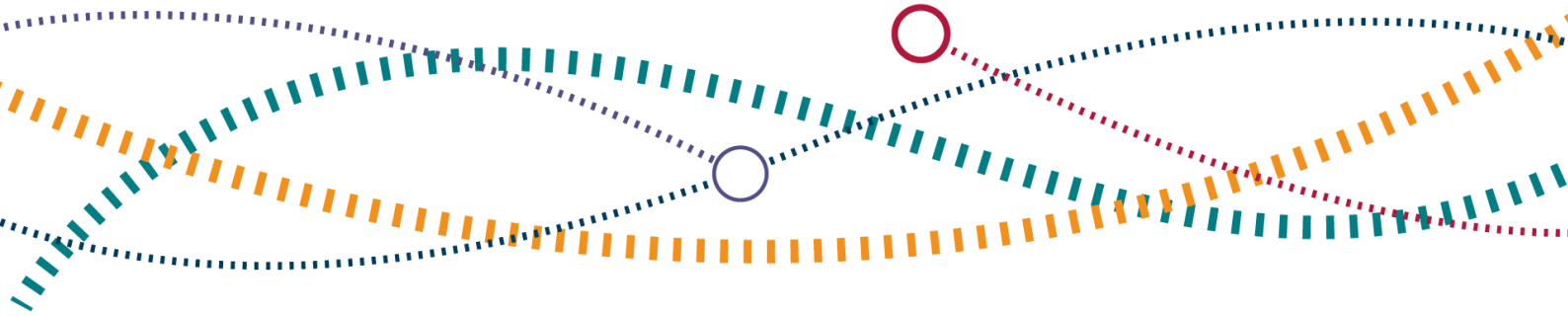
OFFICE OF RAIL AND ROAD

Benchmarking Highways England

2020 Progress Report

February 2021



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Executive summary

Benchmarking Highways England's performance and efficiency is an important part of our role as the Highways Monitor. It informs our monitoring of Highways England's delivery, increases transparency of the company's performance, and informs our assessment of Highways England's plans for future road periods. This report summarises the benchmarking activities we have undertaken during the first road period from 2015 to 2020 (RP1) and provides an update on our planned activities for road period 2 (RP2).

Much of our focus in RP1 has been on benchmarking the performance and efficiency of Highways England's regions. During RP1, we maintained an annual database of regional data for five of Highways England's key performance indicators (KPIs).

We hold Highways England to account for achieving targets that are set at a national level and we acknowledge that a degree of regional variation will always exist. Nevertheless, comparing Highways England's regions furthers our understanding of the drivers of performance, ultimately leading to better outcomes at a national level.

This is the last report dealing with performance in RP1 which allows us to summarise regional KPIs over the full five-year period. In RP2, in line with the government's expectations, we will ensure that Highways England expands the range of indicators that are available at a regional level.

In our Annual Assessment, we reported that Highways England had made good progress in its first five years and this is reflected in the improvements we have seen at a regional level. Even so, there are indicators for which large differences in regional performance remain.

By the end of RP1, each of Highways England's regions exceeded the national-level target for both Network Availability (97% Network Availability) and Incident Clearance (85% of incidents cleared within 1 hour). For Network Availability, variation in regional outcomes narrowed during RP1, although this was partly the result of a slight decline in performance in the South East and South West. All regions significantly improved their performance in respect of the speed of Incident Clearance.

The condition of the Strategic Road Network (SRN) has also improved during RP1. At a national level, Highways England met its national-level target of ensuring 95% of the network requires no further investigation for possible maintenance. Each of the regions improved their performance against this measure in RP1. Highways England has improved its processes for reporting and managing the condition of the network and this is reflected

in less variation in performance across the regions. Two regions – Midlands and East – ended RP1 below the national-level target for road condition.

User Satisfaction varies significantly across Highways England's regions and scores can fluctuate from year-to-year. In the first four years of RP1, the East region maintained the highest level of user satisfaction, although its score dipped slightly in 2019-20. The largest improvements in RP1 were seen in Yorkshire and the North East. In 2019-20 this was the only region to exceed the national-level target with over 90% of users reporting that they were very or fairly satisfied with their last trip on the SRN.

Analysing differences in maintenance activities and costs by region or area can provide important insights into Highways England's efficiency. There was a gradual reduction in maintenance spending during RP1. Due to the nature of renewals activities, spending fluctuated from year-to-year with large differences in spending across the regions. Determining whether lower spending is a product of improved efficiency requires more detailed regional cost, output, and condition data than has been available to date. Ensuring that Highways England improves the quality of such data is a key area of focus for us in RP2. As Highways England rolls out new approaches to maintaining the network, we expect to see a clearer link between spending and asset need, and greater transparency regarding differences in spending across regions.

Alongside our regional benchmarking, we have also undertaken a range of targeted investigations during RP1. Topics covered during these investigations include operating efficiency, traffic conditions, roadworks management and incident management. These studies played an important role in informing the RIS2 efficiency review published in March 2020. In this report, we include an analysis of the safety performance of motorways for a selection of European countries.

Over the coming year, in additional to our regional benchmarking series, we are planning to commission a detailed study to compare road condition on the SRN with a selection of comparator networks. We will also continue to investigate opportunities to learn from road authorities elsewhere, both in respect of quantitative benchmarking and more qualitative investigations into specific topics relevant to Highways England's performance in this and future road periods.

Introduction

1.1 This is the fifth annual benchmarking progress report. It is the final report dealing with performance during the first five-year road period (RP1, 2015 – 2020). This report summarises our monitoring of Highways England's performance at a regional level and catalogues the other benchmarking activities we have undertaken.

Benchmarking Highways England

1.2 The Office of Road and Rail (ORR) independently monitors Highways England's management of the Strategic Road Network (SRN) – the motorways and main A-roads in England. We have essential role to play in helping to secure value for public money in the operation of the SRN. One of the tools we use to analyse Highways England's performance is benchmarking – either benchmarking Highways England against similar organisations elsewhere, or benchmarking Highways England's internal regional delivery units.

1.3 Benchmarking helps to identify opportunities to deliver improvements in performance and efficiency. It informs our monitoring of Highways England's delivery, increasing transparency of the company's performance. We also scrutinise Highways England's plans for future roads periods; benchmarking helps us to identify the improvements in performance and efficiency we could expect Highways England to achieve in the future. Ultimately, through all our monitoring and benchmarking activities, our objective is to deliver better outcomes for users and improved value for money for the taxpayer.

1.4 Benchmarking is not without its challenges. The availability of high quality, comparable, datasets for different highway networks is much poorer than we would like and our ability to compare Highways England against other road authorities is limited by the lack of similar organisations elsewhere. As we set out in our plan in 2016, we expect our benchmarking activities to evolve over time as more data becomes available and as we respond to the issues which most directly impact performance and reflect policy priorities.

2020 progress update

1.5 During RP1, much of our efforts have been focused at benchmarking the performance and efficiency of Highways England's regions. Analysing variations at a regional level can further our understanding of the drivers of performance at a

national level. In RP1 we have maintained a limited suite of key performance indicators (KPIs) at a regional level.

1.6 In our view there is considerable scope to improve the way in which variations in performance at a regional level are monitored and explained. In RP2, we expect Highways England to make available a broader range of indicators at regional level.

1.7 Alongside our regional benchmarking activities, we have also undertaken a range of targeted investigations during RP1. These studies informed our assessments of Highways England's plans for the RP2 – the RIS2 efficiency review. They have also helped to inform our future approach to benchmarking. In this report we take the opportunity to summarise some of the key studies that have been undertaken. We have also included an update to work we undertook in 2016 to compare the safety performance of motorways internationally.

1.8 Last year we set out the three main areas around which our benchmarking activities will focus in RP2: regional or internal benchmarking; developing better evidence on pavement (road surface) condition and maintenance costs; and targeted analysis of other sectors and countries. As outlined above, improving regional benchmarking will be a key focus in 2021. Furthermore, in this report, we provide more detail on our plans in relation to pavement condition and costs.

Benchmarking Highways England's regions

Key performance indicators

2.1 Highways England is sub-divided into six different regions[1]. We benchmark the performance of the regions against a subset of five KPIs across four of the outcome areas that make up Highways England's performance specification. These are: Improving User Satisfaction, Supporting the Smooth Flow of Traffic, Encouraging Economic Growth and Keeping the Network in Good Condition.

2.2 We continue to hold Highways England to account for achieving targets that are set at a national level and we accept that a degree of regional variation will always occur. Hence, national-level performance remains the focus of our Annual Assessments. Nevertheless, as stated above, tracking KPIs at a regional level offers insights that are not apparent in the national-level data.

2.3 The national-level targets provide a useful yardstick, although we do not require that each of the regions achieves the national target. However, we expect to see differences between the regions narrow as Highways England works to improve outcomes across the network.

2.4 In the Second Road Investment Strategy, the government set out that it expects to see Highways England publish more regional data. As such, we expect the list of performance indicators available at regional level to expand considerably in RP2.

2.5 This report draws from a five-year time-series (from 2015-16 to 2019-20) to summarise regional performance during RP1. The coronavirus pandemic only began to significantly affect the country's travel patterns in the last few weeks of the road period and did not materially affect the performance indicators in 2019-20. Where possible we also draw out relationships across the KPIs or between the KPIs and other measures. As a result of limited data and the small sample size, our findings in this respect are only tentative. With Highways England's input we expect to be able to do more in RP2 to explain regional variations.

[1] Analysis excludes the network managed under Design, Build, Finance and Operate (DBFO) arrangements.

Figure 2.1 Key performance indicators and national-level targets[2]

User Satisfaction

Target: 90% of users who are very or fairly satisfied
Achieved: 89.2% overall satisfaction at the end of RP1

Network Availability

Target: 97% of the network available to traffic
Achieved: 98.2% network availability at the end of RP1

Incident clearance

Target: At least 85% of incidents must be cleared within one hour
Achieved: 89.1% cleared within one hour at the end of RP1

Average delay

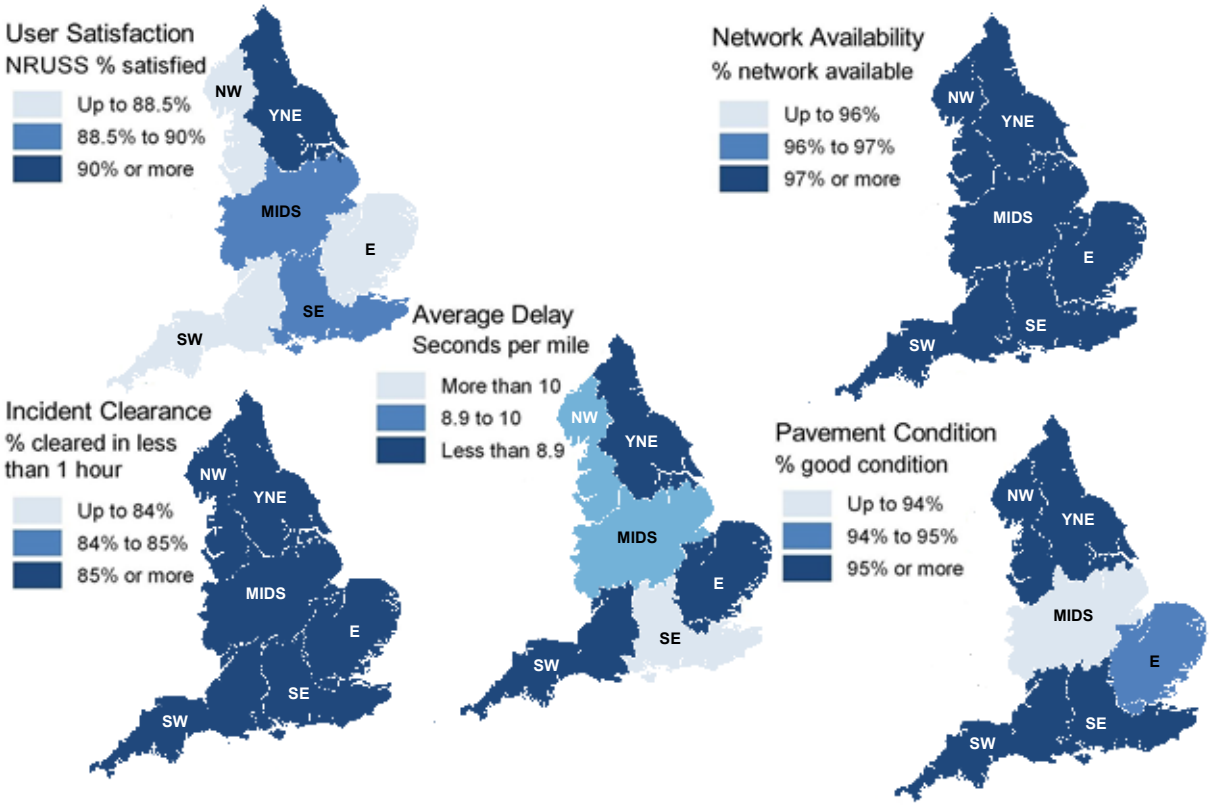
Highways England must work to minimise average delay
Achieved: 9.3 seconds delay per vehicle mile

Pavement condition

Target: 95% of pavement requiring no further investigation for maintenance
Achieved: 95.5% requires no further investigation for maintenance

[2] For RP1, national level targets were set for all indicators with the exception of 'Average Delay'

Figure 2.2 Highways England regional KPI performance, 2019-20[3,4]



[3] Contains Ordnance Survey data © Crown copyright and database right 2016.

