



Department for Transport

Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2019

About this release

This publication provides information on the number of passengers travelling by rail into and out of a number of selected major city centres in England and Wales.

The statistics are based on a count of passengers carried out in autumn 2019. They represent passengers on National Rail services on a 'typical' weekday. For more information see the [notes and definitions](#).

These statistics refer to autumn 2019 and therefore do not show the impact of [COVID-19](#) on rail travel.

In this publication



Passenger numbers:

These show the level of rail demand for each city centre.



Crowding measures:

These show levels of crowding on routes into major cities. There are two key crowding measures: the percentage of 'passengers standing' and 'passengers in excess of capacity (PiXC)'.



Contextual information:

Click on this symbol for a web-based interactive dashboard which provides a range of additional contextual information and allows you to explore the data further.

Autumn 2019



Summary statistics across all major cities on a typical weekday in autumn 2019 (compared with autumn 2018):

Passenger arrivals

1.8 million
↑ 2.2%

Passengers standing across AM & PM peaks

16.4%
↓ 0.4pp

Passengers in excess of capacity

3.1%
↓ 0.4pp

Daily passenger arrivals into major cities increased to over 1.8 million in autumn 2019 as rail use continued to grow.

London has the highest rail passenger numbers (at 1.1 million) with 8 times more passengers across the day than Birmingham (second highest at 136,000).

55% of daily arrivals were in the morning peak (7 to 10am) in London, reflecting that most rail journeys are for commuting.

During peak hours nearly 233,000 passengers (18.8%) were standing on trains in London

The proportion of passengers standing overall has decreased driven by a decline in London. Birmingham had the second highest with 16,800 passengers standing.

16% of passengers were standing on trains in the peaks across all selected major cities

Morning peak crowding in London is at its lowest level since 2014

Nearly 44,000 (3.5%) passengers were in excess of capacity (PiXC) on trains across both peaks in London. Cardiff had the highest crowding level (3.7%) with 1,200 passengers over train capacity.

3.1% of passengers were in excess of capacity overall during peak hours, a decrease of 0.4 percentage points from autumn 2018

Despite growing demand, extra capacity provided by new services or improved rolling stock has been seen, helping to drive this overall fall in crowding. Eleven out of 14 cities saw an increase in peak seats compared to last year.



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1. About this release

Scope

These statistics are based on counts of rail passengers and represent rail travel during a 'typical' weekday in the autumn.

The count period in autumn covers services from the preceding May timetable change and excludes days when there was disruption, where possible. Data is collected from franchised train operators at selected major cities across England and Wales. It does not include Open Access operators such as Heathrow Express and Grand Central.

Coverage

This publication focuses on crowding during the morning and evening peak hours, when rail travel tends to be busiest.

- The AM peak covers trains arriving into city centres between 07:00 and 09:59, whereas the PM peak reflects trains departing between 16:00 and 18:59.
- A city centre is defined using a cordon to include the major city centre stations. In some cases passengers will not alight at the cordon station but are counted there.
- For crowding statistics, passengers are counted at the busiest station on the route when entering or leaving the city centre.

City centres included in the release



Crowding in context

Crowding occurs when the train's capacity has not met the level of passenger demand, and varies by route and time of day. **Some analysis on the pressures of variable demand throughout the day can be found on page 7 of this release.**

Although variations in crowding levels can seem small across cities and over time, the actual numbers of passengers affected by crowding can be large. In London, where passenger numbers are in the hundreds of thousands over the peak periods, a small rise in crowding levels can translate to a large number of passengers experiencing crowded conditions overall.

Additional contextual information on how train design and capacity has changed over time is also available in the [dashboard](#) that accompanies this publication. This illustrates how some trains are specially designed for commuter routes to enable more comfortable spaces for standing. This helps to alleviate pressures during peak travel by increasing capacity on the network.

Impact of Coronavirus (COVID-19)

These crowding statistics refer to autumn 2019 and therefore do not show the impact of COVID-19 on rail travel.

