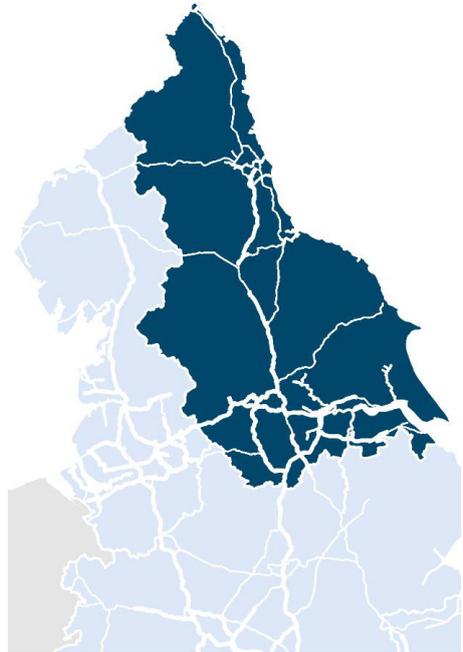
Percentage of HGV traffic



Performance relative to Highways England's target (or average for the delay KPI), 2017-18



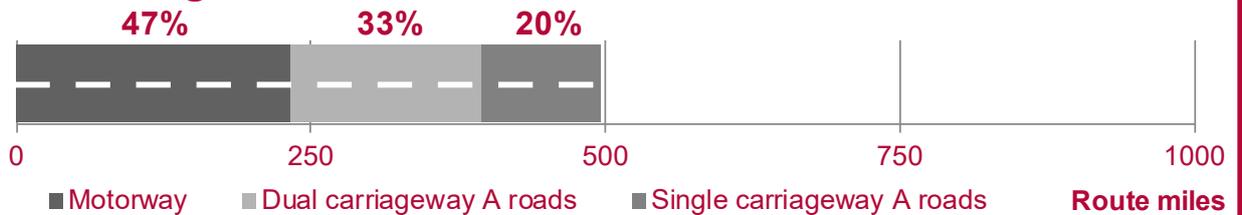
Yorkshire and North East



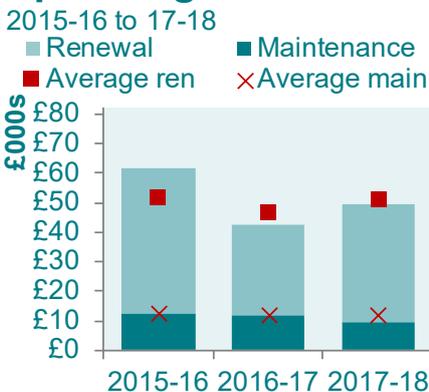
Regional stats



Road length

 measured in route miles, 2017-18


Spending

 per lane mile, 2015-16 to 17-18


Motorways



Dual carriageway A roads



Single carriageway A roads



Traffic density

Annual average daily traffic flow, 2017
(vehicles passing a point on a road, in both directions, during an average 24 hour period)