[4] Excludes the network managed under Design, Build, Finance and Operate (DBFO) arrangements.

Table 2.1 Highways England regional KPI performance, 2019-20 and percentage point change between 2015-16 and 2019-20[5]

Regions	User Satisfaction		Network Availability		Incident Clearance		Average Delay		Pavement Condition	
	2019-20	% point change from 2015-16	2019-20	% point change from 2015-16	2019-20	% point change from 2015-16	2019-20	change from 2015-16	2019-20	% point change from 2015-16
Yorkshire and North East	92.6%	▲ 6.5%	98.3%	▲ 0.6%	89.5%	▲ 4.2%	8.06	▲ −2.2	96.9%	▲ 3.7%
North West	85.2%	▲ 1.7%	98.3%	▼ −0.2%	89.6%	▲ 3.8%	8.98	▲ −0.86	96.7%	▲ 1.7%
Midlands	89.9%	▲ 0.8%	98.0%	▲ 0.0%	89.8%	▲ 1.6%	9.22	▲ −0.14	93.7%	▲ 4.1%
East	88.2%	▼ −3.6%	98.4%	▲ 0.5%	87.7%	▲ 5.2%	8.83	▲ −0.16	94.3%	▲ 3.8%
South East	88.7%	▼ −0.4%	97.9%	▼ −0.3%	88.5%	▲ 3.8%	11.1	▼ 2.91	96.5%	▲ 2.8%
South West	88.2%	▼ −2.9%	98.5%	▼ −0.6%	88.7%	▲ 7.2%	8.04	▼ 1.36	95.3%	▲ 1.8%
Highways England	89.2%	▼ −0.1%	98.2%	▼ −0.2%	89.1%	▲ 3.1%	9.33	▼ 0.4	95.4%	▲ 3.1%

[5] For average delay the change between 2015-16 and 2019-20 is given in seconds per vehicle mile.

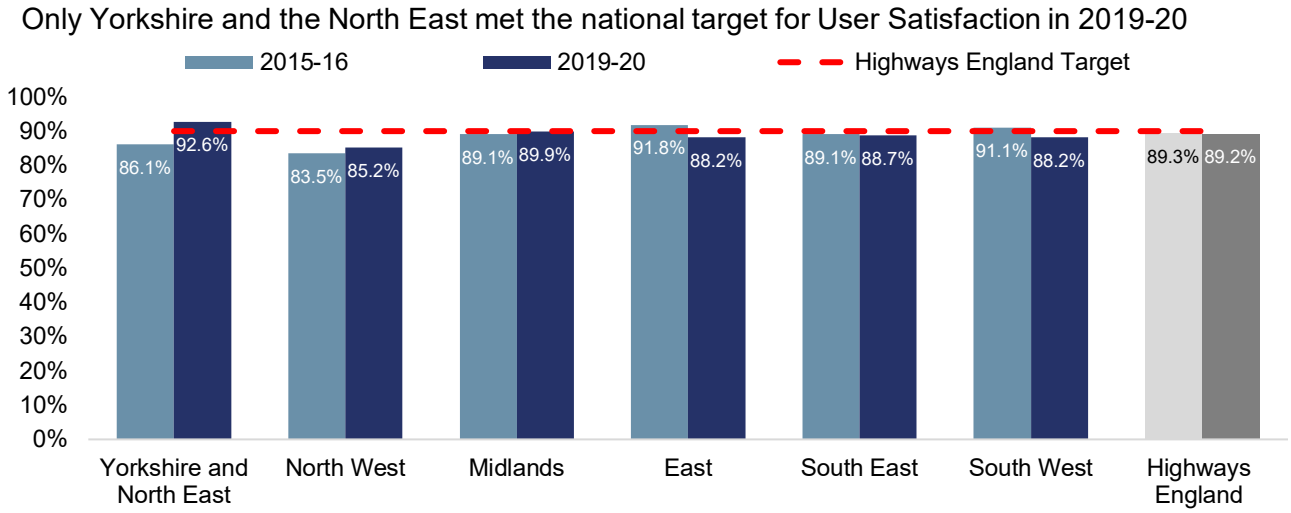
User satisfaction

2.6 Transport Focus' road user satisfaction surveys provide a basis on which we can compare user satisfaction in different parts of England and assess how perceptions are changing over time. The data in this report is taken from the National Road Users' Satisfaction Survey (NRUSS).

2.7 The overall measure of user satisfaction used is the percentage of respondents who report that they are very or fairly satisfied with the SRN. At the end of first road period, user satisfaction at a national level stood at 89%, slightly below the 90% national-level target. There were fluctuations across the five-year period with no obvious trend of either improvement or decline.

Figure 2.3 shows the performance of each of Highways England's regions in the first and last years of RP1. The chart compares the regions against the Highways England average and the national-level target for the KPI. As noted, whilst the national-level target provides a useful yardstick, we do not require that each of the regions meets this target.

Figure 2.3 Percentage of survey respondents who are very or fairly satisfied, 2015-16 to 2019-20



2.8 Yorkshire and the North East was the only region to achieve sustained improvements in user satisfaction. In 2019-20, it was the only region with levels of satisfaction above the national-level target. In contrast, user satisfaction fell slightly in the East and South West in the same period.

2.9 Measures of user satisfaction can fluctuate and caution should be applied when comparing regional results in any given year. In view of this we have also calculated average user satisfaction for the full five-year period. The five-year results are provided in Figure 4.

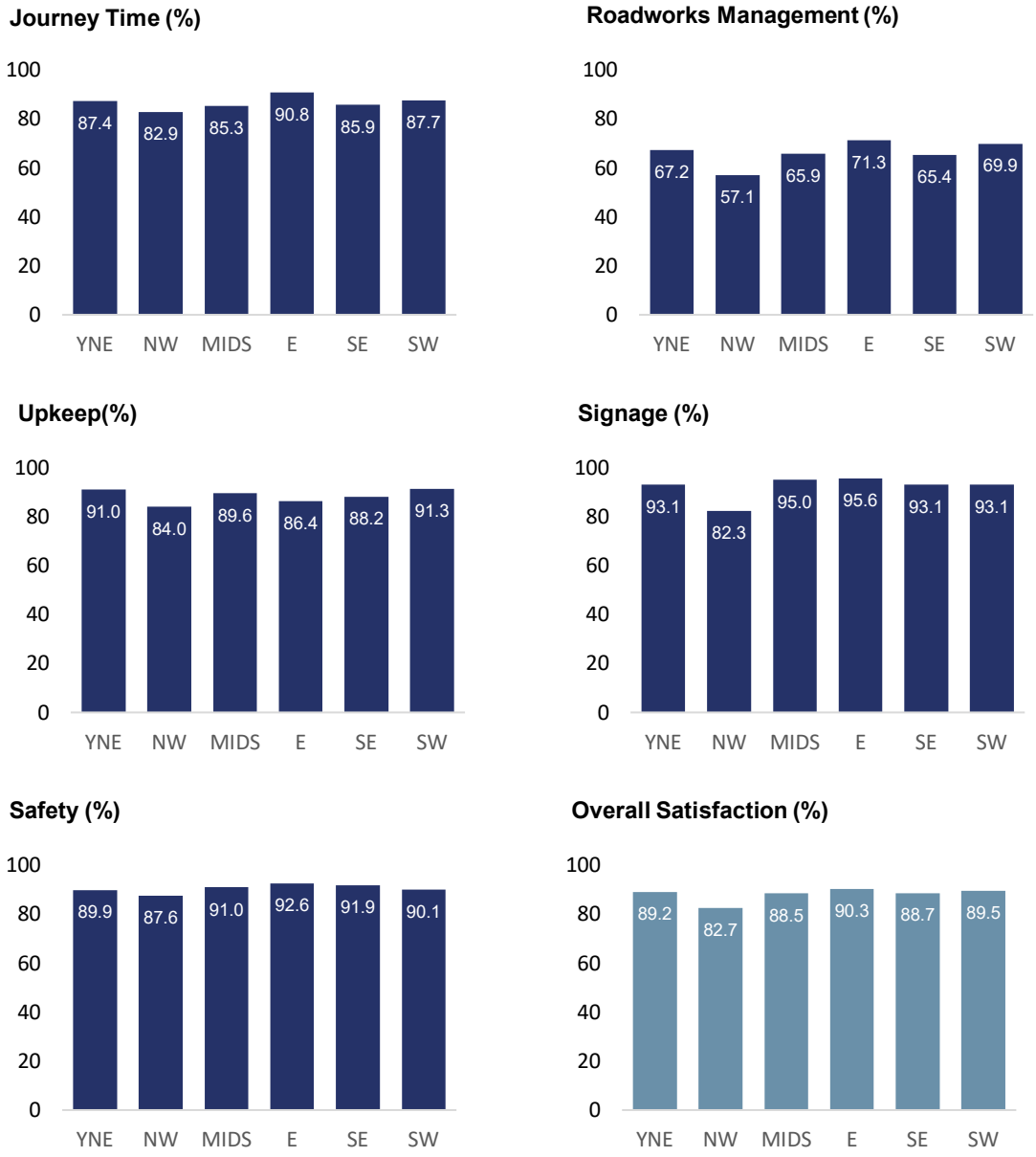
2.10 Looking at RP1 in its entirety, average user satisfaction was the highest in the East region at just over 90%, despite the decline in user satisfaction in this region in 2019-20. By some margin, average user satisfaction during RP1 was the lowest in the North West.

2.11 Figure 4 also shows data for the individual components of user satisfaction. For some components – notably safety and journey time – levels of satisfaction are relatively similar across the regions. There are much more significant differences in performance in respect of roadworks management and the upkeep of the Network.

2.12 In RP1, the East showed the highest levels of user satisfaction for each of the five components except for upkeep. In contrast, the North West had the lowest levels of satisfaction for all components. This suggests a degree of correlation between the component measures of satisfaction. For example, a user who experiences roadworks during their journey is more likely to report low levels of satisfaction with journey times.

2.13 During RP2, the Strategic Road User Survey (SRUS) will replace NRUSS as the main measure of user satisfaction. SRUS uses a more granular approach and should allow us to dig deeper into factors that have the greatest influence on user satisfaction.

Figure 2.4 Component measures of user satisfaction during RP1[6]



[6] Average score across 60-months between April 2015 to March 2020

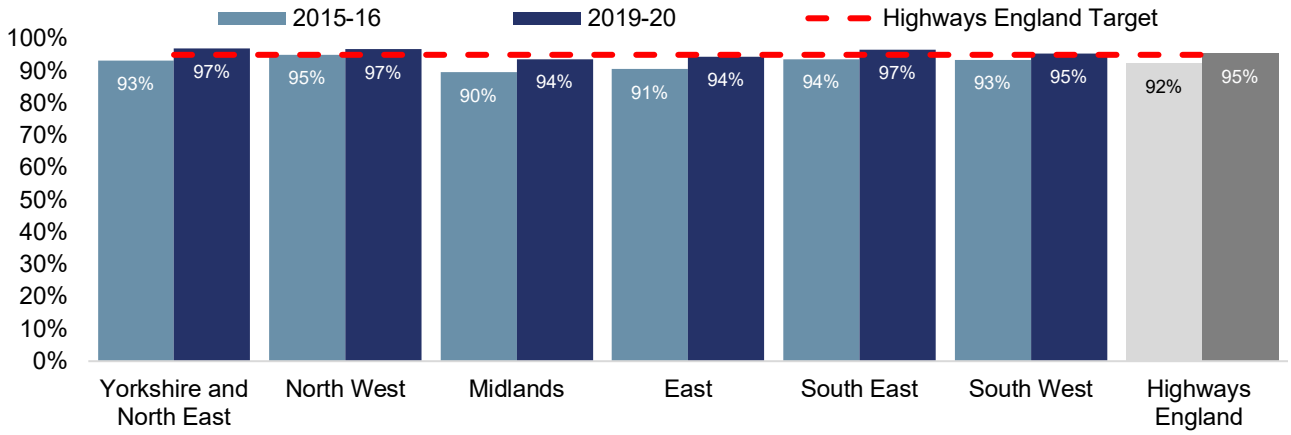
Pavement condition

2.14 Transport Focus has highlighted that the quality of the road surface is an important factor influencing those who report themselves to be dissatisfied with the upkeep of the network. It also influences users' perceptions of safety[7].

2.15 The percentage of the SRN road surface not requiring further investigation for maintenance was below the national-level target of 95% in the first two years of the road period. In subsequent years, Highways England met the national-level target, achieving 95% and 96% in third and fourth years, respectively, before falling back to 95% at the end of RP1.

Figure 2.5 Percentage of pavement not requiring further investigation, 2015-16 to 2019-20

All regions improved pavement condition during RP1



2.16 Pavement condition improved across all regions in RP1. Variations in regional outcomes narrowed such that the differences in performance across the regions are now relatively slight. In 2015-16, five of the six regions were below the national-level target. In 2019-20, just two regions - East and Midlands - remained one percentage point below the national-level target. One possible cause is the prevalence of concrete road surfaces in these regions. This is an issue which Highway England has identified within its business plan for RP2 and it will be undertaking a specific programme of concrete renewals over the next five years.