The impact of the pandemic on rail crowding will be seen in the autumn 2020 release (which is scheduled to be published in Summer 2021). In the next publication, crowding will reflect passenger numbers in excess of a reduced capacity as a result of timetable changes and social distancing guidelines.

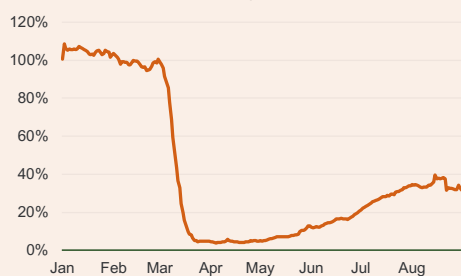
The current rail trends relating to the COVID-19 pandemic show:

COVID-19 data sources

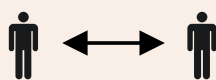
For more information on COVID-19 impacts see:

- DfTs [transport use during the COVID-19 pandemic](#) statistics
- DfTs [All Change? Travel tracker](#)
- Office for National Statistics (ONS) [Coronavirus and the social impacts on Great Britain](#).
- Transport Focus weekly [Travel during COVID-19](#) survey

Figure 1: Rail passenger journeys
(weekly average compared to the equivalent period in 2019)



Source: DfT [transport use during the COVID-19 pandemic](#) statistics



A reduced timetable is in operation, which alongside social distancing measures has led to reduced capacity

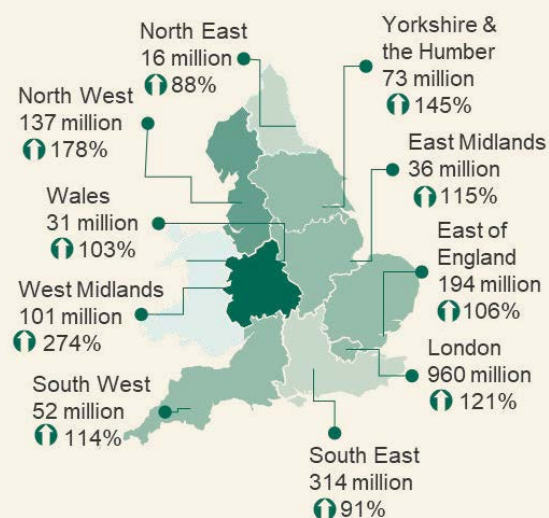
2. Key background trends

The following section presents previously published statistics about the rail system for context.

Annual rail passenger journeys reached their second highest level in 2019/20

- Since rail privatisation in 1994/95, annual passenger rail journeys have doubled to 1.7 billion journeys with an average annual increase of 3.5%.
- In 2019/20 passenger journeys declined by 0.8% due to the large decline in rail use in March 2020 because of the COVID-19 pandemic and the advice not to travel.
- All regions in England and Wales have shown growth in rail passenger journeys across the last two decades, with particularly strong growth seen in the West Midlands and North West of England.
- London has the highest level of rail usage with almost two-thirds of rail journeys (960 million) in 2018/19 starting or ending in London. It also has the highest population density and the lowest level of car ownership per household.

Figure 2: 2018/19 regional rail usage and change since 1997/98



Source: Office of Rail and Road [Passenger Rail Usage 2019/20](#)
[Regional Rail Usage 2018/19](#)

Rail trips are primarily (54%) for commuting to work or school in England

- Nearly one-third of rail trips were for leisure purposes and one in ten trips were for business purposes in England in 2019.
- The average number of rail commuting trips made per person in England increased by around two-thirds between 2002 and 2019 (from 6 trips per person per year to 10); during this period, the number of commuting trips made by car per person has declined by a quarter.