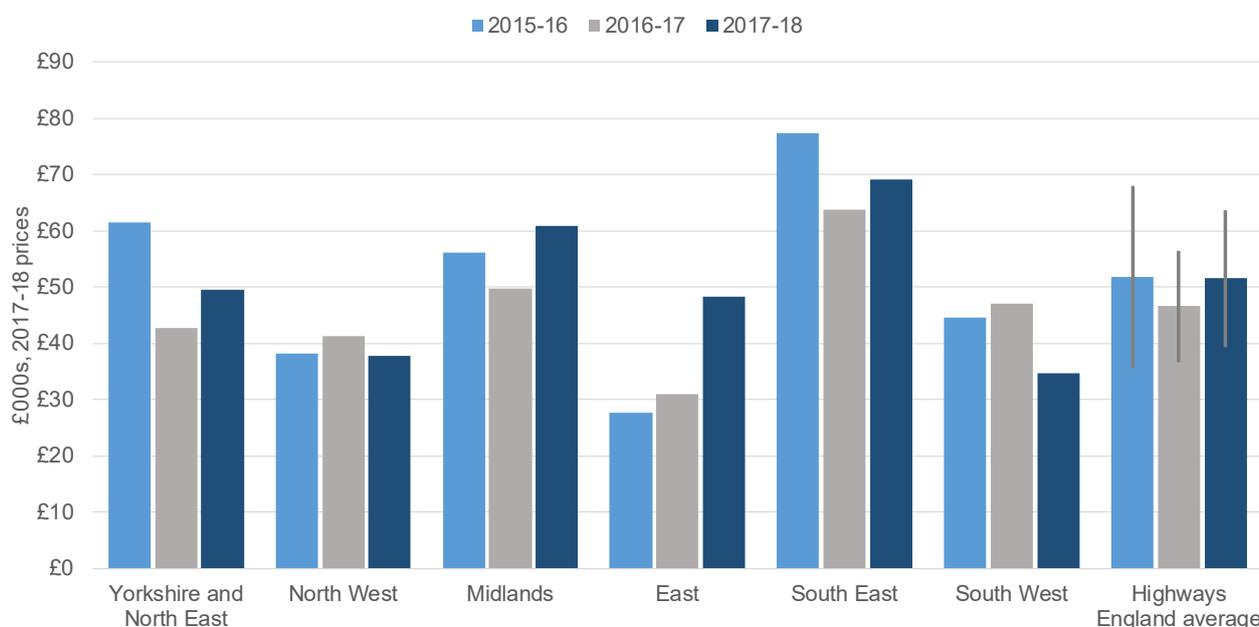
Percentage of HGV traffic



Highways England's regional maintenance spending

21. In last year's report we noted that average maintenance and renewal spending per lane mile had fallen, and the differences between regions had narrowed. Figure 7 shows that this trend has reversed in 2017-18 – the average maintenance spend per lane mile has increased and the differences between regions has widened. Capital renewal spending caused most of the increase in average spending and variation between regions.
22. This analysis includes (resource) maintenance and (capital) renewal spending but does not include spending on major projects or operations. There is likely to be some interaction between these different categories of spend. For example, Highways England might undertake additional renewal activity alongside major projects to reduce disruption for users.

Figure 7 Maintenance and renewal spend per lane mile, 2015-16 to 2017-18



23. A high-level unit cost like this masks a lot of complexity. It does not take account of the amount of activity that is delivered for the spending, or the nature (or cost) of that work. For example, the increase in spending could simply be the result of Highways England planning to undertake more renewals, or more expensive sorts of renewal activity, this year than last. Forecasts for 2018-19 suggest that the average spending and regional differences will reduce to a similar to level to that seen in 2016-17. And year-on-year variation of this sort could simply reflect Highways England's approach to managing its maintenance and renewal activity within its five-year funding.
24. Just as we could not conclude that last year's data definitively showed an improvement in efficiency, we cannot definitively conclude that this is evidence of

falling maintenance efficiency. A fuller understanding of what is happening with Highways England's maintenance efficiency requires good top-down and bottom-up evidence. It is important that Highways England can demonstrate that its plans are based around asset need, particularly in its planning for the second road period.

Developing our understanding of maintenance efficiency

25. To understand efficiency we need a deeper understanding of what drives maintenance spending. This is very complex, with potential drivers including:
 - the types of roads and structures making up the network;
 - traffic levels (including by vehicle type);
 - the age and underlying condition of the network; weather, climate and topography;
 - local labour, plant and materials costs; and
 - the factors that matter most might be different for (resource) maintenance and (capital) renewal.
26. Regulators, to varying degrees, have assessed the relative efficiency of regulated companies with econometric models of efficiency. Such models use data on outputs or cost drivers to explain the average relationship between these drivers and cost (of, for example, maintaining their network). This average relationship can be used to say what it 'should cost' for each firm (to maintain their network), and various statistical methods can then be used to split the difference between the 'should' and actual costs into model 'noise' and efficiency.
27. We used an aggregate measure of Highways England's regional maintenance and renewal spending to develop initial models of this sort. While this gave largely plausible results, the analysis was limited by the number of regions and potential cost drivers. And similar analysis in other sectors has typically used larger and longer-established data sets.
28. Highways England is now building up a more detailed data set that has several advantages:
 - it is at area, rather than regional, level, which means there are more data that can better support more detailed analysis;
 - spending can be split between (resource) maintenance and (capital) renewal, so that both separate and joint models can be developed; and

- there is a wider range of potential cost drivers.

