Department for Transport

Travel time measures for the Strategic Road Network and local 'A' roads, England: January to December 2019

About this release

This statistical release presents information about travel times on Strategic Road Network (roads managed by Highways England) and Local Highway Authority managed 'A' roads in England. The measures in this release are estimated using in-vehicle Global Positioning Systems. (GPS) observation.

In this publication

In 2019, average delay on the Strategic Road Network increased by 0.1 seconds per vehicle per mile (up 0.9%), and average delay on local 'A' roads increased by 0.8 seconds per vehicle per mile (1.8%).

Key Statistics

On the Strategic Road Network (SRN) in 2019:

- The **average delay** is estimated to be **9.5 seconds per vehicle per mile compared to speed limits**, a 0.9% increase on the previous year.
- The **average speed was 58.8 mph**, down 0.5% from 2018.
- Reliability of travel times is measured using the Planning Time Index. This shows **67.3% of additional time is needed compared to speed limits**, on average, on individual roads sections to ensure on time arrival. This is up 1.1 percentage points compared to 2018.

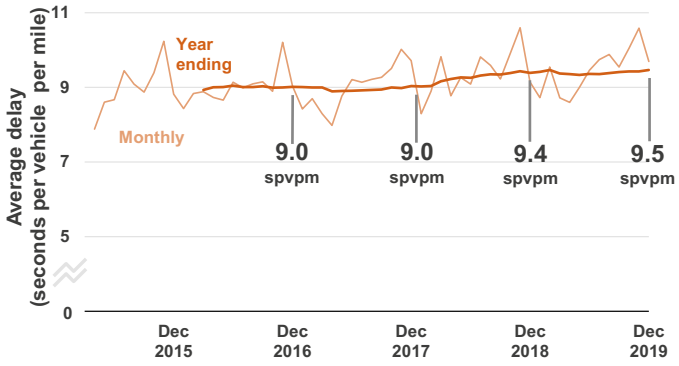

Figure 1: Average delay, compared to speed limits, on the Strategic Road Network (Table CGN0402a)

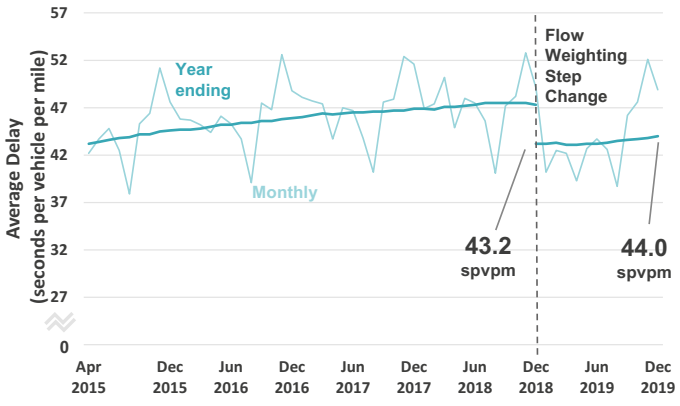

Figure 2: Average delay, compared to free flow, on local 'A' roads (Table CGN0502a)

On Local 'A' Roads in 2019:

- The **average delay** is estimated to be **44.0 seconds per vehicle per mile compared to free flow,** up 1.8% compared to 2018.
- The **average speed was 25.3 mph**, no change compared to the previous year.

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Definitions

Average speed is in miles per hour and is an estimate of the physical level of congestion.

Free flow speed is the estimated speed of the traffic if there was no congestion. This is calculated differently for SRN and local 'A' roads.

Average delay is the difference between speed limit (SRN) or free flow (local 'A' roads) travel times and average journey times.

LCV - Light Commercial Vehicles

Strategic Road Network, in 2019

Average delay

seconds per vehicle per mile

9.5 spvpm

0.1 spvpm
0.9% increase on 2018

Average speed

miles per hour (mph)

58.8 mph

0.2 mph
0.5% decrease on 2018

Reliability

67.3%
additional time is needed compared to speed limit flow

down 1.1 percentage points on 2018

Sample

100 % cars

Monthly average, over 30,000 cars

Local 'A' Roads, in 2019

Average speed

miles per hour (mph)

25.3 mph

⇔ 0.0 mph
no change on 2018 figure

Sample

66% | 34%

Monthly average, over 115,000 cars and LCVs

Average delay

seconds per vehicle per mile (spvpm)

44.0 spvpm

0.8 spvpm
1.8% increase on 2018

Urban
75.7 spvpm

Rural
20.5 spvpm

Weekday morning
(7am - 10am)
53.4 spvpm

Weekday inter peak
(10am - 4 pm)
46.2 spvpm

Weekday evening
(4pm - 7pm)
63.4 spvpm

Weekday off peak
(7pm - 7 am)
19.0 spvpm

Notes about Strategic Road Network (SRN) and Local 'A' Road metrics

This release brings together figures from the SRN and local 'A' roads. There are multiple measures that are included in this report to demonstrate the levels of congestion including average speeds, reliability, and delay. Details on this data and the the considerations that must be accounted for are included in the table below.