2.17 It might be expected that the regions that have spent more on renewing the road surface will have achieved the largest improvements in pavement condition. A simple cross-tabulation of the change in pavement condition and average

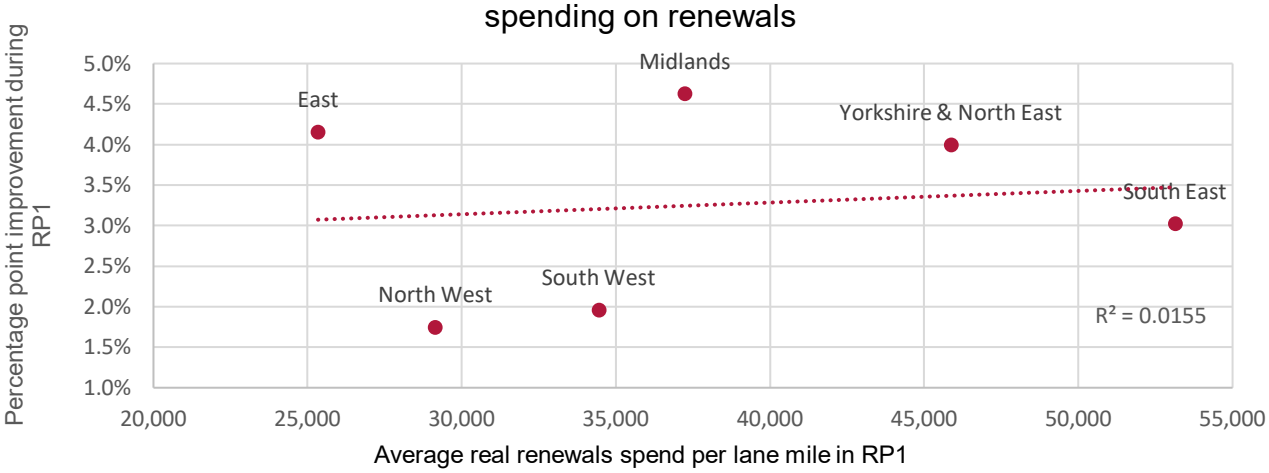
[7] National Road User's Satisfaction Survey, 2019-20

renewals spending per lane mile over the five-year period only provides weak evidence of a correlation. In reality renewals costs relate to a wide range of activities that do not necessarily relate directly to pavement condition and, at this point, we are unable to separate these out. It may also be the case that some regions will face consistently higher costs in order to maintain the network to a high standard due to factors such as different weather conditions or traffic levels. More granular data on regional maintenance and renewals expenditure and outputs by activity (similar to that which is available at a national level) would enable us to explore these relationships in more detail.

2.18 We find no obvious relationship between pavement condition and traffic density although, all things being equal, higher levels of traffic, particularly heavy goods vehicles would be expected to result in more rapid deterioration of the road surface.

Figure 2.6 Improvement in pavement condition vs spend per mile on renewals

No evidence of a positive correlation between improvements in pavement condition and spending on renewals



2.19 During RP2, Highways England will develop new measures of road condition to address some of the limitations of the metric used in RP1. The new KPI metric will take account of the condition of all live traffic lanes, giving us an overview of the entire road surface, which better aligns with maintenance activities. Highways England is also working with Transport Focus to develop a performance metric which is more focused on "ride quality" experienced by users.

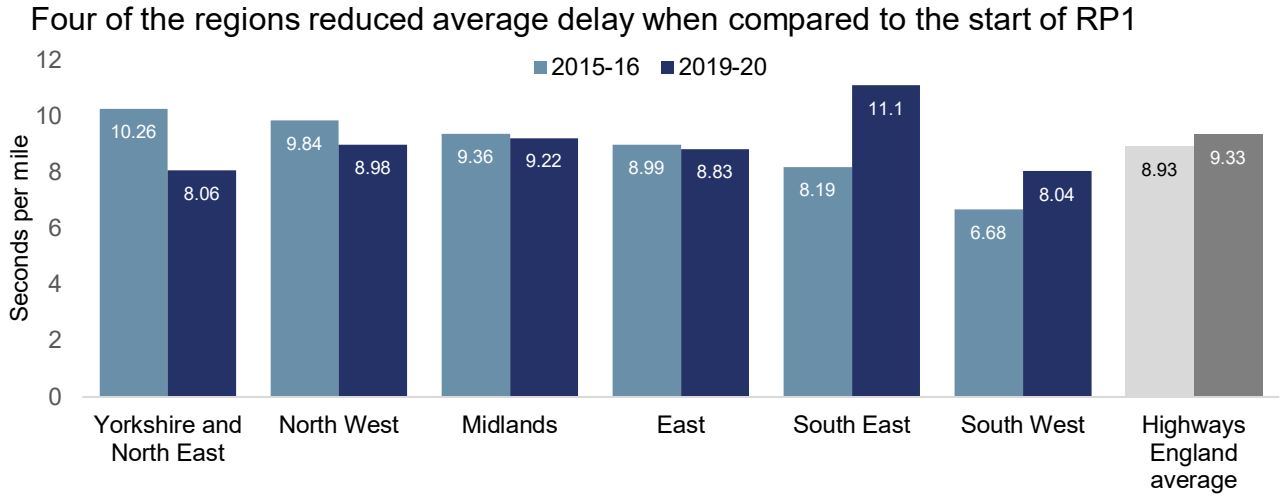
2.20 We are also working with Highways England to improve how it reports maintenance activities like fixing potholes, clearing litter, and inspecting its network. This will provide a richer picture of how Highways England is maintaining the SRN. If such data is made available at a regional level this would help us to benchmark maintenance performance in a more rounded way. Condition data of

this sort would also help us to understand whether differences in spending reveal anything about the relative efficiency of the different regions.

Average delay

2.21 Highways England does not have a national-level target for average delay, it must simply work to minimise delay. Nationally, average delay increased year-on-year in the first four years of RP1. Average delay reached 9.37 seconds per vehicle mile in 2018-19 before improving slightly to 9.33 seconds per mile in 2019-20.

Figure 2.7 Average delay, 2015-16 to 2019-20



2.22 The South East experienced a large increase in average delay during RP1. At the end of RP1 it was the only region with average delay above the Highways England average. The South West was the only other region which experienced an increase in delays during RP1. Yorkshire and the North East achieved a large reduction in average delay of over two seconds per mile. All other regions experienced small reductions in average delay.

2.23 Delays are likely to be strongly influenced by the level of traffic on the network. In this context it is perhaps unsurprising that the South East has both the highest levels of delay and the highest level of traffic density (vehicle miles travelled per lane mile of highway).

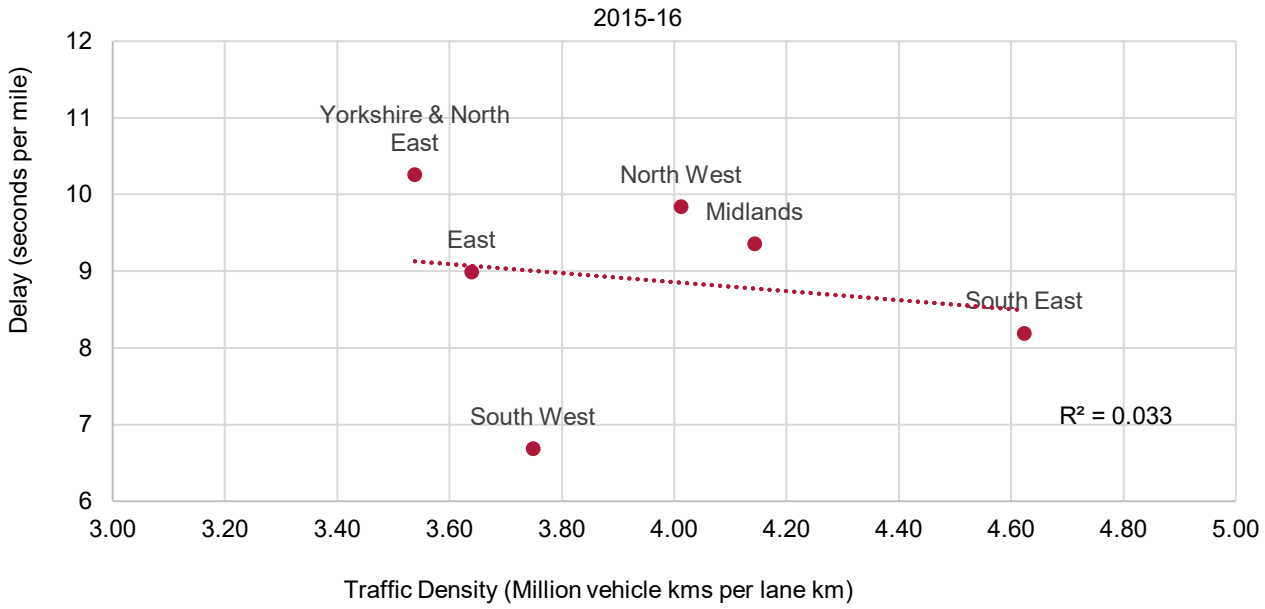
2.24 RP1 coincided with a period of steadily rising traffic on the SRN until the point that the pandemic began to affect travel demand. Across the regions, there was no clear relationship between the *change* in traffic levels and the *change* in the delay metric. However, in 2019-20, there appears to be a strong relationship between

traffic density and delay. This relationship was not apparent in the data at the start of RP1.

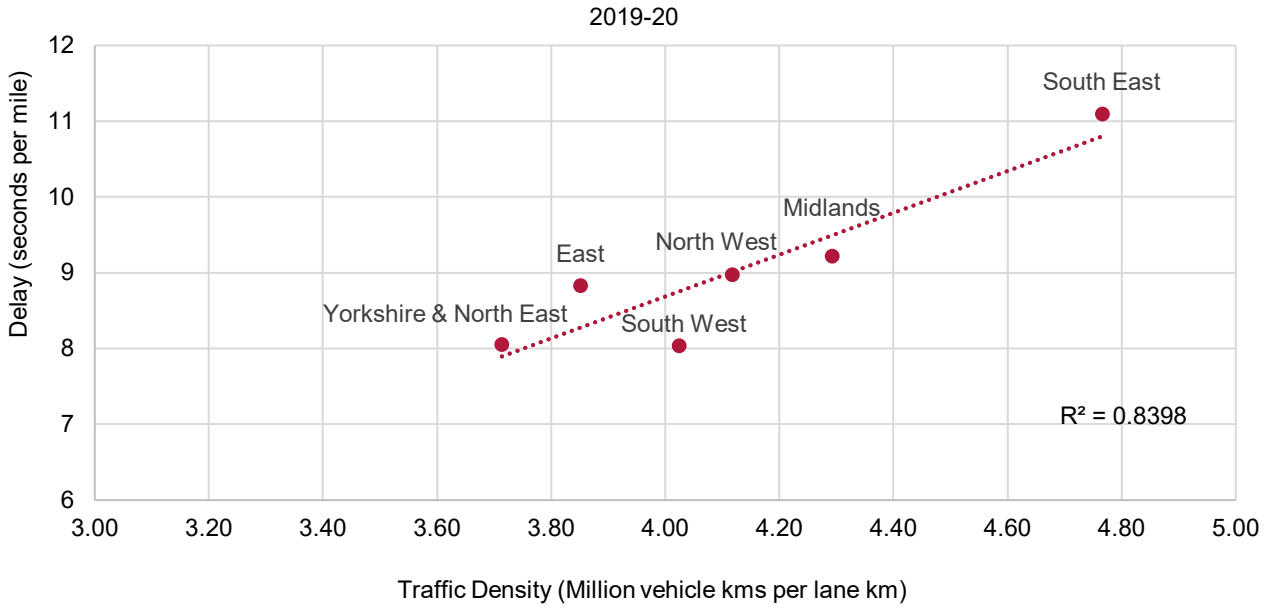
2.25 The impact of roadworks may explain, at least in part, why the relationship between traffic levels and delays have been less evident than we might expect in the past.