29. We will continue to work with Highways England to develop its data collection and analysis. We expect developing robust efficiency models to be a long-term undertaking. There will be more short-term benefits as Highways England collects better data and improves its understanding of the costs and drivers of its maintenance activities.

International and cross-sectoral comparisons

30. In this section we provide a brief overview of several projects that have looked at different activities and compared Highways England with other countries or sectors. Reports from these projects are available on our website.¹

Measuring pavement condition

31. We commissioned a study to consider how Highways England measures the condition of its pavement (road surface) assets and how this compares with other road authorities in the UK and abroad. The objectives were to:

- compare how Highways England measures and monitors its pavement condition with practice elsewhere; and
- assess the extent to which we can benchmark Highways England's KPI and target for pavement condition against other networks.

Table 1 Summary of findings on measuring pavement condition

Road authority	Does the road authority measure the same pavement characteristics as Highways England?	Does the road authority have a similar metric / target to Highways England?
Local Authorities (Cornwall, South Lanarkshire)	To a considerable degree	Somewhat
TfL	Yes	Somewhat
Australia	To a considerable degree	No metric in place
Austria	Yes	Two indicators but not similar
Denmark	Yes	No metric in place
Netherlands	Yes	Yes
Scotland	Yes	Different metric, no target
Wales	To a considerable degree	Different metric, no target

32. The project's broad conclusion is that, as shown in the middle column of table 1, most road authorities use similar methods and equipment to measure similar pavement characteristics. There are some differences in the detail of how they do

¹ <http://orr.gov.uk/highways-monitor/publications/benchmarking-highways-englands-performance-and-efficiency>

this but these are relatively minor. For example, Highways England's surveys are more frequent and comprehensive than most other road authorities.

33. Most road authorities use indicators to monitor pavement condition for internal management and planning purposes. But, as shown in the right-hand column of table 1, different road authorities have tended to develop different indicators or metrics. And only a few of the comparators have developed these into formal performance metrics.
34. The Netherlands appears to be the best candidate as an external benchmark of pavement condition. Local Authorities and the Devolved Administrations also offer potential benchmarks. The former use more similar data and metrics, while the latter manage networks that are more similar to the SRN. We are considering whether to take forward a second project in this area, to assess in detail the feasibility of comparing pavement condition across these authorities.

Highways England and incident management

35. Following on from work we published last year looking at roadworks and planned disruption, we commissioned a study looking at how Highways England manages incidents and unplanned disruption on its network. The objectives of the study were to understand:
 - how Highways England, comparable road authorities and other relevant organisations manage, measure, target and incentivise clearing incidents from their network; and
 - the comparability of incident management performance measures used by Highways England and its comparators.
36. The study found that Highways England is performing well in this area and employs many elements of good practice seen in the comparators. The incident clearance KPI is well understood across the company and its experienced and competent staff underpin its strong performance in this area.
37. The study also identified opportunities for further improvement. Some of these relate to initiatives that are already underway, such as rolling out new incident management guidance across its regions. Other recommendations relate to stakeholder liaison – such as developing more consistent processes and relationships with local highways authorities – and to ensure that local good practice and innovation is harnessed nationally.
38. Highways England already has processes in place to disseminate best practice. For example, individual incidents that miss the target are reviewed routinely and regional

directors receive a comparison of performance across the network. Along with Highways England introducing an internal stretch target, these steps are likely to have contributed to the strong performance against the KPI target in this area.

39. As with pavement condition, there are common factors that many road authorities measure to monitor incident management. But table 2 shows that most comparators that have targets for specific metrics, target incident response times, rather than clearance times. This makes direct benchmarking of Highways England's performance challenging.

Table 2 Incident management KPIs and targets used by the comparators

Comparator	Target description	Target level / range
Midland Expressway (M6Toll)	Response and clear up times	
South Wales Trunk Road Agent	Response time	80% within 20 minute response between 0700-1900hrs
TfL	Incident resolution	90 mins to return network to normal operation
ASFINAG (Austria)	Average duration, number and average duration of complete closures, response time	
Vejdirektoratet (Denmark)	KPIs include response times and average clearance times for major incidents	Response times vary by road type and time of day: 20-45 minutes on motorways and specifically defined roads
Queensland Department of Transport and Main Roads (Australia)	Clearance times	
MidLink M7M8 (Ireland)	Response time	60 / 90 mins during / outside working hours
Rijkswaterstaat (Netherlands)	Arrival time after detection	80% within 15 / 30 mins during / outside of rush hours

Scoping options for benchmarking capital efficiency

40. To better understand our options ahead of our Efficiency Review, we commissioned a scoping exercise to assess options for benchmarking the efficiency of Highways England's capital spending. Based on case studies of approaches used in other regulated sectors, each option was considered for its feasibility (for RIS2 and in the longer-term), robustness, data requirements and effort / cost. The options considered

and their assessment against feasibility, robustness and effort criteria are summarised in table 3.