What do Congestion Statistics tell us?	Understanding The Data	Important Considerations
What Comparisons Can be Made?	Trends across all years can be compared on the 'SRN'. Due to a step change in 2019 the local 'A' roads data can only be compared on a rolling year basis from December 2018 onwards.	Methodological differences prevent comparisons between road types, while seasonality makes quarter on quarter comparisons inadvisable. Details are available in the Background Quality Report
Interpreting Average Delay	Delay is recorded across all 24 hours of a day on a seconds per vehicle per mile (spvm) basis. Delay here is compared to free flow conditions. This can be an indication of the relative congestion on the network.	Road users do not expect free flow conditions so consciously build in additional time for journeys. Delay may therefore be perceived as relative to expected conditions.
Interpreting Average Speed Data	Average Speeds are weighted by road traffic flows to represent the volume of traffic at different locations and times of day. This can indicate the level of physical congestion on the network.	SRN average speeds only include cars. The Local 'A' Roads include cars and vans and additionally weight by day type, urban/rural and Local Authority distinctions.
Interpreting Reliability Measures	The reliability measures provide the additional journey time required to travel across one link compared to free-flowing conditions.	Reliability measures are calculated for the daytime hours (6am-8pm).

Introduction to Average Speed on the SRN

This measure reflects the average speed of cars on the SRN across the entire day (24 hour period).

The measure weights speed observations from a sample of vehicles by associated traffic flows so that it is representative of traffic volumes on the roads in different locations and at different times of day (as for average delay).

Geographical Network for SRN

These travel time measures are based on data matched to Highways England's National Traffic Information Service (NTIS) network in England.

The Stratgeic Road Network (SRN)

SRN: Summary figures of average delay and reliability

The summary table below (Figure 3) presents average speed and delay on the SRN in England for 2019. The values for the previous year (2018), and the percentage change in average speeds and delays are also shown.

Figure 3: Summary of recent changes in average speed, average delay compared to speed limit and reliability on SRN in England
(Tables CGN0401a, CGN0402a and CGN0403)

	Year ending Dec-2019	Year ending Dec-2018	% Change
Average speed (miles per hour)	58.8	59.0	-0.5%
Average delay (seconds per vehicle per mile)	9.5	9.4	0.9%
Reliability (% additional time)	67.3%	68.4%	-1.1pp

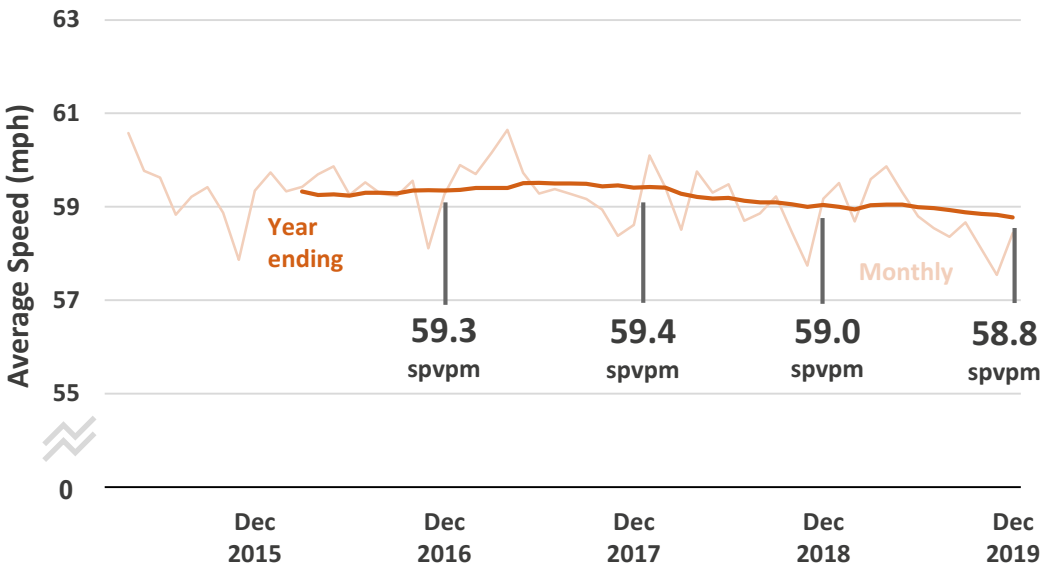
pp = percentage point

SRN: Average speed

For **2019**, the **average speed on the SRN** was **58.8 mph** This is **0.5% down on 2018**, which means on average vehicles were moving at a slightly lower speed in 2019 compared to 2018.

The annual average speed has remained broadly stable for the last 4 years, since December 2016 the average speed decreased by **0.5 mph**, which is a **1.0%** decrease.

Figure 4: Average speed on the Strategic Road Network
(Table CGN0401a)



SRN Background

The SRN accounts for less than 3% of the road network in England by length and carries around a third of all the traffic.

Free Flow on SRN

Free flow travel times, which apply to both the average delay and reliability measures, are currently set equivalent to the speed limit, for each individual road section.