- On average, 21 rail trips per person per year are undertaken. Rail travel is most common among:



Males
aged 17-49
(average 41
trips per person
per year)



Higher
household
income groups
(44 trips per person
per year)



Professional or
managerial
occupations
(39 trips per person
per year)

Figure 3: Rail journey purpose, England 2019



Source: Department for Transport
[National Travel Survey 2019](#)

Commuters are the least satisfied with crowding levels

- Commuter journeys are consistently rated lower for overall satisfaction than other journey purposes (see Fig. 4).
- After how well the train company deals with delays and “others” the level of crowding on trains was the third biggest driver of dissatisfaction in spring 2020.
- Passengers being able to get a seat on the train was the third most important priority for improvement behind reliability and punctuality of the train and satisfaction with value for money of the price of tickets.
- The proportion of journeys rated satisfactory for the level of crowding is particularly low for regional centres; particularly Birmingham, Manchester and Leeds.

Source: Transport Focus
[National Rail Passenger Survey](#)

Figure 4: Proportion of journeys rated as satisfactory by journey purpose, NRPS spring 2020

Journey Purpose	Overall satisfaction	Satisfaction with crowding levels
All journeys	82%	73%
Commuters	75%	61%
Business	86%	82%
Leisure	89%	84%

Table 1: Proportion of journeys rated satisfactory by station, NRPS autumn 2019 and percentage point change from autumn 2018

City station	Overall satisfaction			Satisfaction with crowding		
	2019	2018	Change	2019	2018	Change
Birmingham New Street	77%	87%	-10	58%	63%	-5
Leeds	77%	74%	3	59%	56%	3
Cambridge	81%	77%	4	80%	74%	6
Manchester Picadilly	80%	75%	5	57%	65%	-8
Bristol Temple Meads	81%	68%	13	64%	55%	9
Cardiff Central	71%	75%	-4	65%	69%	-4
Newcastle	89%	83%	6	81%	64%	17
Leicester	78%	82%	-4	66%	64%	2
Liverpool	82%	89%	-7	72%	80%	-8
Reading	85%	81%	4	76%	66%	10
Sheffield	76%	79%	-3	66%	62%	4
London Victoria	84%	77%	7	76%	69%	7
London Bridge	82%	79%	3	67%	64%	3
London Liverpool Street	79%	82%	-3	67%	65%	2

3. Passenger demand

Passenger demand has increased in thirteen out of fourteen major cities

All day arrivals:



London



Birmingham



Manchester

- London remains the city with the highest rail passenger numbers, where passenger arrivals are 8 times higher than Birmingham, the city with the second highest.
- Bristol (up 9.5%) and Cambridge (up 5.6%) saw the largest percentage increases in all day arrivals compared with autumn 2018.
- Across all cities, arrivals in the AM peak (up 2.4%) have increased faster than departures in the PM peak (up 1.2%).
- Throughout the day, arrivals increased more in all cities outside London (up 4.1%) than in London (up 1.0%).

i Passenger number methodology

Passenger numbers are taken from counts conducted on trains at the city centre stations themselves, including standard and first class rail passengers. All services on a 'typical' autumn day are counted.

Table 2: Passenger arrivals and departures by city: autumn 2019

City	All day arrivals		AM peak arrivals		PM peak departures	
	Total	Change from 2018 (%)	Total	Change from 2018 (%)	Total	Change from 2018 (%)
Birmingham	135,800	↑ 1.5%	50,400	↑ 5.2%	51,000	↑ 4.1%
Brighton	33,200	↑ 0.8%	8,100	↑ 4.6%	8,600	↓ -1.4%
Bristol	33,200	↑ 9.5%	10,400	↑ 9.3%	12,700	↑ 21.7%
Cambridge	28,400	↑ 5.6%	9,300	↑ 8.0%	9,200	↑ 2.2%
Cardiff †	43,500		16,000		16,900	
Leeds	75,900	↑ 5.0%	27,800	↑ 1.7%	27,600	↑ 2.0%
Leicester	29,000	↑ 1.3%	5,800	↓ -3.1%	7,500	↓ -2.0%
Liverpool	65,200	↑ 3.0%	22,300	↑ 4.9%	22,700	↓ -5.1%
Manchester	107,100	↑ 4.1%	35,100	↔ 0.0%	36,800	↑ 1.4%
Newcastle	26,000	↑ 2.2%	4,900	↑ 2.3%	6,500	↓ -2.3%
Nottingham	17,300	↓ -1.7%	5,000	↑ 1.8%	5,400	↑ 0.2%
Reading	103,900	↑ 5.3%	27,100	↑ 4.2%	26,600	↓ -2.7%
Sheffield	34,000	↑ 0.1%	7,600	↓ -2.2%	9,700	↑ 1.1%
All cities outside London						
London	732,500	↑ 4.1%	229,800	↑ 3.9%	241,100	↑ 2.2%
London total	1,112,200	↑ 1.0%	607,400	↑ 1.9%	512,000	↑ 0.7%
All cities	1,844,700	↑ 2.2%	837,200	↑ 2.4%	753,100	↑ 1.2%