Figure 2.8 Average delay vs traffic density, 2015-16 and 2019-20

In 2015-16 there was no obvious relationship between delay and traffic density



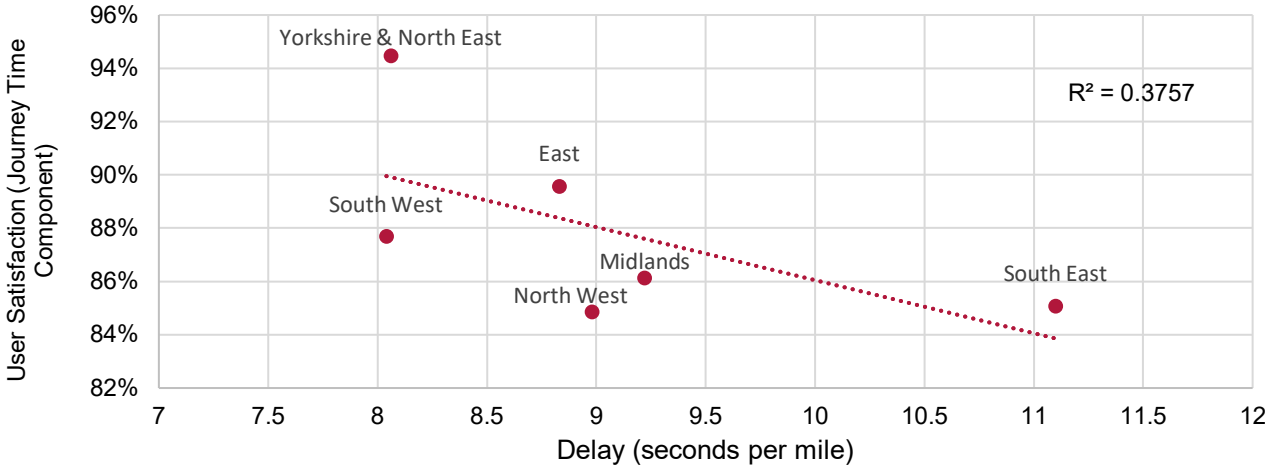
In 2019-20 there was a strong correlation between delay and traffic density



2.26 We know that users' satisfaction with the network is affected by the journey times and delays that they experience on the network. In broad terms, this appears to be borne out by the regional data which shows a negative correlation between the journey time component of user satisfaction and the average delay. In practice, user's perceptions of the quality of their journey is likely to be influenced by both journey times and the reliability of journey times. Highways England's reliability performance indicator is not currently available at a regional level.

Figure 2.9 Satisfaction with journey time vs average delay, 2019-20

Higher delays tend to translate into lower user satisfaction



2.27 In RP2, Highways England will be developing new performance indicators that focus on delays from roadworks and delays on Smart Motorways/All Lane Running Motorways. In respect of reliability, Highways England will be working in collaboration with Transport Focus to develop a new measure which more accurately reflects road users' perceptions of what constitutes a reliable journey.

Network availability and incident clearance

2.28 Network availability and incident clearance are integral to maintaining a smooth flow of traffic. On both measures, Highways England has exceeded the national-level target throughout the RP1.

Network availability

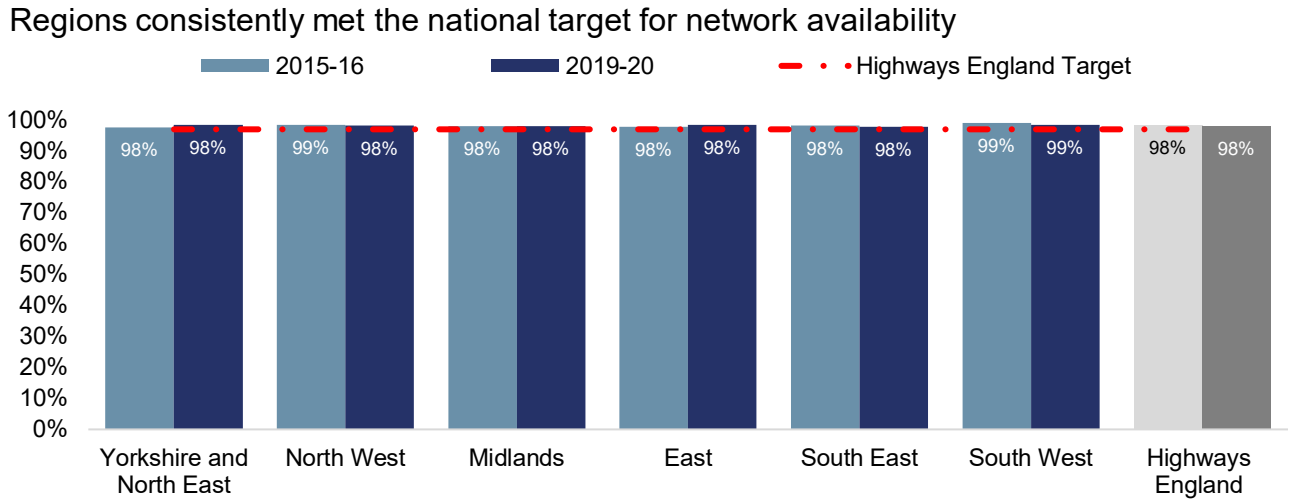
2.29 Highways England has maintained network availability of 98%, one percentage point above its national-level target of 97%. To minimise delays during roadworks, Highways England has instituted measures including increasing roadworks speed

limit to 60 miles per hour, where safe to do so, and completing more roadworks overnight.

2.30 Network availability was consistently good across all regions in RP1. All regions maintained 98% availability from the second year of the road period with the South West maintaining around 99% availability.

2.31 The gap between the regions closed during RP1, although this was partly the result in a slight decline in performance in the South East and South West. Yorkshire and the North East delivered the largest improvement.

Figure 2.10 Percentage of the SRN available to traffic, 2015-16 to 2019-20

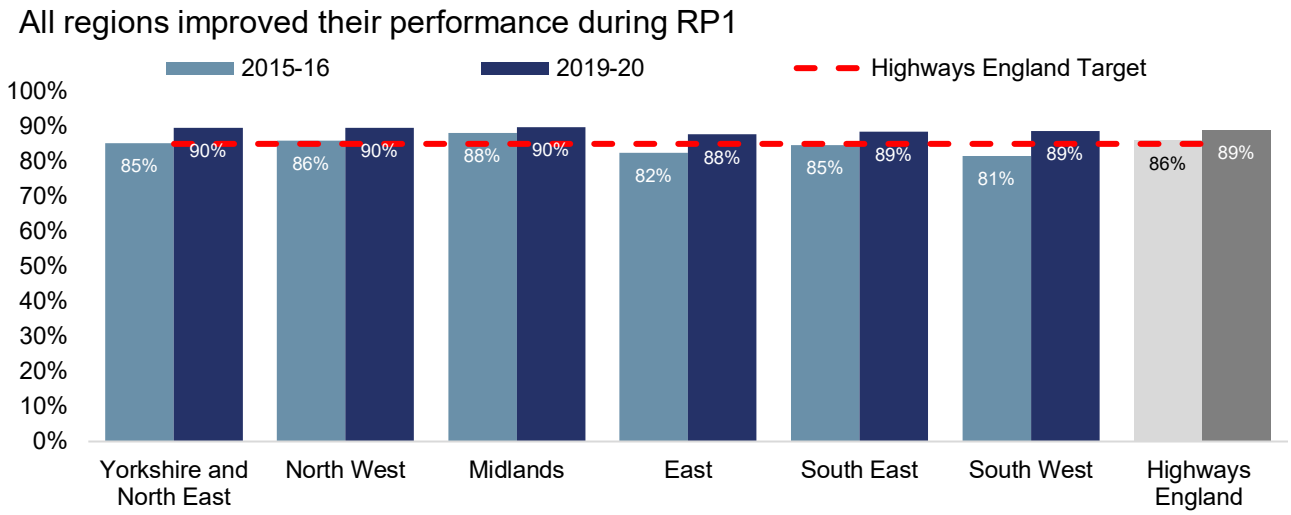


Incident clearance

2.32 The incident clearance KPI measures how long it takes Highways England (working with emergency services) to deal with incidents on the motorway and get traffic moving. As we set out in our Annual Assessment, Highways England took several actions in RP1 to improve its performance in this area. This included setting internal 'stretch' targets for regions, which has improved understanding of the measure, and also created motivation for regions to improve performance.

2.33 Highways England was set a national-level target to clear 85% of motorway incidents within one hour and it met this target in each year of RP1. In 2019-20, Highways England cleared 89% of motorway incidents within an hour, a 3 percentage points improvement from the start of RP1 (86%) and 4 percentage points above its national-level target.

Figure 2.11 Percentage of motorway incidents cleared within one hour, 2015-16 to 2019-20



2.34 All regions significantly improved their performance in respect of the speed of incident clearance. By the end of RP1, all regions were performing above the national-level target with three regions (Yorkshire and the North East, North West and Midlands) recording incident clearance rates above 90%. The largest gains were made in the East and South West which lagged other regions in 2015-16 but now perform at a similar level to the Highways England average. The South West improved from a score of 81% at the start of RP1 to 89% in 2019/20 while the East improved from 82% to 88%.

2.35 The improvement in this KPI achieved by Highways England came largely because of gains achieved by regions, such as the East, which were performing poorly at the start of RP1. This highlights the role that regional comparison can play in improving national performance.

Regional maintenance and renewal spending

2.36 This section compares levels of spending on maintenance (resource) and renewals (capital). To control for the fact that the networks differ in size, we benchmark the regions based on spending per lane mile.

Maintenance

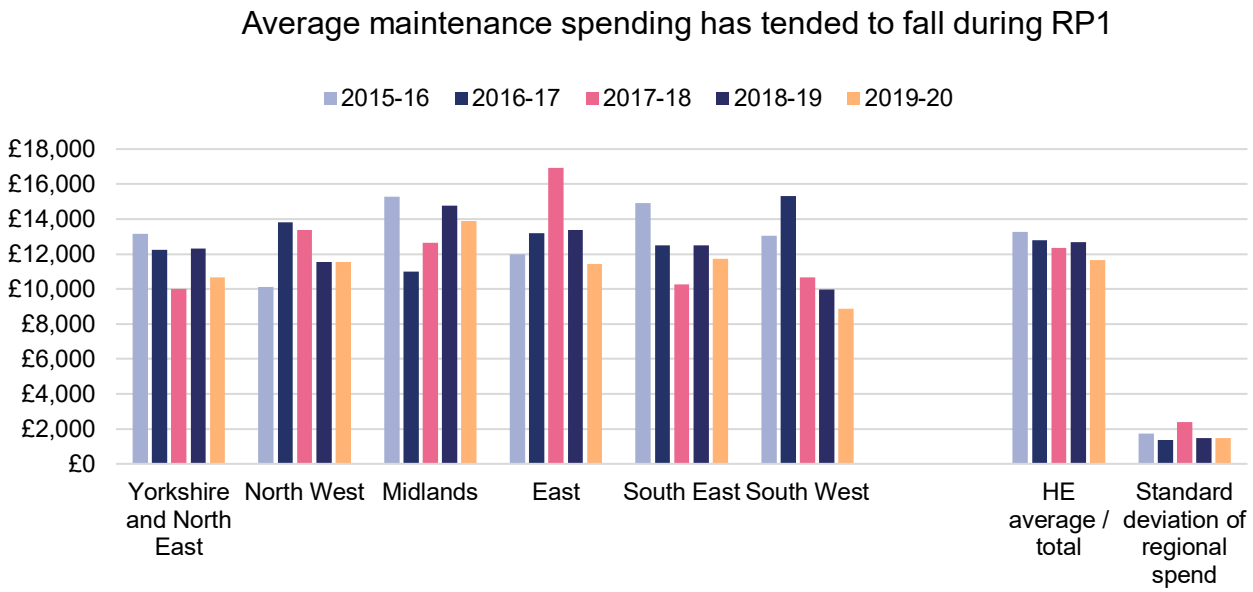
2.37 Over the first road period, there was a gradual reduction in maintenance spending per lane mile in real terms. At a national level, average maintenance spending reduced by 12% to £11,670 per lane mile. The regional picture is more complex

with fluctuations in spending from year-to-year. Nevertheless, except for the North West, all regions spent less in the final year of RP1 than they did in year one.

2.38 Summing expenditures over the five-year period, the Midlands region had the highest average spending per lane mile. It spent 17% more on maintenance than the South West which spent the least per mile.

2.39 Determining whether lower spending is reflective of more efficient delivery would necessitate a more detailed assessment than is possible in this report. It would also require regional cost, output, and condition data than has not been available to date. Improving the quality of such data is a key area of focus for us in RP2.

Figure 2.12 Real average annual spend on maintenance per lane mile, 2015-16 to 2019-20



2.40 During RP1, Highways England has been implementing a new approach to maintaining the network. Under the asset delivery model, Highways England directly manages operations, maintenance, and renewals activities. Where the asset delivery model is in place, we expect to see a clearer link between spending and asset need, and greater transparency regarding differences in spending.

2.41 As this approach becomes embedded, a key question is whether the new model is delivering improved efficiency. It is notable that the South West region (one of the first to move over to the new model in 2017) reduced its spending in each year since 2016-17. However, we cannot establish whether this was the result of improved efficiency without knowing whether the region also reduced the volume of activity, or if lower spending came at the cost of reduced quality of maintenance.