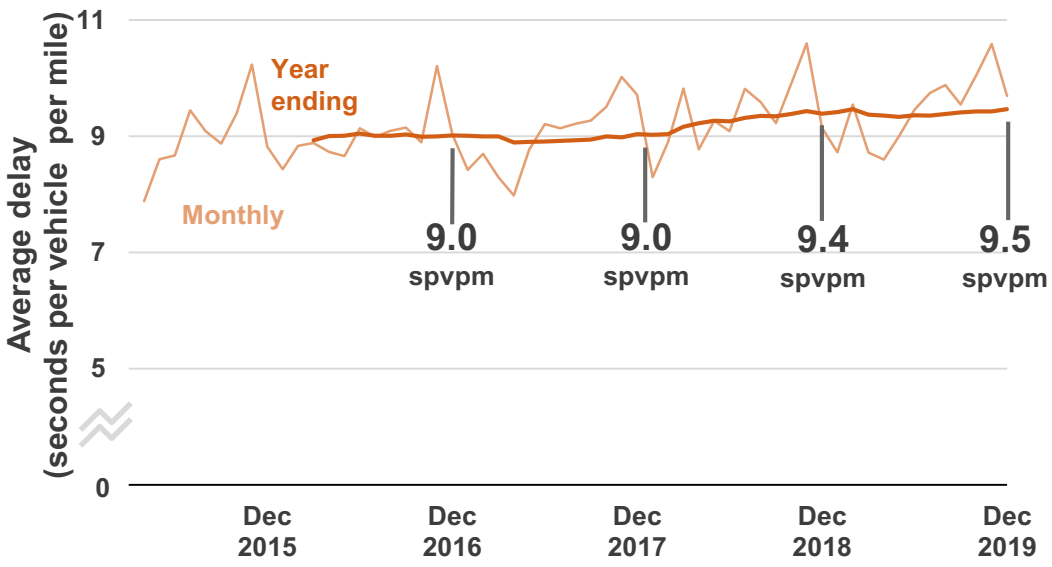
SRN: Average delay

For **2019**, the **average delay on the SRN** is estimated to be **9.5 seconds per vehicle per mile** (spvpm) compared to speed limits. This is 0.9% **higher compared** to 2018, which means on average there was more delay in 2019 compared to 2018.

The congestion data shows some seasonality particularly when we move to and from British Summer Time. The average delay is slightly higher when clocks go back at the end of October which might be attributed to darker mornings leading to people getting up later, therefore there are more people on the roads during peak time. In April, when we move to British Summer Time, the average delay is slightly lower, which could be attributed to people getting up earlier as it is lighter so there is fewer people on the roads during peak time.

The annual average delay remained broadly stable in the last 4 years, since December 2016 it increased by **0.5** spvpm (up **5.0%**).

Figure 5: Average delay on the SRN (Table CGN0402a)



Average Delay Example

Consider a road section of 10 miles, with a free flow speed of 60 mph. If a vehicle was able to travel at the free flow speed, it would take 10 minutes to traverse this section of road
If, instead, the vehicle is only able to travel at an average speed of 50 mph, it would take 12 minutes to traverse the road section.
As this would take an extra 2 minutes (or 120 seconds) to travel the 10 miles, the average delay for this vehicle per mile would be 12 seconds.

Technical note for reliability on SRN

For reliability measure there are several further definitions. A 'journey' represents travel across one link on the network. An 'on time journey' is defined as one which is completed within a set reference time. Free flow reference times are based on actual speed limits.

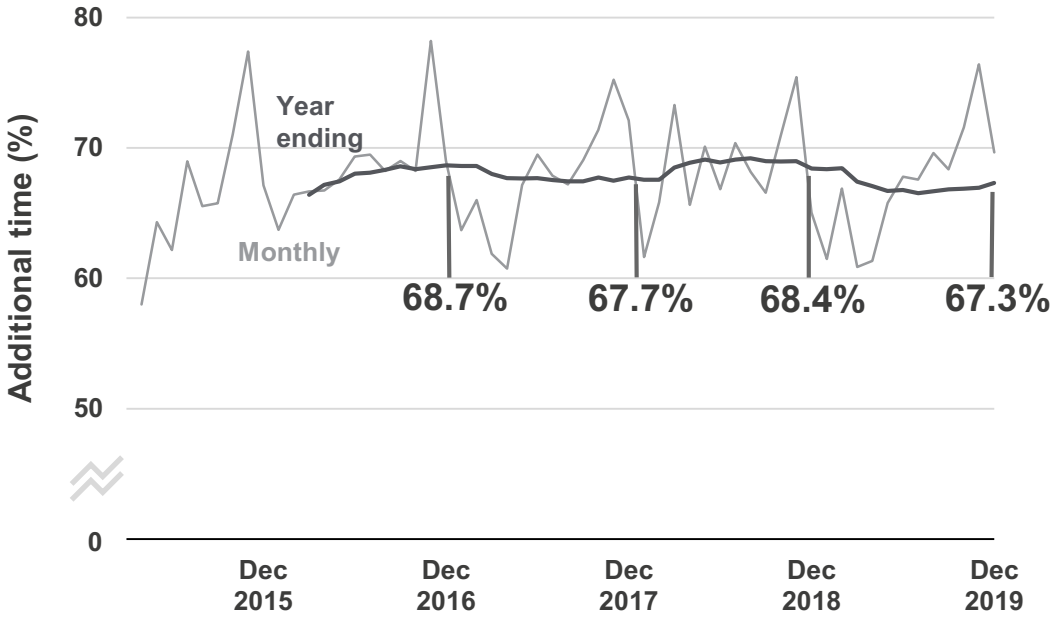
Unlike the average delay and average speed figures, which are calculated across all 24 hours of the day, the reliability figures are calculated across daytime hours (6am to 8pm) - where network demand is at its highest.

SRN: Reliability

For **2019**, on average, **67.3% of additional time was required compared to speed limits**, to ensure on time arrival on individual road sections of the SRN. This is **down 1.1 percentage points** compared to 2018 so, on average, a **slightly lower proportion of additional time** is required to ensure on time arrival. This means on average the network is slightly less reliable.

Since December 2016 the index of reliability decreased by **1.4 percentage points** compared to December 2019, so on average a **slightly higher proportion of additional time** was required to ensure on time arrival.

Figure 6: Additional time needed compared to free flow to ensure on time arrival on the Strategic Road Network (Table CGN0403)



The Planning Time Index (PTI or Reliability) monitors the amount of time that would need to be added to speed limits travel times to have a 95% chance of a journey arriving at a destination on time. This is measured as a percentage.