† Methodological changes to how missing passenger counts data is estimated mean that passenger demand at Cardiff in 2019 is not directly comparable to previous years.

4. Seating capacity and demand on trains

Since 2010, all cities have experienced increased morning peak demand and all but one have increased morning peak seating capacity

- In 2019, all cities including London have more seat capacity on average across services during the 3 hour morning peak than passenger demand.
- As some routes are busier than others and some passengers choose to travel on particular services (i.e. fast services), these services suffer most from overcrowding.
- Since 2010, total passenger demand in the morning peak has grown faster than seats in every city except for Bristol and Newcastle.
- Leicester is the only city where morning peak seating capacity has declined (by 2%) since 2010, due to a timetable change that saw 2 trains scheduled to arrive just before the end of the peak (10am) replanned to just after.

i Major infrastructure projects

The completion of the Thameslink project has given passengers new journey options into London and the Crossrail project will increase this further.

Outside of London, extensive remodelling of city centre stations allowing for more services and train upgrades help minimise crowding.

London rail travel occurs mainly in the morning peak, whereas in other cities travel is more evenly spread throughout the day

- Over 1.1 million journeys were made into central London on a typical autumn day in 2019. Of these, 55% were made in the morning peak. This is equivalent to over 607,000 passengers, and a 1.9% increase compared with 2018.
- In London, the increase in arrivals was primarily down to an increase in passengers arriving in the peaks (1.5% increase) rather than off-peak arrivals (0.1% increase) compared with a year ago.
- For cities outside of London, there tends to be a more even spread of rail travel across the day, with 30% of arrivals made in the 3 hour morning peak.
- A larger proportion of passengers travel in the evening peak (27.4%) in cities outside London than the morning peak (24.5%), due to a greater share of business and leisure journeys.

Figure 5: Passenger arrivals and departures by hour in both London and regional cities: autumn 2019