Renewals

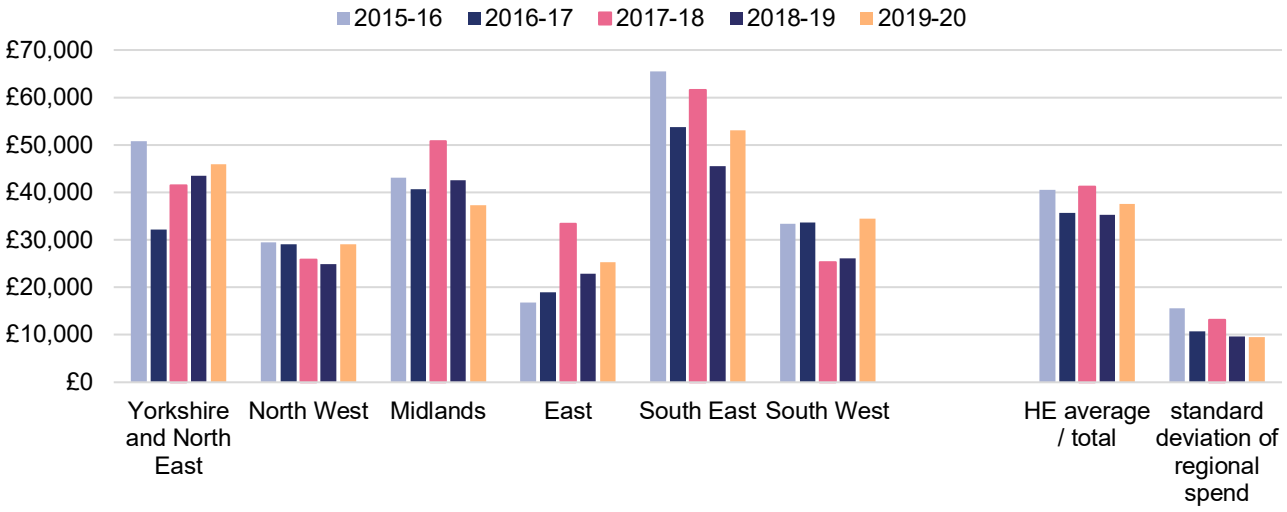
2.42 Comparing the first and last years of RP1, renewals (capital) spending per lane mile[8] decreased slightly in real terms. By its nature spending on renewals fluctuates year-to-year to a much greater extent than maintenance spending, with greater regional variation. Separating out the factors that influence differences in renewals spending, either over time, or across regions is challenging.

2.43 The regional variation in spending on renewals has reduced significantly from a standard deviation of £15,636 in 2015-16 to £9,503 per lane mile at the end of the road period, a 39% decrease. As Highways England moves to a model where renewals spending is more clearly linked to asset need it might be expected that this will be reflected in less regional variation and more stable patterns over time although it is too early to draw any conclusions in this regard.

The annexes provide a regional breakdown including 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 Design, Build, Finance and Operate (DBFO) contracts.

Figure 2.13 Real average annual spend on renewals per lane mile, 2015-16 to 2019-20

There were significant differences in renewals spending across the regions



[8] This analysis excludes spending on major projects.

Benchmarking Safety Performance

2.44 Benchmarking safety performance is complicated by differences in the composition of different road networks, and how different road authorities classify accidents by severity. International comparisons of safety tend to focus on the road network in its entirety. The UK performs consistently well in such comparisons. The Department for Transport's annual road casualty report shows that the UK has one of the lowest fatality rates (road deaths per million inhabitants) when compared with countries from the European Union[9].

2.45 The safety of the SRN, and improvements achieved by Highways England, contribute to this relatively low fatality rate. However, the SRN only accounts for 12% of all road fatalities in Great Britain and therefore network wide comparisons are of limited usefulness for the purposes of benchmarking Highways England's performance.

2.46 Although issues related to differences in road type cannot be eliminated, focusing specifically on motorways enables us to benchmark Highways England's performance against international comparators. Including fatalities ensures that comparisons are not skewed by differences in data collection methods.

2.47 This is a high-level analysis, although there is considerable scope for more detailed comparison of accident and casualty rates if sufficiently detailed data can be sourced from other road authorities.

Safety Performance of Highways England's Motorways

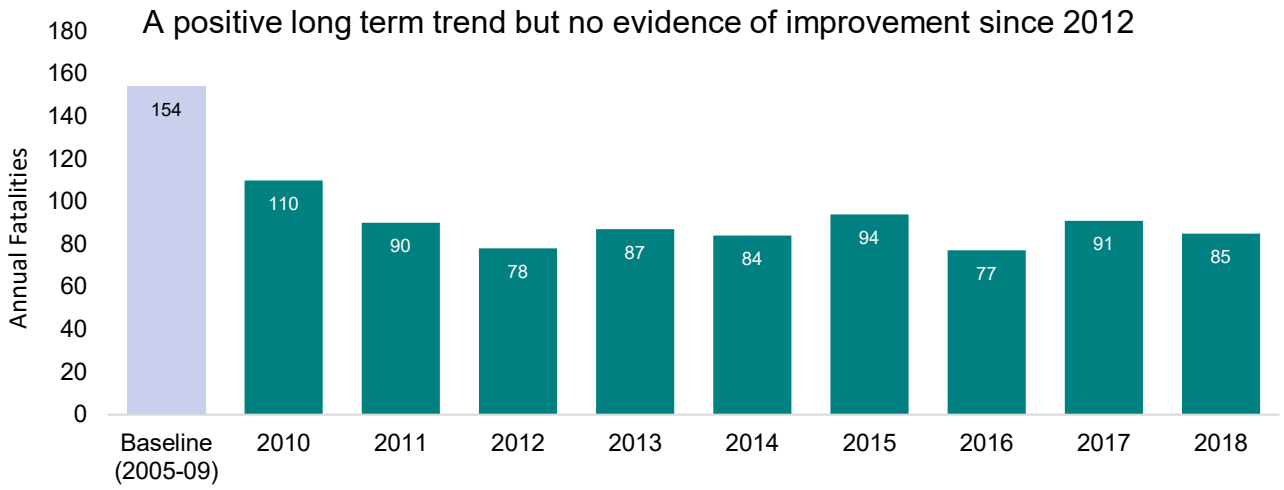
2.48 In respect of safety, we monitor Highways England's performance relative to a 2005 to 2009 baseline. In 2019, the number of deaths on Highways England maintained motorways was 45% below the baseline level of 2005 to 2009. Long term improvements in safety on motorways have outstripped other road types. In 2018, fatalities on Highways England's A-roads were 20% below the 2005-2009 baseline. Fatalities on all roads in England were 36% below the baseline.

2.49 Looking at the trends in more detail, the number of deaths recorded on Highways England maintained motorways fell sharply between 2005 and 2012. In

[9] https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-annual-report-2019

subsequent years, the number of deaths of motorways has fluctuated without any further reductions achieved. This is in line with trend on all roads in Great Britain.

Figure 2.14 Fatalities on the motorway network in England, 2018



International Comparison – Trends

2.50 A long-term trend of improved road safety is evident in most countries. Factors include technological improvements to the safety of vehicles, improved education and training, a reduction in drink driving, and changes in the age profile of drivers. Notwithstanding these trends, fatality rates for different countries suggest that there are large differences in road safety performance and year-on-year reductions in fatalities are far from guaranteed.

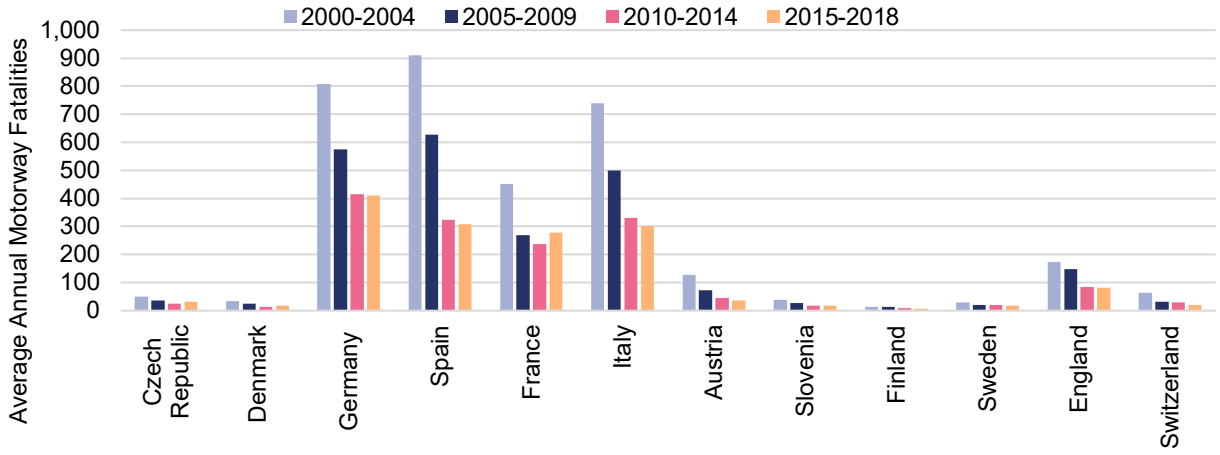
2.51 We have compared Highways England's motorways with the motorway networks of a selection of European countries based on the availability of data and the similarity of the networks. Of the 11 comparators we have selected, seven are amongst the 'top-12' potential comparators that we identified in 2016 as having similar characteristics to the UK[10]. Trends in total fatalities have been compared which fails to control for changes in traffic levels or network size, although each of these typically changes by relatively small amounts from year-to-year[11].

[10] These are Denmark, Germany, Spain, France, Italy, Austria, and Finland. As set out in https://www.orr.gov.uk/sites/default/files/om/benchmarking-highways-England-performance-2016-progress-report.pdf

[11] Data for England is taken from the Department for Transport's Road Safety Data Download Tool and relates to fatalities on Motorways in England. Data is provided for the year 2000 onwards and therefore provides a longer time series than data published by Highways England. It should be noted that the precise numbers of fatalities given in the Department for Transport dataset differs to that published for the SRN and against which Highways England's performance is monitored.

Figure 2.15 Trends in fatalities on motorways – international comparison

Most countries have failed to sustain reductions in motorway fatalities in recent years



2.52 There are striking similarities in the trends experienced since 2000. In most cases, large reductions in motorway deaths occurred between 2000-05 and 2010-14. Since the early part of the last decade the number of deaths has flattened out.

To bring the comparator countries in line with the way we monitor Highways England's performance, we have also measured the change in fatalities relative to a 2005 to 2009 baseline. On this measure, England compares favorably, achieving a 45% reduction by 2018 compared with a sample average of 31%[12]. Only Sweden experienced more deaths in 2018 than its average level between 2005 and 2009.

[12] Unweighted average calculated based on all countries including England.

Table 2.2 Percentage change in motorway fatalities since 2005-09[13]

Country	2005-09 Average	% Change on Baseline	
		2015	2018
Austria	74	-44%	-62%
Finland	12	-52%	-60%
Spain	626	-56%	-48%
Slovenia	27	-44%	-47%
England	154	-40%	-45%
Switzerland	33	-36%	-42%
Italy	499	-39%	-34%
Germany	576	-28%	-26%
Denmark	25	-37%	-17%
Czech Republic	37	-16%	-5%
France	269	10%	0%
Sweden	20	-26%	19%

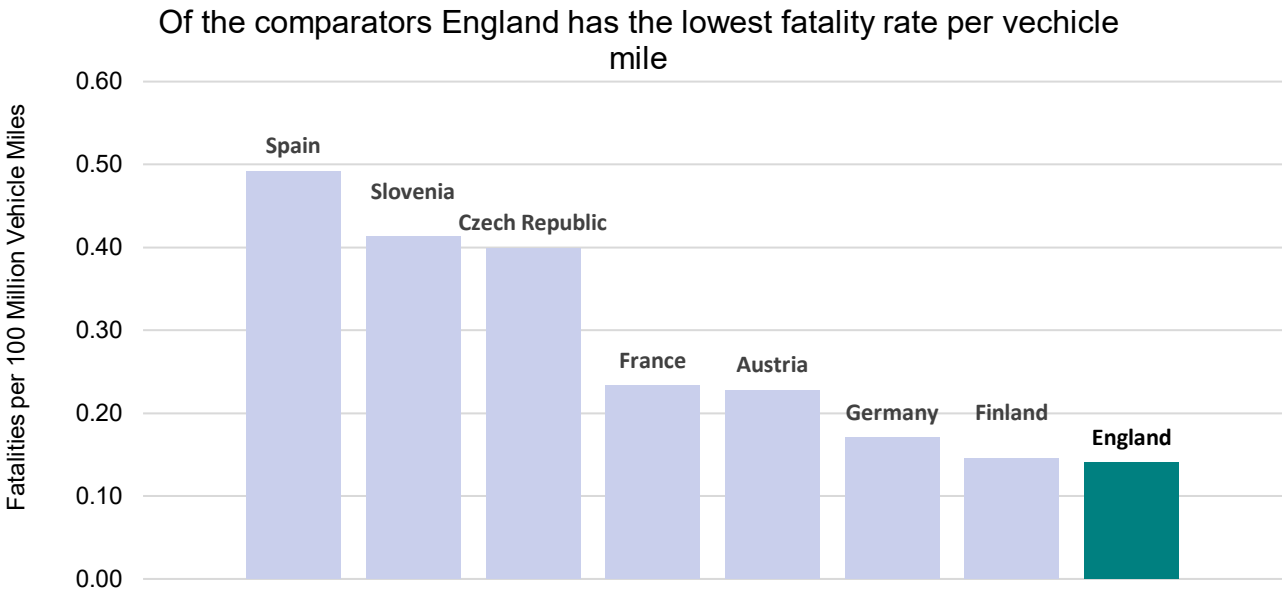
International Comparison – Fatality Rates

2.53 Achieving further reductions in motorway fatalities is likely to be relatively more challenging in England given that the network is already considered to be amongst the safest in the world.