Reliability on the SRN as a whole is calculated by averaging the Planning Time Index (PTI) across individual road sections, weighting by daytime (6am to 8pm) traffic flows for each section. The PTI does not represent the reliability of start to end journeys, across several road sections.

Reliability Example

As an illustrative case, consider an individual road section with a PTI of 60%, for a given year. If the travel time for this section in free flow conditions is 10 minutes, 95% of users leaving 16 minutes to traverse that road section would have arrived on time. Equivalently, users leaving 16 minutes to traverse the same road section would have been on time 19 times out of 20 in the year.

Junction level figures

While changes in speed and delay between years may appear large in some cases, the variations should be interpreted with caution. When travel time figures are based on data from a single road they are more sensitive to disturbances such as road works and other local events. Therefore, road level speed and delay are expected to have greater variation from year to year than national figures.

Junction level tables

Travel time measures for individual junctions on the SRN are available from 2017 onwards.

The annual **average speed** and **Average delay** for individual junctions can be found in Tables CGN0401b and CGN0402b

SRN: Junction level travel time measures

Figure 7 shows the average delay on the SRN in England at a junction level to give more granularity.

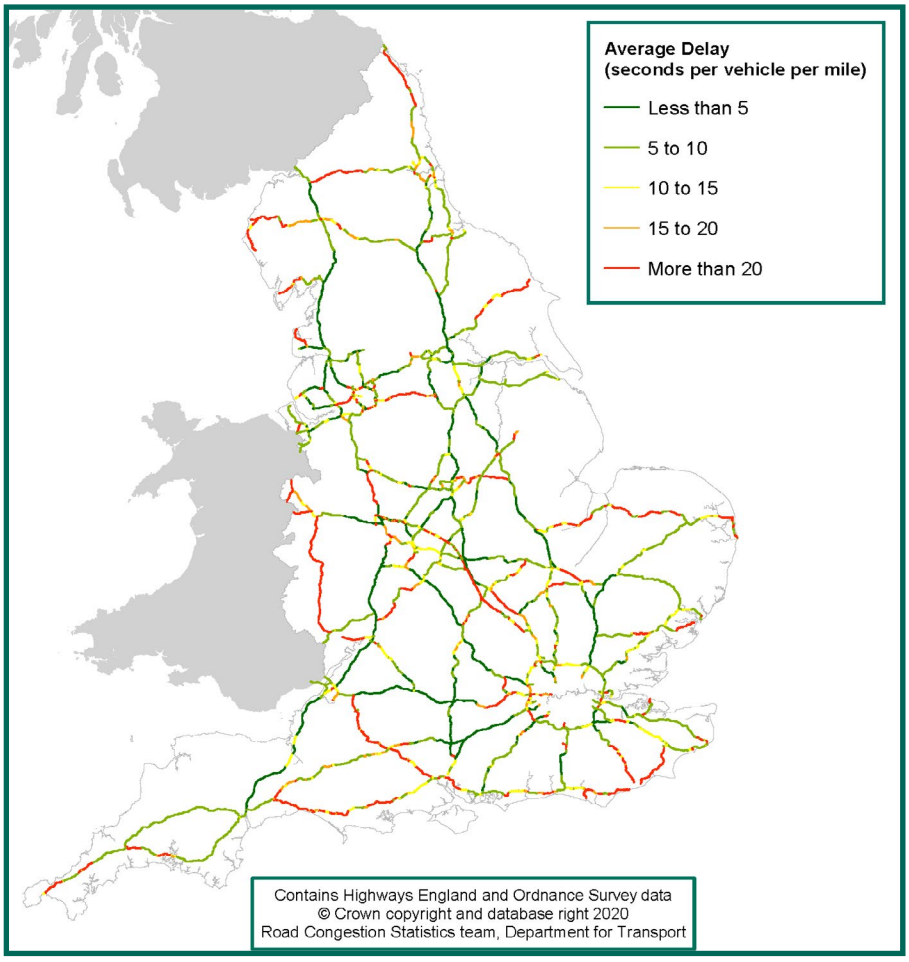
Average speed

The majority of junctions had an average speed over 50mph in 2019. Around a fifth of junctions had average speeds of less than 45mph such as the A47 in the East of England, A49 in the West Midlands and the A21 in the South East. Several roads in and around major cities, such as the A57 and A663 in the North West recorded average speeds of 30mph or below. This may be due to the road type, as it is harder to achieve a high speed on a single carriageway.

Average delay

In line with the national figure, the average delay on individual junctions is less than 10 seconds across England in 2019. Around major cities, the delay is around 20 spvpm. This could be due to the high demand on the network around them relative to their capacity. The roads with the greatest increases in delay also tended to have the greatest decreases in average speed. These were primarily in areas with ongoing roadworks, implemented as part of the Road Investment Strategy (RIS), reducing lane availability, such on the M27 and M4 in the South East and the M62 in the North West.

Figure 7: Average delay on the Strategic Road Network in England, 2019



Local ‘A’ roads fact

The local ‘A’ road network accounts for around 10% of all English roads by length, but carries around a third of all traffic.

Step Change in Flow Weighting

The local ‘A’ road congestion statistics had a step change introduced in 2019.

The change is a result of the road traffic data used to weight congestion statistics moving to the 2011 census definitions of urban and rural.

The 2018 figures were calculated for quality assurance purposes and used as the comparison in this release.

Further information can be found in the Background Information.

Local 'A' Roads

Local ‘A’ Roads: Summary figures of average speed and delay

The summary table below (Figure 8) presents average speed and delay on local ‘A’ roads in England, for specified time periods and by road type, in 2019. The value for the previous year (2018), and the percentage change in average speeds and delays are also shown.