41. We are using this work to develop our plans for our Efficiency Review of Highways England's proposals for the second road period.

Table 3 Scoping assessment of options to benchmark capital efficiency

Option	Description	Feasibility for RIS2	Robustness for RIS2	Effort for RIS2
International benchmarking	Top-down benchmarking, including econometric and unit cost analysis, with: <ul style="list-style-type: none"> ■ overseas National Road Authorities, ■ Local Road Authorities, and ■ Highways England's regions / areas. 	Medium	Medium*	High
National benchmarking		Medium	Medium*	High
Internal benchmarking		High	Medium*	Medium
Bottom up unit cost analysis	Comparison of unit costs for specific activities against other construction, engineering or highways organisations.	High	Medium	Medium
Capex cost composition	Benchmarking proportion of project costs in categories such as design, project management, overhead, contingency etc.	Unclear**	Medium	Medium
Productivity trend analysis	Analysis of changes in productivity over time in firms or sectors of the economy engaged in similar activities to Highways England	High	Medium	Low
Delivery	Top-down comparison of outturn costs versus project budgets.	High	Medium	Low

* The robustness of international, national and internal benchmarking may be constrained for RIS2 by limitations in data availability/consistency, but robustness for these methods is more likely to be 'high' for RIS3.

** Despite uncertainties, experience from other sectors suggests this option may be feasible for RIS2.

Corporate services benchmarking

42. Highways England has completed a benchmarking exercise of its corporate services, like its legal, finance and HR functions. It used a leading benchmarking provider and focused the comparators on companies in similar sectors.
43. We expect this work to form part of the evidence informing Highways England's plans for the second road period. We will assess it as part of our Efficiency Review of those plans.

International road construction database

44. Over the past year we have continued to engage with the OECD-ITF² on its plans to establish an international database of road construction costs. Such initiatives typically take a long time and considerable effort to set up. But it would offer potentially useful information on how and why road construction costs vary between countries. So the importance of taking this project forward will depend in part on the evidence in Highways England's plans for the second road period and whether future plans would benefit from more international comparison.

² Organisation of Economic Cooperation and Development's International Transport Forum

Annex A – Regional dashboards

Calculating the performance radar charts

The ‘radar charts’ on each dashboard show regional performance relative to Highways England’s overall target. Performance has been normalised to the target level and is shown with the red line. If the blue line is outside the red target, then performance exceeded the target for that KPI in that region in that year. The exception is average delay, which has no target. For this KPI the red line represents average delay across the SRN as a whole in 2015-16, with regional performance presented relative to the national average. The table below sets out the outcome areas, metrics and targets for each of the five KPIs:

Outcome area	KPI metric	Target
Improving user satisfaction	Percentage of NRUSS respondents fairly or very satisfied	>90% NRUSS score by 31 March 2017
Supporting the smooth flow of traffic	Percentage of the network (measured in lane miles) open to traffic	>97% of the network available to traffic
	Percentage of incidents on motorways cleared within 1 hour	>85% of motorway incidents cleared within 1 hour
Encouraging economic growth	Average delay – the difference (in seconds per mile) between actual and free-flow speeds	No target
Keeping the network in good condition	Percentage of the pavement not requiring further investigation for maintenance	>95% of pavement not requiring further investigation

Average delay

As discussed above, performance against this KPI is represented against the average for the SRN, as there is no target. Lower delay represents better performance so the data are transformed in the following way:

$$Average\ delay = 1 + \left(1 - \frac{average\ delay_{region}}{average\ delay_{SRN}} \right)$$

Network availability, incident clearance, user satisfaction and pavement condition

These four KPIs are all measured in percentage terms, with a higher number representing better performance. However, the targets for all four KPIs are relatively close to 100%,

making it difficult to demonstrate variation between the regions. Therefore each metric, and its respective target was transformed as shown in the table below:

	KPI	Target	Transformed KPI	Transformed target
Network availability	% lane availability	>97%	% lane un availability	<3%
Incident clearance	% incidents cleared within 1 hour	>85%	% incidents not cleared within 1 hour	<15%
User satisfaction	% fairly or very satisfied	>90%	% not fairly or very satisfied	<10%
Pavement condition	% of pavement not requiring further investigation	>95%	% of pavement not requiring further investigation	<5%

These transformations produce metrics where a lower score is better. The transformation used for average delay is then applied for presentation in the radar charts. If performance were more than double the target level (for example, if >6% of the network were unavailable), this would give a score of 0. Any such scores are adjusted to 0.05, so as not to appear as 'zero performance' in the radar charts. The 2015-16 regional pavement condition data are based on a pro-rata adjustment to the performance reported that year, to reflect the revised figure for the network as a whole in that year.

Treatment of DBFO-managed sections of the network

Management of the SRN is split into a series of areas and regions. There are thirteen areas, one of which (the M25) is managed by a private contractor under a Design, Build, Finance, Operate (DBFO) contract. The other twelve areas are combined together into six regions, with two areas in each region.

Including the M25, there are eleven sections of the network managed under DBFO contracts. Private operators are appointed to design, build and finance major improvements to the network, and to operate (maintain and renew) it over a 30-year period. The regional dashboards, including the network and traffic data, relate only to those parts of the network managed by Highways England's regions – DBFO-managed roads are excluded. The user satisfaction KPI in the radar charts is the exception, as it is not possible to differentiate between DBFO and non-DBFO sections of the network.

The maps on the dashboards show the SRN but do not differentiate between sections that are directly managed by Highways England's regions.³ More detail on which parts of the network fall into each region, and which are managed by DBFO operators, can be found here: <https://www.gov.uk/government/publications/roads-managed-by-the-highways-agency>

Regional stats, road length, spending and traffic

Population

Regional population estimates for mid-2017 were sourced from the ONS and are rounded to nearest 100,000 in the dashboards:

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

GVA per head

Gross value added (GVA) data for 2017 were sourced from ONS; divided by regional population to give GVA per head; and are rounded to the nearest £250 in the dashboards:

<https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedincomeapproach>

Structures

The number of structures on each region of the SRN is sourced from Highways England's Structures Management Information System (SMIS)). The main categories of structures included are:

- bridges and large culverts,
- masts,
- retaining walls,
- road tunnels, and
- signs and / or signal gantries.

Road length

Two measures of the length of the SRN are presented in the dashboards:

³ Use of the data included in the maps is subject to terms and conditions. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which Office of Rail and Road makes it available; You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form; and Third party rights to enforce the terms of this licence shall be reserved to Ordnance Survey.

- route length, split by road type – the sum of the main carriageway lengths only (e.g. excluding slip roads) with a factor of 0.5 applied to dual carriageways; and
- lane length – the sum of the carriageway sections multiplied by the number of permanent running lanes (i.e. hard shoulders are excluded).

Data were sourced from Highways England’s pavement management information system (HAPMS) and represent a snapshot for 31 March 2018.

Spending

Maintenance and renewal spending data were sourced from statements F2.1 and F3.1 of Highways England’s 2017-18 performance monitoring statements. The spending figures are divided by the lane length data described above to give a figure per lane mile, and are compared with the average across the six regions:

<https://www.gov.uk/government/publications/highways-englands-2017-to-2018-performance-monitoring-statements>

Traffic

Traffic data are for 2017 and were sourced from DfT Road Traffic Statistics. Traffic on DBFO-managed roads was separately identified but the regional boundaries do not exactly match the boundaries of Highways England’s regions. The source data gives vehicle kilometres in 2017 by road and vehicle type. We have converted this to annual average daily traffic flow by dividing annual vehicle miles (for all vehicle types) by route length (as defined above) and then by 365 days to give the daily average.

Flow refers to the number of vehicles passing a point on a road over a given period of the time. The annual average daily traffic flow represents the number of vehicles (travelling in both directions) that would pass a point on the network during an average 24 hour period in 2017.

The percentage of HGV traffic is the proportion of HGV miles in total vehicle miles.



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