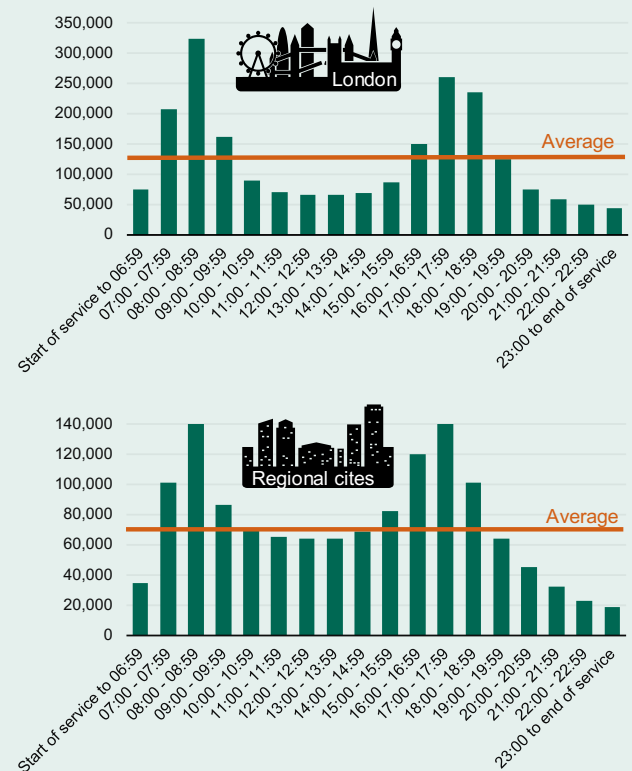
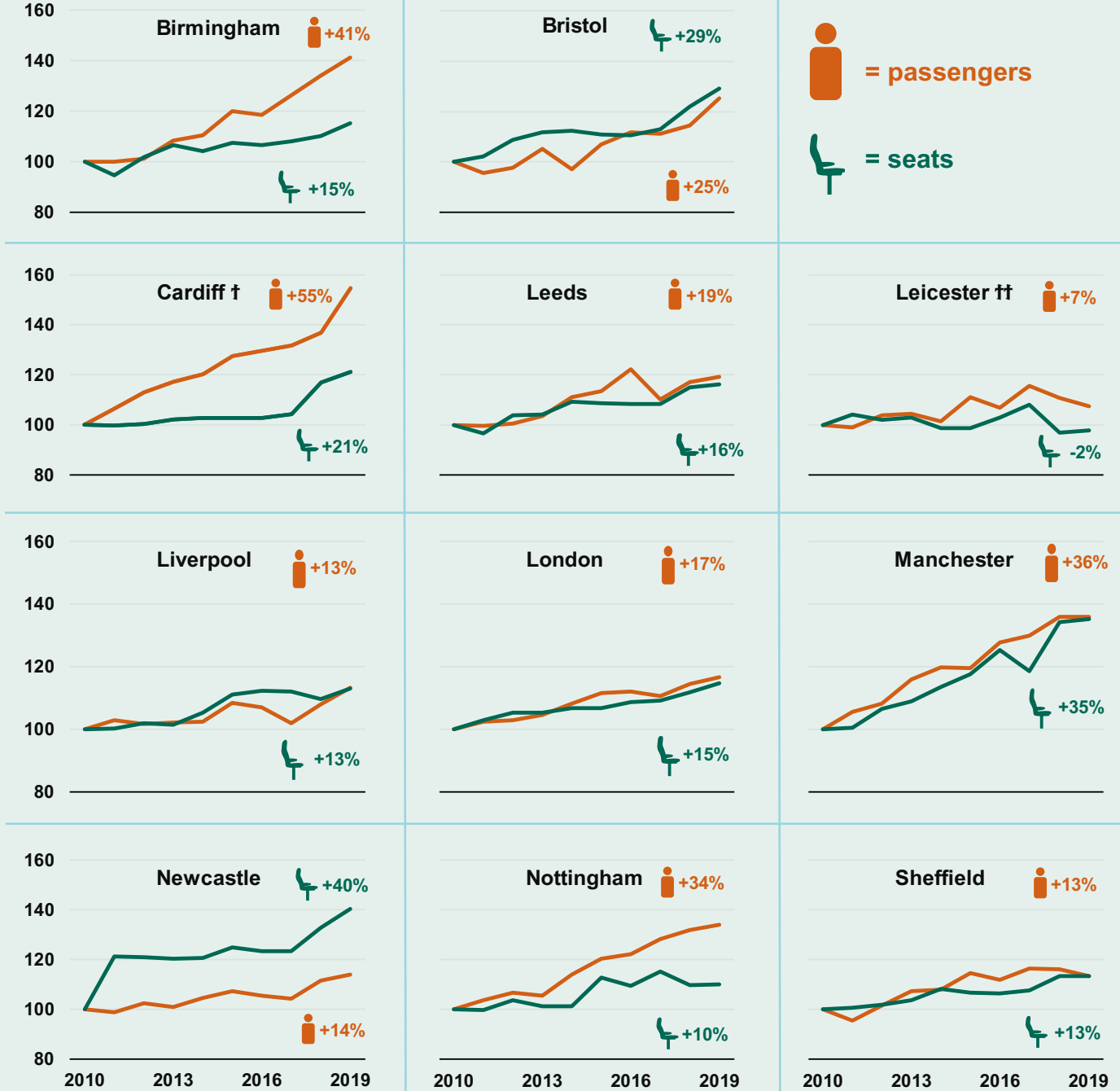


Figure 6: AM Peak standard class passengers and seats by city, 2010-2019 (2010 = 100)

Index: 2010 = 100



Statistics for Brighton, Cambridge and Reading were first published in autumn 2017. Therefore, the figures for 2010 are unavailable for these cities.