Figure 8: Summary of recent changes in average speed and average delay compared to free flow on local ‘A’ roads in England
(Tables CGN0501a and CGN0502a)

	Year ending Dec-19	Year ending Dec-18	% Change
Average speed (miles per hour)			
All day (24 hour period)	**25.3**	**25.3**	⇔ **0.0%**
Time periods			
Weekday morning peak (7am-10am)	23.7	23.6	⇔ 0.4%
Weekday inter peak (10am-4pm)	24.8	24.9	⇔ -0.2%
Weekday evening peak (4pm-7pm)	22.2	22.2	⇔ 0.1%
Weekday off peak (7pm-7am)	30.8	30.9	⇔ -0.2%
Road classification			
Urban roads	18.0	18.1	⇩ -0.6%
Rural roads	35.9	35.8	⇔ 0.3%
Average delay (seconds per vehicle per mile)			
All day (24 hour period)	**44.0**	**43.2**	⇧ **1.8%**
Peak times			
Weekday morning peak (7am-10am)	53.4	53.3	⇔ 0.4%
Weekday inter peak (10am-4pm)	46.2	45.1	⇧ 2.5%
Weekday evening (4pm-7pm)	63.4	62.7	⇧ 1.1%
Weekday off peak (7pm-7am)	19.0	18.2	⇧ 4.0%
Road classification			
Urban roads	75.7	74.0	⇧ 2.3%
Rural roads	20.5	20.1	⇧ 1.9%

Introduction to average speed on local ‘A’ roads

This measure reflects the average speed of vehicles on local ‘A’ roads across the entire day (24 hour period).

The measure weights speed observations from a sample of vehicles by associated traffic flows so that it is representative of traffic volumes on the roads in different locations and at different times of day (as for average delay). The weighting for local ‘A’ roads also weights by hour, day type, month, urban and rural classification and local authority.

Geographical network for local ‘A’ roads

These travel time measures are based on data matched to the Ordnance Survey Highways Network representation of the local ‘A’ road network in England.

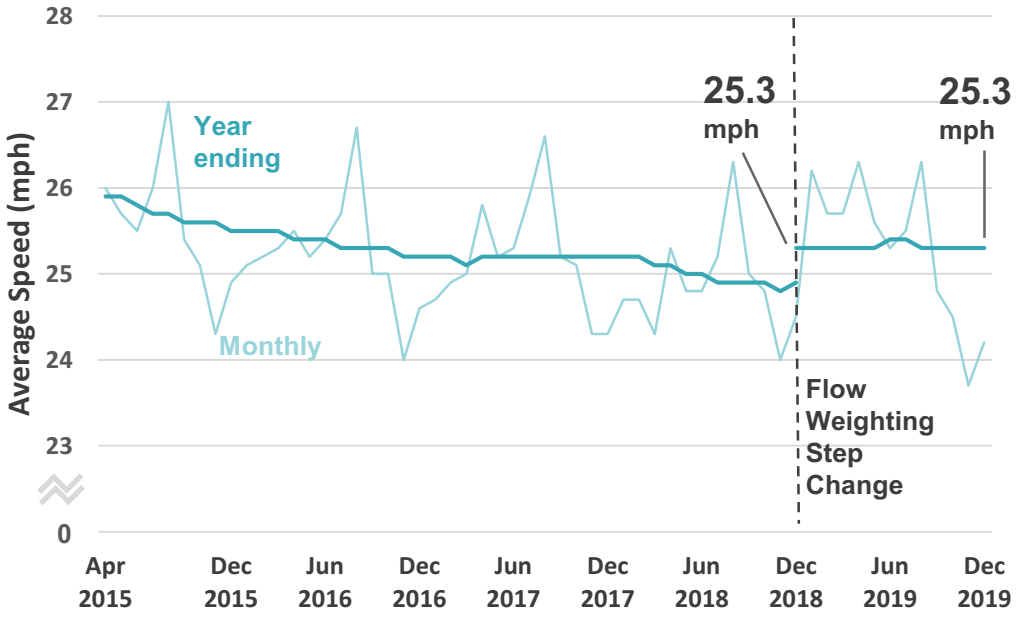
Local ‘A’ roads: Average speed

National overview of average speed

The **average speed on local ‘A’ roads in England** across 24 hours in **2019** is estimated to be **25.3 mph**. This has remained stable over 2019 with no change compared to the previous year.

There has been a large step change in average speeds due to changes in the underlying road traffic data used to weight the local 'A' roads data. It is therefore not possible to compare this new data over a longer time period.

Figure 9: Average speed on local ‘A’ roads in England (Table CGN0501a)



Average speed at peak times

Average speeds on local ‘A’ roads during the **weekday morning peak** (7am to 10am) and the **weekday evening peak** (4pm to 7pm) were **23.7 mph** and **22.2 mph** in 2019. Compared to 2018 these have increased marginally, 0.4% and 0.1% respectively.

Figures for inter peak (weekdays 10am to 4pm) and off peak (weekdays 7pm to 7am) are available from 2017 and onwards. Average speeds on local ‘A’ roads were **24.8 mph** at **inter peak** periods and **30.8 mph off peak** in 2019. These speeds are marginally lower than 2018 average speed during those periods of 0.2% each.

Definition

For statistical purposes, DfT defines 'urban' roads to be those within a settlement of 10,000 people or more. This is consistent with the *Rural and Urban Area Classification 2011*. All other roads are defined as 'rural'.