2.54 Where data availability allows, we have compared the *rate* of fatalities experienced on the different networks. Of the eight countries compared, England's motorways have the lowest level of fatalities per vehicle mile. This may be partly a consequence of the density of traffic on England's motorways which results in traffic travelling at lower speeds due to congestion for longer periods of time. Nevertheless, the differences between the best and worst performing networks are large.

[13] Numbers rounded to nearest integer. Data sourced from Eurostat excluding England sourced from Highways England's Road Casualties Report

Figure 2.16 Fatality rates – international comparison (latest available year between 2016 and 2018)



2.55 This is not to say that further reductions in fatalities are not possible. Highways England has a long-term goal of zero casualties on the SRN by 2040. As we set out in our Annual Assessment, Highways England must continue to work hard to reduce the number of people killed or seriously injured on its roads.

Targeted Benchmarking Activities

3.1 In addition to our regional performance benchmarking, we have undertaken a range of targeted investigations during RP1. These studies have furthered our understanding of Highways England's performance and we used their findings to inform our assessment of Highways England's investment plans for RP2 (the RIS2 efficiency review).

3.2 We have also progressed several feasibility studies to enhance our benchmarking capabilities and identify the benchmarking activities that will have greatest impact in RP2 and beyond. In some areas – notably international comparison – we have encountered barriers to developing comparable measures of performance and efficiency. Nevertheless, there are other areas which offer much greater potential including benchmarking pavement condition and comparing the efficiency of Highways England's regions in respect of operations and maintenance.

Operating efficiency

3.3 In 2017 we commissioned an analysis of the Efficiency of Highways England's Operating Expenditure. The purpose of this study was to evaluate the evidence of efficiency gains achieved up to the early part of RP1 but also consider the level of efficiency that might be expected during the remainder of RP1 and during RP2. The study drew on evidence from a selection of comparator sectors including airports, water, rail and energy. It focussed on the performance of these sectors in the periods following privatisation. The study informed our approach to the RIS2 efficiency review.

3.4 The study highlighted several methodological challenges when benchmarking efficiency using expenditure data, not least the difficulty of separating out changes in efficiency from changes in the scope of activities undertaken and outputs delivered. Where Highways England had achieved cost reductions in the period prior to RP1 it was not possible to determine how much of this improvement was the product of efficiency gains. As set out later in this report, developing better methods with which to measure and benchmark operating efficiency is an area we are continuing to explore with Highways England.

Traffic delays

3.5 We published a comparative analysis of traffic delays on the SRN. Traffic and delay data were gathered for 13 European countries. For each country, road links were selected which exhibited similar characteristics to the SRN. Two delay

metrics were then developed to allow consistent comparison: the average delay per vehicle mile and the percentage of hours in which delays are experienced.

3.6 The study found that the proportion of hours during which delays were experienced on the SRN was close to the average for the sample of comparators. However, delays on the SRN were far more concentrated than was the case for the comparators, with larger differences between peak and off-peak travel times. Only one comparator (Germany) showed a higher overall level of delay (average delay per vehicle mile). Reliance on single carriageways and the comparatively limited coverage of tolled roads were identified as two likely explanations. The study highlighted that, because of such differences, network wide benchmarking of journey times does not provide a basis upon which targets for delay or reliability on the SRN could be set.

Roadworks management

3.7 We commissioned a study to better understand Highways England's approach to Roadworks Management. Highways England's approach was compared against a combination of international highways authorities, local authorities and other UK infrastructure authorities. The report highlighted that Highways England has key strengths in roadwork management, particularly in respect to its approach to roadwork design, scheduling and communication. It was also praised for its emphasis on continuous improvement. The report made recommendations for potential improvement across all aspects of roadworks management. These included placing greater focus on customer experience and improved performance management practices, particularly in respect of monitoring actual performance against planned objectives. Highways England acted on a number of these recommendations in its customer service improvement plans.

Incident management

3.8 In 2018, we commissioned an assessment of Highways England's Incident Management practices. The study provided a snapshot of Highways England's processes, the way it measures and monitors performance, and its approach to continuous improvement. Highways England's approaches were then compared with other UK highways authorities, UK non-highways infrastructure managers and international highways authorities.

3.9 The study found Highways England to be a European leader in incident management and identified two international benchmarking studies that had identified Highways England and the Netherlands as being the best in Europe. Nevertheless, the study also identified areas for potential improvement including

more standardisation across its regions, improved stakeholder liaison and rolling out examples of innovation and best practice.

Pavement condition and costs

3.10 We have investigated the feasibility of benchmarking the condition of the SRN through two studies during RP1. This work has looked at pavement condition data and metrics employed by different highways authorities. It suggests that it will be possible to compare pavement condition across different networks although such an exercise would not be without its limitations.

3.11 The research has focussed on pavement condition data collected by English Local Authorities, the Welsh and Scottish Governments, and the Netherlands. It is likely that a pavement condition metric could be constructed which might allow comparison of a subset of networks, although any such metric will differ from that currently used by Highways England. It would be important to ensure that an adjusted metric remains a useful indicator of condition. Establishing such a benchmark would provide an improved basis on which we can assess Highways England's performance and advise the Department for Transport on the targets that should be set for the pavement condition KPI. The analysis could also be expanded to allow us to get more insight into relative efficiency by comparing expenditures on road surface maintenance and the outputs achieved.

3.12 Our plans for further development of this work during RP2 are set out in later in this report.

Capital efficiency

3.13 In 2018, we investigated options for benchmarking Highways England's Capital Efficiency. The findings of this work informed our approach to the RIS2 efficiency review but is also shaping our approach to benchmarking on an ongoing basis.

3.14 This work considered the effectiveness of benchmarking against international comparators, benchmarking against other highways authorities in the UK, and internal benchmarking of Highways England's regions. It concluded that internal benchmarking is likely to represent the most feasible option.

3.15 Benchmarking capital efficiency is challenging. This is because capital projects vary widely in size and scope but also because expenditure is subject to much larger fluctuations from year-to-year. Nevertheless, analysing the costs and outputs of capital projects can shed light on the factors that influence project costs. Additionally, whilst there are technical challenges to doing so, tracking this data

over time may provide an indication of whether expected efficiency improvements are being achieved. This is an area we are continuing to explore in RP2.

3.16 In the rail sector, benchmarking plays a useful role in the way that we report on Network Rail's delivery of enhancements. In this case, we have access to a database of historical project costs against which we can compare the cost estimates for forthcoming projects.

Ongoing activities

Overview

4.1 In last year's progress report we set out our high-level plans for benchmarking activities in road period 2. These are based around the three pillars of:

- Regional or internal benchmarking.
- Developing better evidence on pavement (road surface) costs and condition; and
- Targeted analysis of other sectors and countries.

Regional or internal benchmarking

4.2 As described earlier in this report, we want to broaden the role that regional benchmarking plays in monitoring Highways England's performance. In RP2, we will be discussing with Highways England the effort needed to expand the range of indicators that are reported at regional level.

4.3 We also recognise that regional analysis would benefit from a more detailed understanding of the regional context. Variation across regions may be explained by differences in network characteristics, particular circumstances faced by a region, or differences in approach or performance. The more we can do to separate out these factors, the more insight we will gain.

4.4 We will also require Highways England to provide better cost and spending data at regional level in respect of operations, maintenance, and renewals.

4.5 Econometric approaches to cost benchmarking can be used to make better comparisons across regions or authorities by controlling for a range of observable cost drivers such as network composition, road condition and traffic levels. Analysing differences in expenditure that cannot be explained by these cost drivers can provide a better basis for benchmarking efficiency both across regions and over time. A similar approach is already being used by our rail colleagues as part of our monitoring of Network Rail, although we acknowledge this has taken some time to develop and continues to evolve.

4.6 An example of this approach to benchmarking is already being used in the roads sector in the UK. The CQC Efficiency Network (developed by the National

Highways and Transport Network) benchmarks maintenance spending of over 80 UK local authorities. The econometric model – built and maintained by the Institute for Transport Studies at the University of Leeds – adjusts for differences in network size, traffic volumes, local wage rates and road conditions. A key advantage of the CQC approach is that it also makes allowance for effects of additional investment or disinvestment in the condition of the network. This ensures that authorities do not appear to be less efficient where they make long-term investments that improve the quality of the network.

4.7 Working with the Institute for Transport Studies, we plan to undertake a more detailed review of the CQC Network cost models and to explore the compatibility of cost, and cost driver, data collated by local authorities and Highways England. It will be important to ensure that differences in the network characteristics are considered when making comparisons.

4.8 We recognise that developing such models is challenging and will take time. Nevertheless, in the near-term, we would like to put the building blocks in place by collating more consistent and disaggregated time series data for Highways England's regions and areas with respect to maintenance and renewals spending and outputs.

Pavement condition and costs

4.9 Building on the feasibility studies already described, we plan to commission a detailed study to benchmark the condition of the SRN against a selection of comparator networks. This work will establish a pavement condition metric that will allow like-for-like comparisons to be made. As well as using an overall metric it is likely to compare specific aspects of condition (components of the overarching metric) such as skid resistance and ride quality.

4.10 Our 2019 feasibility study set out a range of options that we could pursue in respect of the comparator authorities we benchmark against and the form of pavement condition metric that we use. As a first step, we are undertaking more detailed work to better understand the availability and compatibility of pavement condition data for English local roads authorities. We will also be engaging with potential comparator authorities to secure their participation in the study.

Targeted analysis

4.11 Although we are still in the first year of RP2, we are already turning our attention to RP3 and planning for the efficiency review of the third Road Investment Strategy

(RIS3). As set out in this report, during RP1 we undertook a range of targeted activities that were focussed on informing our review of Highways England's Draft Strategic Business Plan and the efficiency review.

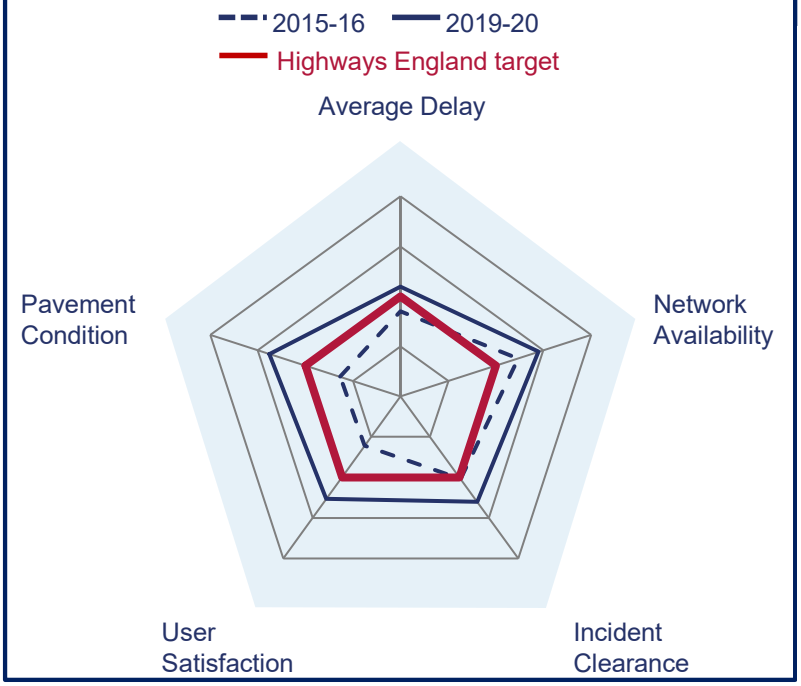
4.12 During 2021, drawing on the lessons learnt in RP1, we will be developing our approach to the RIS3 efficiency review. As part of this, we will need to identify the underpinning evidence which will be needed to help us assess Highways England's plans. This will determine our priorities for targeted analysis during RP2.

Annex A – Regional dashboards

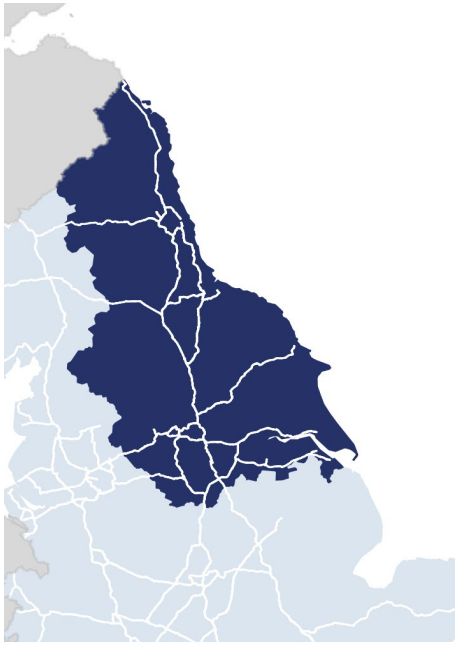
We have compiled regional dashboards that combine data on performance, spending and contextual factors. They compare performance and spending between the start and end of RP1. The dashboards show:

- performance, made up of the five KPIs - radar charts have been designed such that a larger shape represents ‘good’ performance for each of the KPIs;
- regional statistics include the gross value added (GVA) per head, 2018, regional population, network structure and length in lane miles;
- road length as a percentage broken down by motorway, single and dual carriageways of the total route miles in the region;
- spending, covering maintenance and renewal spend per lane mile; and
- traffic volumes, shown as the traffic density (average annual daily traffic flows for motorways, dual carriageways and single carriageways) and the percentage of heavy goods vehicle (HGV) traffic.