† Methodological changes to how missing passenger counts data is estimated mean that passenger demand at Cardiff in 2019 is not directly comparable to previous years.

†† Small timetable changes can lead to a year-on-year change in capacity. For example between 2017 and 2018, a timetable change meant that two services previously arriving into Leicester at 9:55 and 9:57 now arrive into the city centre just outside the peak. This change led to a 2% decrease in seating capacity

i Standard class passengers and seats indices

These indices show the rate of change rather than actual numbers of passengers and seats.

These changes are shown for within the morning peak only, when rail demand is dominated by commuter flows into and out of the major city centres.

The profile of rail travel throughout the day varies by city due to the mix of journey purposes.

5. Passengers standing

Overall the proportion of passengers standing across peaks has decreased

- Across all cities, there has been a 0.4 percentage point (pp) decrease in the proportion of passengers standing during peak hours.
- This was predominantly driven by the 0.6pp decrease in the proportion of passengers standing in London. However, London still has the highest proportion of passengers standing. There were 232,800 passengers standing in London during the peaks which is more than the total number of passengers that arrive into each of the cities outside London during the morning peak.
- All cities outside London overall had an 0.2pp increase in the proportion of passengers standing during peak hours.
- There were large increases in the proportion of passengers standing in Liverpool (up 2.5pp) and Bristol (up 2.4pp).

The percentage of passengers standing across all cities in autumn 2019:



Both peaks
16.4%



AM peak
19.3%



PM peak
13.1%



% standing = Percentage of passengers in excess of standard class seats

% services = Percentage of train services with at least one passenger in excess of standard class seats



Train designs



On some routes, particularly those which serve commuters e.g. Merseyrail, train companies use rolling stock that are designed with a higher capacity of standing space. Therefore, a higher proportion of passenger standing does not necessarily relate to an increase in crowding (PiXC).

Further information on train design and how this has evolved over time is available on the dashboard that accompanies this publication: <http://maps.dft.gov.uk/rail-passengers-and-crowding/interactive-dashboard/index.html>

Table 3: Passengers standing across both peaks by city, autumn 2019

City	Passengers standing	% standing	change from 2018 (pp)
Birmingham	16,800	16.4%	↓ -0.7
Brighton	1,000	6.2%	↓ -0.8
Bristol	1,500	6.3%	↑ 2.4
Cambridge	2,300	12.6%	↓ -1.3
Cardiff †	3,900	11.8%	
Leeds	8,300	15.3%	↑ 0.7
Leicester	400	3.1%	↓ -0.8
Liverpool	3,500	7.5%	↑ 2.5
Manchester	7,600	10.2%	↑ 0.5
Newcastle	300	3.1%	↑ 0.4
Nottingham	700	6.6%	↑ 0.2
Reading	600	1.2%	↓ -1.1
Sheffield	800	4.5%	↓ -0.2
All cities outside London	47,700	4.6%	↑ 0.2
London	232,800	18.8%	↓ -0.6
All cities	280,600	16.4%	↓ -0.4

† Methodological changes to Cardiff data mean that the 2019 figure is not directly comparable to previous years.