Free flow on local 'A' roads

Free flow travel times (used to calculate the average delay measure) are currently calculated using the 85th percentile speed observation, for each individual road section. These are 'capped' at national speed limits.

Average speed on urban and rural roads

On **urban classified local 'A' roads, average speeds were 18.0 mph** in 2019, compared to **35.9 mph on rural local 'A' roads**.

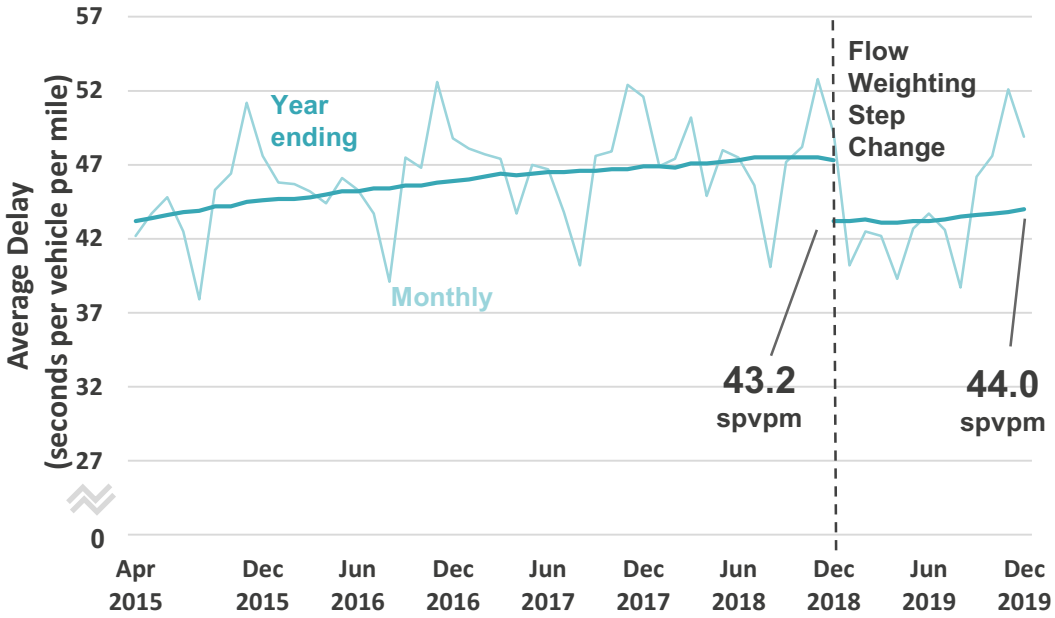
Despite the differences in speed between the two road types, drivers on urban and rural local 'A' roads may perceive changes in speed levels across the year differently. Although both road types had change of 0.1 mph across the year, this accounts for a 0.6% variation on urban roads and a 0.3% variation on rural local 'A' roads.

Local 'A' roads: Average delay

National overview of average delay

The **average delay on local 'A' roads in England** across 24 hours in **2019** is estimated to be **44.0 seconds per vehicle per mile (spvpm)** compared to free flow. This is a 0.8 spvpm increase, or **1.8% increase** compared to 2018, which means that on average there was more delay.

Figure 10: Average delay on Local 'A' roads (Table CGN0502a)



Local ‘A’ roads fact

Almost one third of the English local ‘A’ road network is classified as urban with the remaining two-thirds classified as rural.

Average delay at peak times

In 2019, average delay on local ‘A’ roads during the **weekday morning peak** (7am to 10am) was **53.4 spvpm** and **weekday evening peak** (4pm to 7pm) was **63.4 spvpm** compared to free flow. This represents a 0.2 spvpm (or 0.4%) increase in the weekday morning peak, and a 0.7 spvpm (or 1.1%) increase for the weekday evening peak, compared to 2018.

Outside of peak hours for 2019, delay in the **inter peak** period (10am to 4pm) was estimated as **46.2 spvpm** (up 2.5%), while the weekday off peak period (7pm to 7am) was was **19.0 spvpm,** up 4.0% compared to 2018**.**

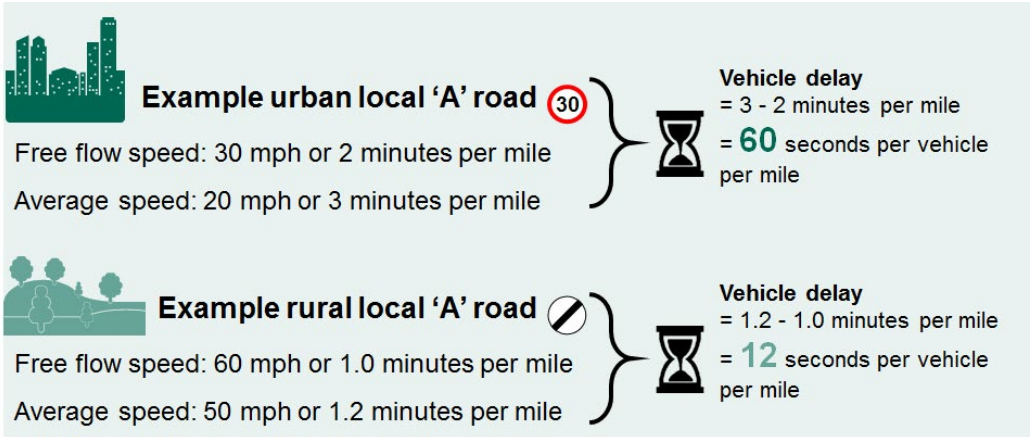
Average delay on urban and rural roads

On **urban classified local ‘A’ roads, average delay was 75.7 spvpm** in 2019, compared to **20.5 spvpm on rural classified local ‘A’ roads**. These have both increased compared to 2018, by 2.3% and 1.9% respectively.