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



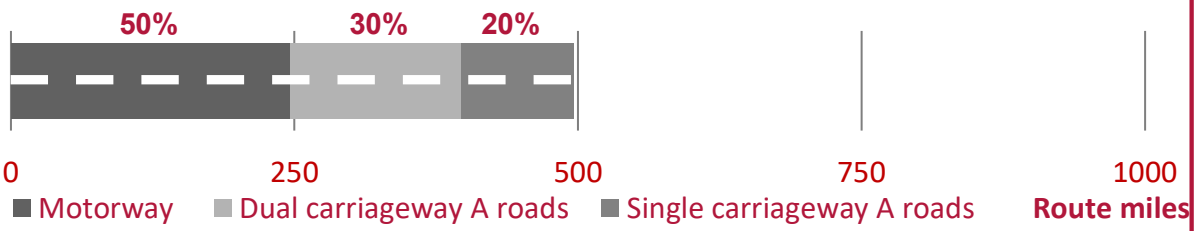
Yorkshire & North East



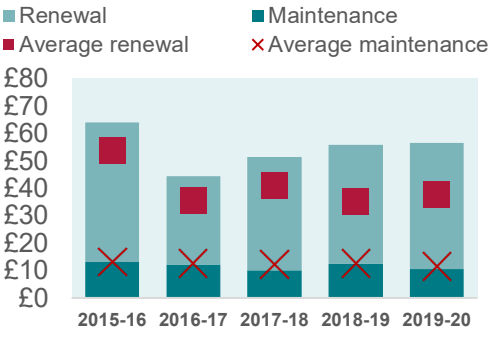
Regional

- 8.2m population
- £22,000 GVA per head
- 2,606 structures
- 2,516 lane miles

Road length measured in route miles 2019-20

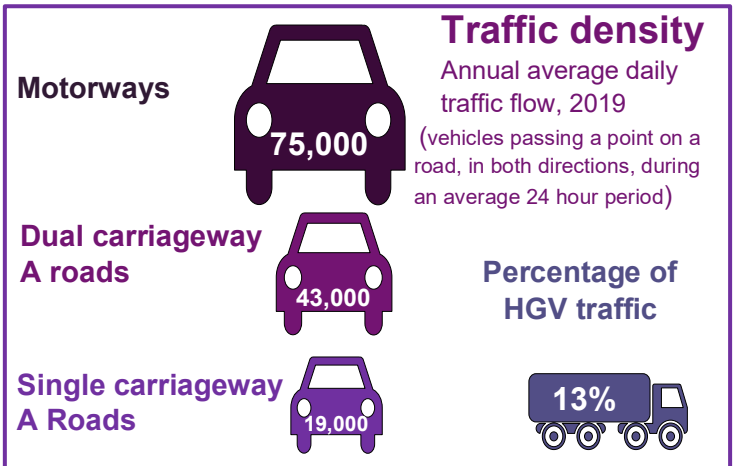


Spending per lane mile, 2015-16 to 2019-20 (£000s)

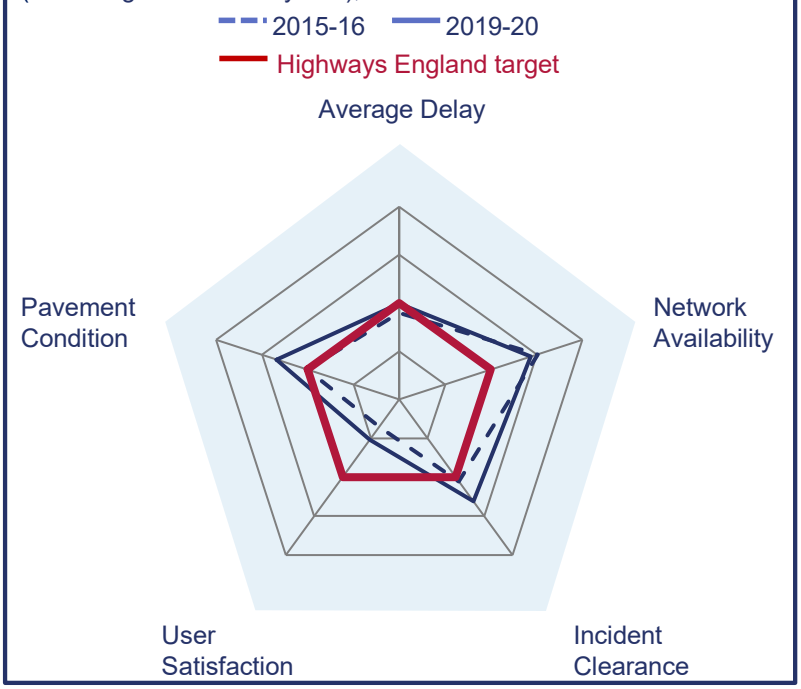


Traffic density

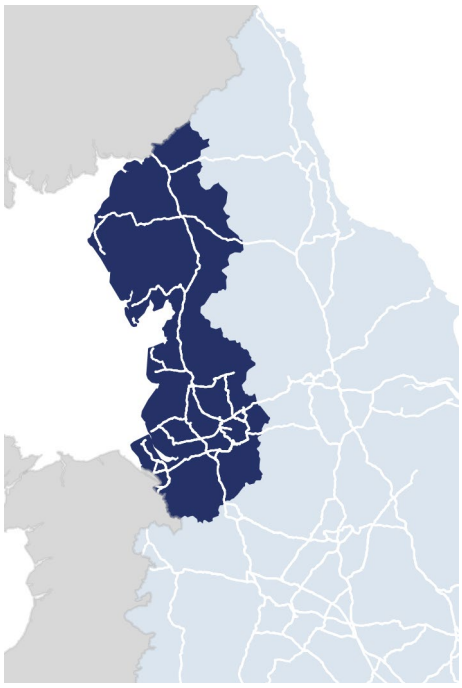
Annual average daily traffic flow, 2019 (vehicles passing a point on a road, in both directions, during an average 24 hour period)



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



North West



Regional stats

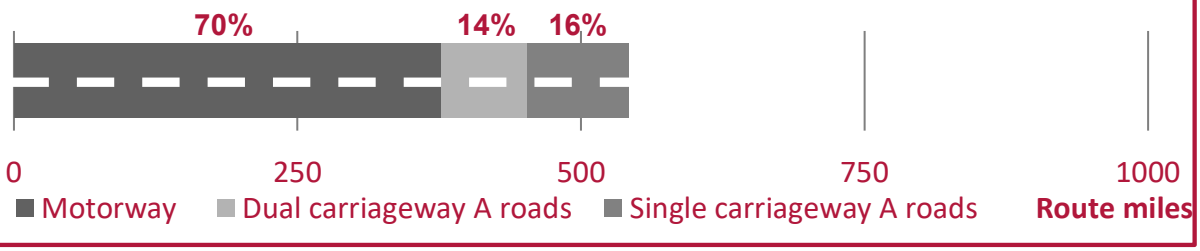
7.3m population

£25,000 GVA per head

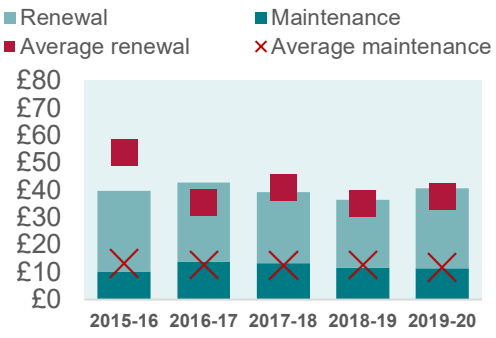
3,077 structures

3,184 lane miles

Road length measured in route miles 2019-20



Spending per lane mile, 2015-16 to 2019-20 (£000s)



Traffic density

Annual average daily traffic flow, 2019 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

Motorways 87,000

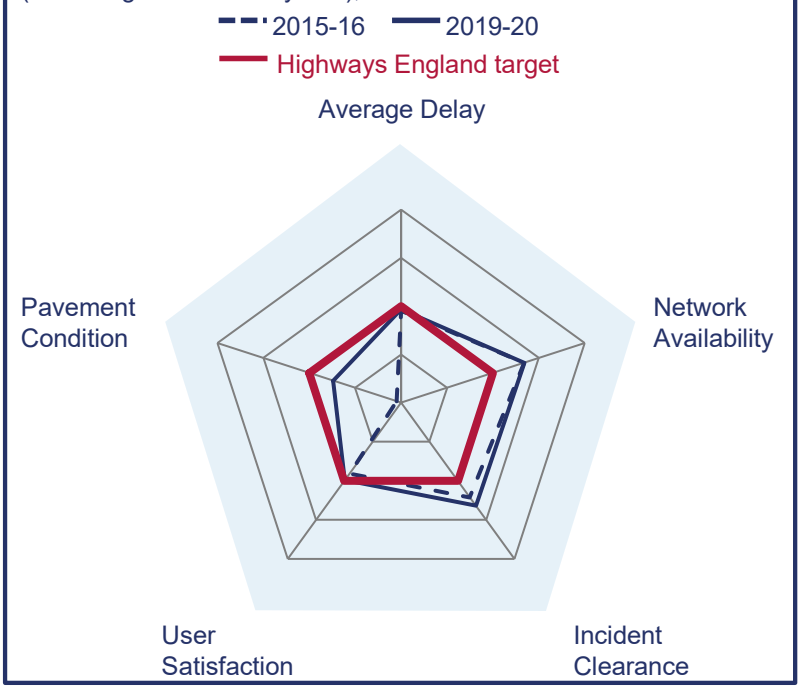
Dual carriageway A roads 33,000

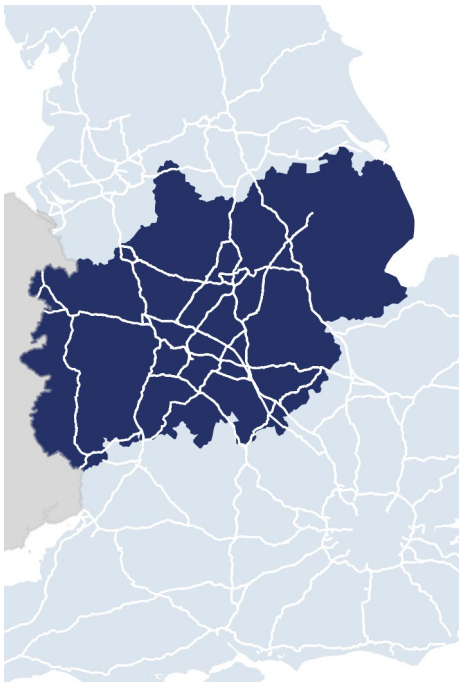
Single carriageway A Roads 20,000

Percentage of HGV traffic 10%

Midlands

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





Regional stats

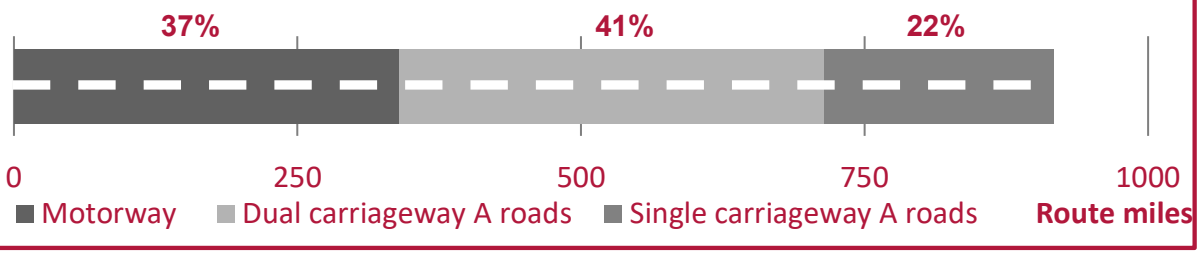
10.8m population

£23,500 GVA per head

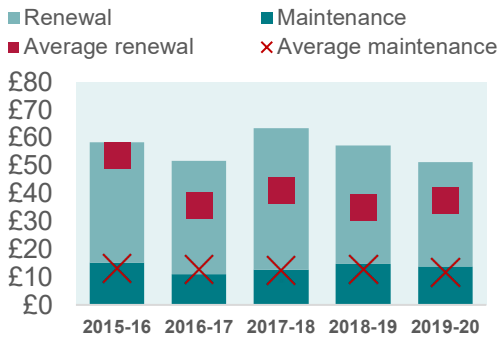
5,327 structures

4,543 lane miles

Road length measured in route miles 2019-20



Spending per lane mile, 2015-16 to 2019-20 (£000s)



Traffic density

Annual average daily traffic flow, 2019 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