Example: Average delay on urban and rural local ‘A’ roads

It is important to note that urban roads generally have lower free flow speeds than rural roads. As a result, a fixed absolute decrease in observed speeds will generally translate into a higher level of delay on urban roads relative to rural roads. An example of this is illustrated in Figure 11.

Figure 11: Illustrative example of average delay on urban and rural local ‘A’ roads



Regional and Local Highway Authority figures

The annual average speed for each region and Local Highway Authority can be found in Table CGN0501b.

The annual average delay for each region and local highway authority can be found in Table CGN0502b.

Local Highway Authority Boundaries

In April 2019 the geographical boundaries between Bournemouth, Poole, Christchurch were changed. The local highway authority maps have been created with the boundaries as at 1st January 2019.

Local 'A' roads: Local authority travel time measures

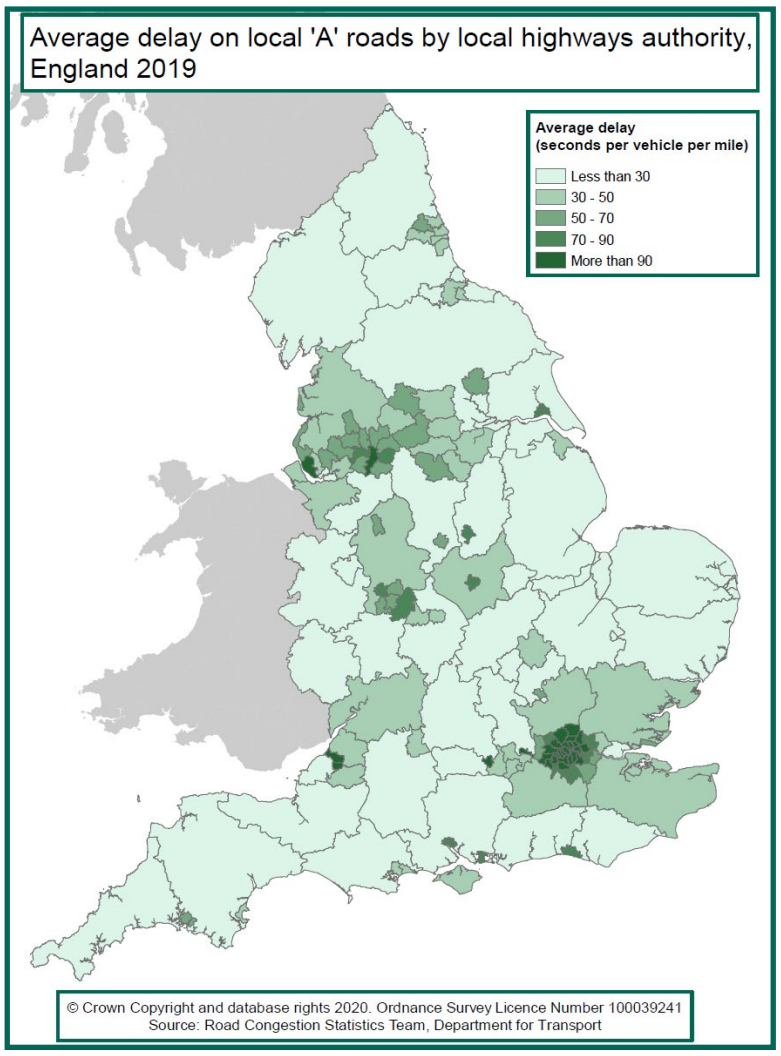
Average speed

Whilst the average speed at the national level was stable in 2019, the overall trend at the regional level is a slight decrease in speed. The Liverpool City region has experienced significant decreases in speed, and increases in delay, in 2019, possibly linked to a large-scale investment in their key route network being implemented. The average speed in the Merseyside Metropolitan County is 21.0mph in 2019. London remains the slowest region in the country at 14.7mph.

Average delay

The average delay on local 'A' roads in each Local Authority for 2019 is shown in Figure 12. Overall, levels of average delay are generally higher in Local Highway Authorities within and close to major urban centres. London authorities continue to experience the highest levels of delay with 110.3 spvpm delay, followed by the North West at 50.1 spvpm. Rutland is the local highways authority with the lowest level of average delay in 2019 at 12.2 spvpm.

Figure 12: Average delay on local 'A' roads by Local Highway Authority in England, 2019



Understanding road level figures

While changes in speed and delay between years may appear large in some cases, the variations should be interpreted with caution. When travel time figures are based on data from a single road they are more sensitive to disturbances such as road works and other local events.