Motorways 97,000

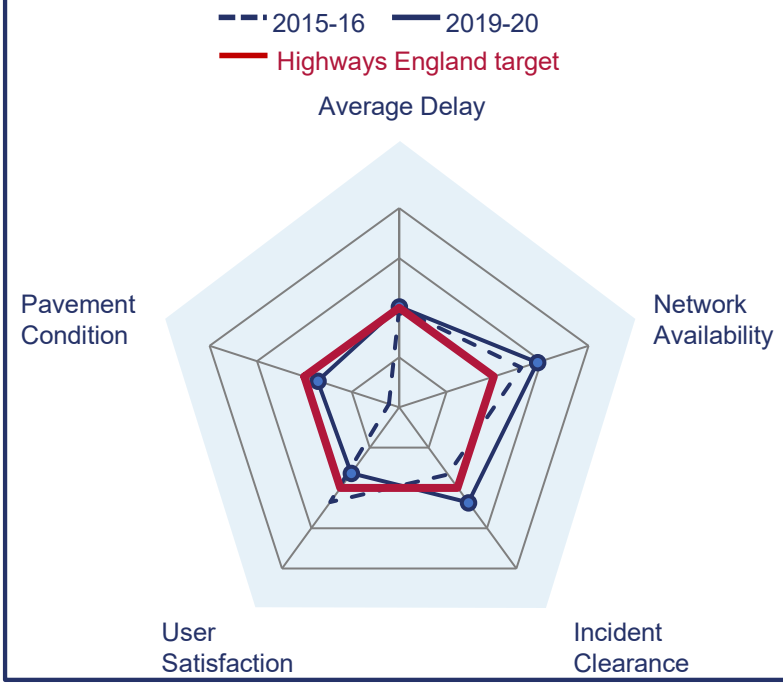
Dual carriageway A roads 42,000

Single carriageway A Roads 31,000

Percentage of HGV traffic 13%

East

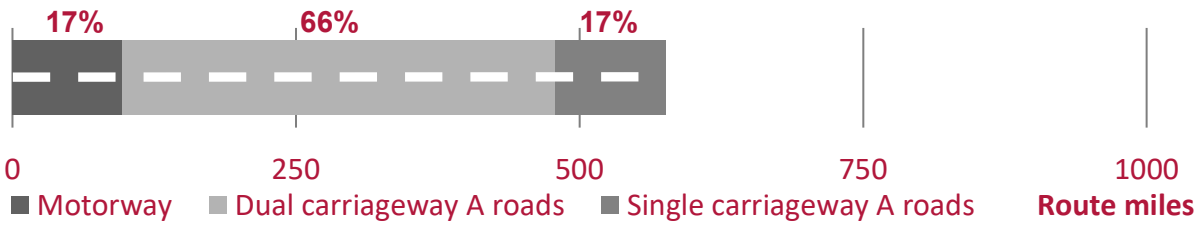
Performance relative to Highways England's target (or average for the delay KPI),



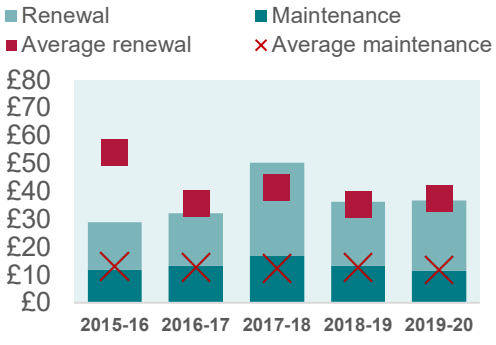
Regional stats

- 6.2m population
- £20,554 GVA per head
- 2,142 structures
- 2,641 lane miles

Road length measured in route miles 2019-20



Spending per lane mile, 2015-16 to 2019-20 (£000s)



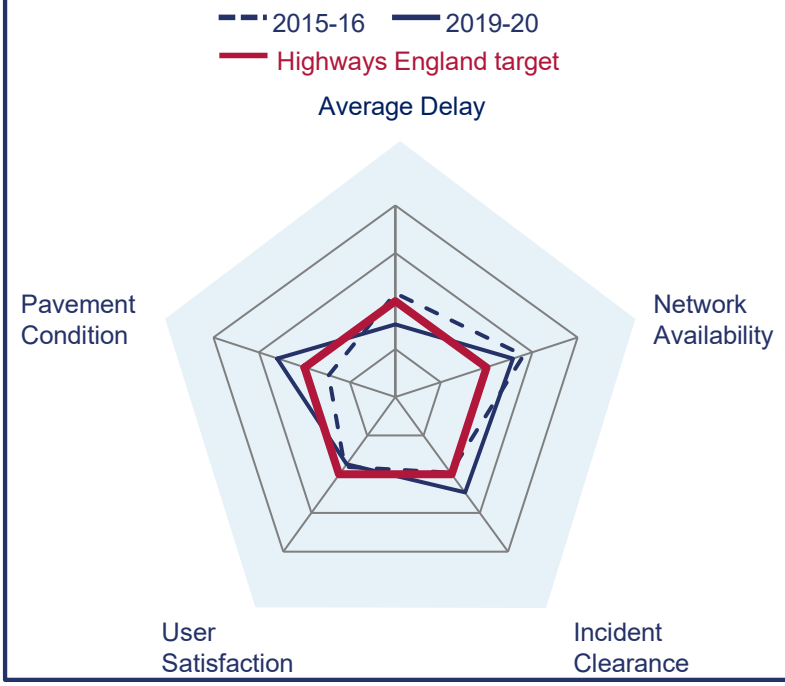
Traffic density

Annual average daily traffic flow, 2019 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

Percentage of HGV traffic

South East

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



Regional stats

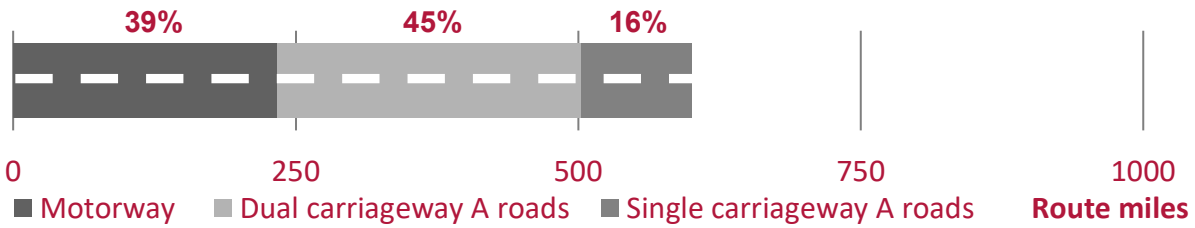
9.2m population

£30,250 GVA per head

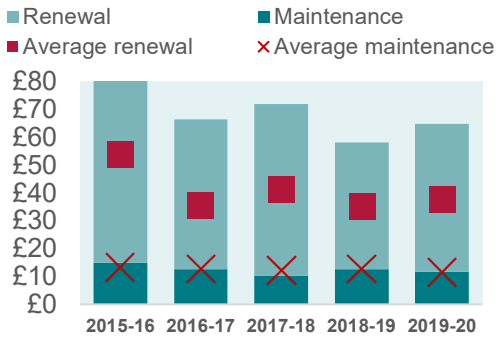
2,645 structures

3,094 lane miles

Road length measured in route miles 2019-20



Spending per lane mile, 2015-16 to 2019-20 (£000s)



Traffic density

Annual average daily traffic flow, 2019 (vehicles passing a point on a road, in both directions, during an average 24 hour period)

Motorways 97,000

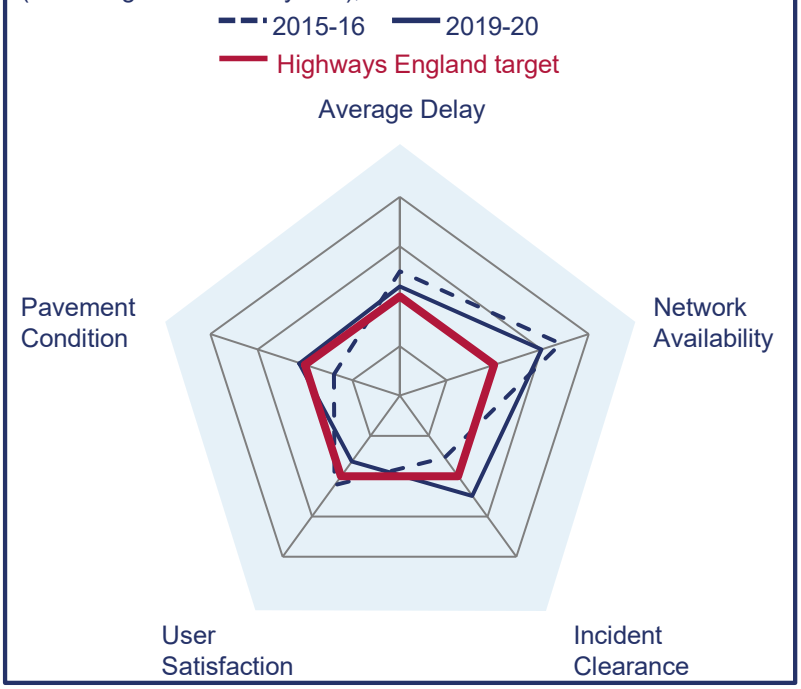
Dual carriageway A roads 58,000

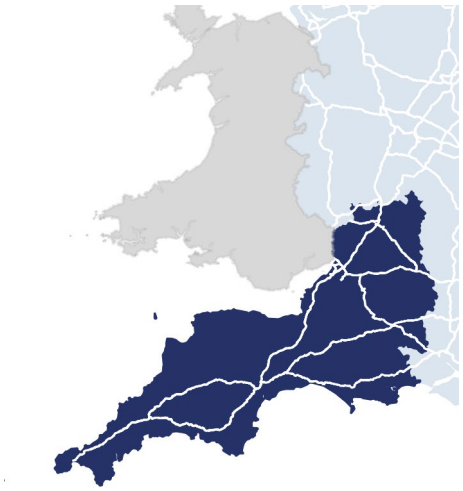
Single carriageway A Roads 21,000

Percentage of HGV traffic 8%

South West

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





Regional stats

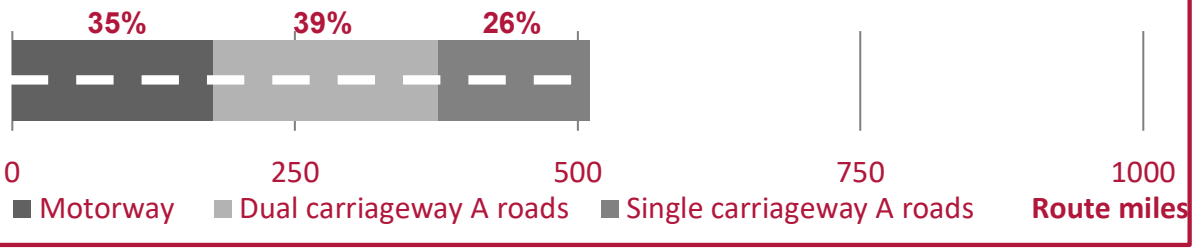
5.6m population

£25,000 GVA per head

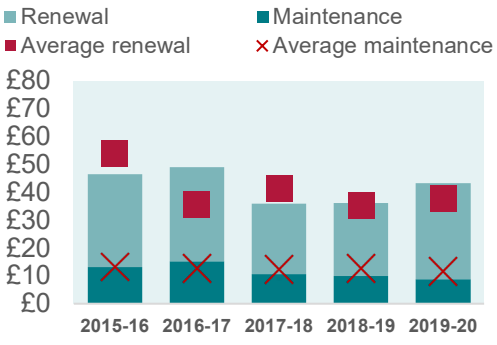
2,019 structures

2,360 lane miles

Road length measured in route miles 2019-20



Spending per lane mile, 2015-16 to 2019-20 (£000s)



Traffic density

Annual average daily traffic flow, 2019

(vehicles passing a point on a road, in both directions, during an average 24 hour period)

Percentage of HGV traffic

Annex B – Methods and data sources

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 31st 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 set
Keeping the network in good condition	Percentage of the pavement not requiring further investigation for maintenance	>95% of pavement not requiring further investigation

Treatment of DBFO-managed sections of the network

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.[14] More detail on which parts of the network fall into each region, and which are managed by DBFO operators, can be found here[15].

Regional stats, road length, spending and traffic

Population

Regional population estimates for mid-2018 were sourced from the ONS and are rounded to nearest 100,000 in the dashboards[16].

GVA per head

Gross value added (GVA) data for 2018 were sourced from the ONS; divided by regional population to give GVA per head; and are rounded to the nearest £250 in the dashboards: In this report, GVA(I) which we used in our previous report has now been superseded by GVA(B). The new measure, GVA (B) is a balanced measure of estimates from gross value added income (GVA (I)) and gross value added production (GVA (P))[17].

[14] 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.

[15] https://www.gov.uk/government/publications/roads-managed-by-highways-england

[16] https://www.ons.gov.uk/peoplepopulationandcommunity

[17] https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalregionalgrossvalueaddedbalancedperheadandincomecomponents

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:

- 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 2019.

Spending

Maintenance and renewal spending data were sourced from statements F2.1 and F3.1 of Highways England's 2018-19 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:

Traffic

Traffic data are for 2018 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 kilometers in 2018 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 2018. The percentage of HGV traffic is the proportion of HGV miles in total vehicle miles.

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