Road level speed and delay

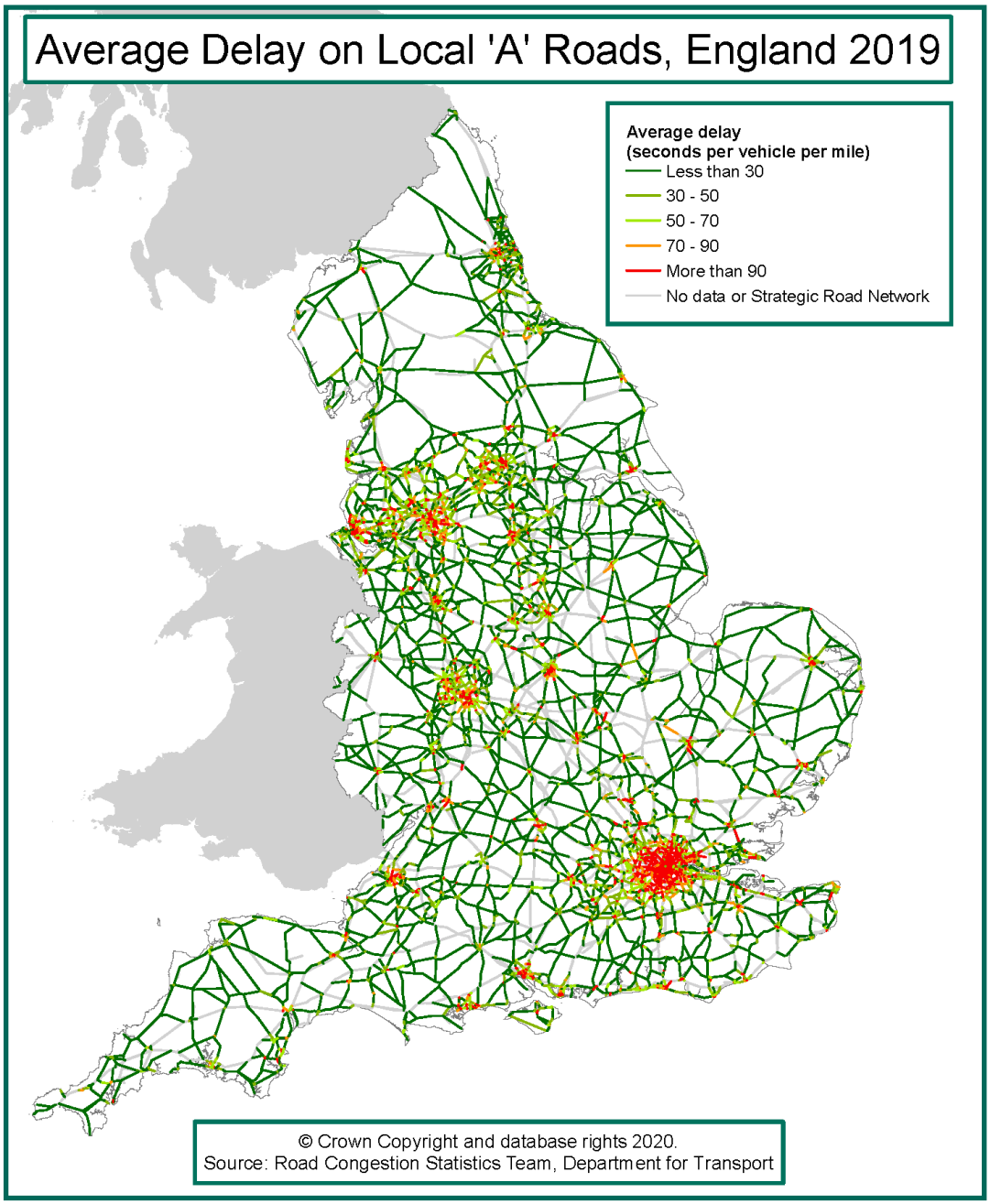
Travel time measures for individual local 'A' roads are available from 2017 onwards.

The annual **average speed and average delay** for individual roads can be found in Tables CGN0501c and CGN0502c.

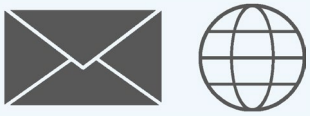
Local 'A' roads: Road level travel time measures

This section provides a futher breakdown in the form of road level travel time measures. Figure 13 shows the average delay on the local 'A' roads network.

Figure 13: Average delay on local 'A' roads in England, 2019



Request for feedback



We are keen to receive feedback from users of transport statistics. If you have any comments about how the statistics in this release are presented or analysed, please contact us using the details listed on the front page of this release.

Background information

Context and user feedback

Measures for the Strategic Road Network (SRN) were developed as part of the first Road Investment Strategy (RIS1), which sets out a long-term programme for England's SRN.

The local 'A' road measures presented in this release were developed to provide a more complete picture of travel times on local 'A' roads and also to align with measures introduced for the SRN.

Following user feedback this release has developed the statistics to include junction/road level data for the SRN and local 'A' roads. The local 'A' roads tables now include breakdowns for inter- and off-peak average speed and delay at a national level.

We will continue to review the content and presentation of these statistics, which we expect to develop further over time. Please contact us using the details at the bottom of the front page with any feedback you have, or if you would like further information.

National Statistics

Statistics on Road Reliability and Congestion were designated as national statistics in 2012 signifying that they are produced to the high professional standards set out in the Code of Practice for Statistics. They undergo regular quality assurance reviews to ensure they meet customer needs.

Details of ministers and officials who receive pre-release access to these statistics up to 24 hours before release can be found here.

Methodology and technical details

It is important to note that although there are figures for average speed and average delay on both networks, they are not directly comparable. A full explanation and further information on the data used, methodology, quality assurance and other sources of data can be found in the Background Quality Report.

Due to methodological changes in the underlying traffic flow data used to weight the Local 'A' road data, a break in the timeseries has been introduced to the 2019 estimates of average speed and delay. The 2018 data was calculated for quality assurance purposes, to calculate the 12 month rolling average, and the percentage change. Further information on this change, including a comparison of the 2018 data, can be found in the methodology note.

Next update

The next tables in this series are expected to be published in June 2020. This will contain monthly, and annual (year ending) figures, for the period April 2019 to March 2020. This will include new figures for the period January to March 2020.

The next written report is expected to be published in February 2021, and will contain annual figures for 2020.

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