In the morning peak, the number of passengers standing increased in cities outside London

- Overall, the number of passengers standing during the morning peak increased slightly in cities outside London. However the number of passengers standing has decreased in 7 cities during the 3 hour morning peak.
- In the AM peak, Liverpool and Bristol had the largest increases in the number of passengers standing (up 2.5pp and 1.4pp respectively).
- While London has the highest level of standing passengers, Birmingham and Liverpool have seen the largest increase in the morning peak since 2010. Leicester has seen the largest decrease of 3.1pp.

i Rolling stock changes

Large decreases in the proportion of passengers standing (e.g. Cambridge and Reading) are driven by either additional services and/or new rolling stock with more seating capacity.

Table 4: Percentage of passengers standing in the AM peak by city: autumn 2019

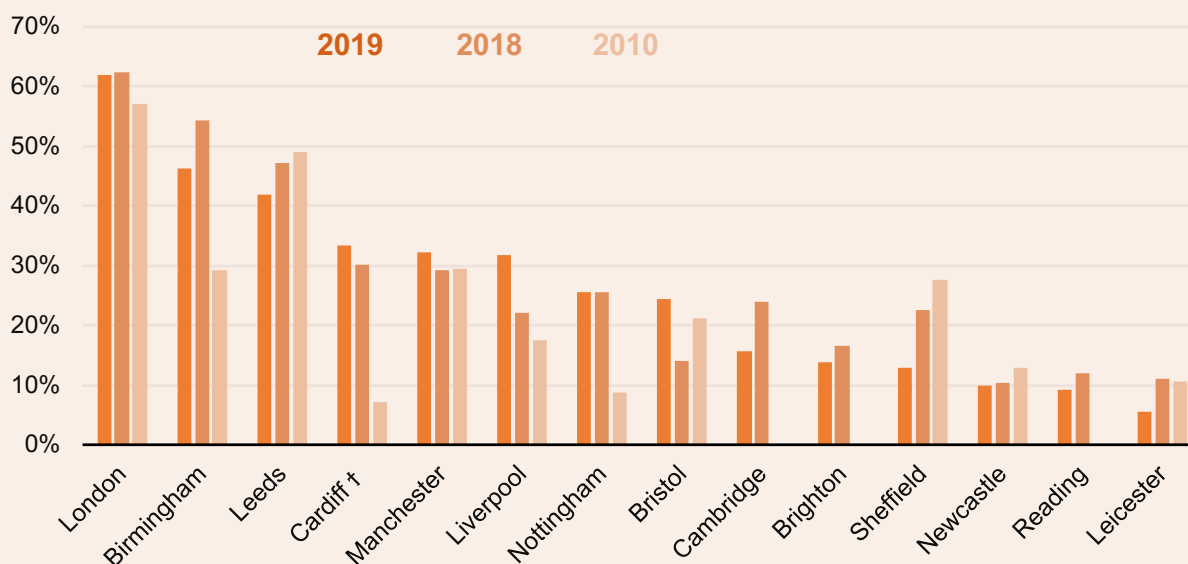
City	Passengers standing	% standing		change from 2018 (pp)	change from 2010 (pp)
Birmingham	9,300	18.0%	U	-1.2	9.3
Brighton	500	6.4%	U	-0.1	-
Bristol	500	4.4%	I	1.4	-3.0
Cambridge	1,300	14.4%	U	-1.6	-
Cardiff †	2,300	14.2%		-	-
Leeds	4,300	15.7%	I	0.5	2.9
Leicester	100	1.2%	U	-0.6	-3.1
Liverpool	2,200	9.1%	I	2.5	6.4
Manchester	4,200	11.5%	I	1.2	0.4
Newcastle	200	4.3%	U	-0.7	1.4
Nottingham	200	4.9%	I	0.3	2.7
Reading	500	1.7%	U	-1.5	-
Sheffield	300	4.1%	U	-0.6	-3.0
All cities outside London	25,800	11.1%		0.1	-
London	148,900	22.1%	U	-0.6	2.8
All cities	174,700	19.3%		-0.4	-

All figures in this table are rounded to the nearest 100 passengers. Totals may not sum due to rounding.

Statistics for Brighton, Cambridge and Reading were first published in autumn 2017. Therefore, the figures for 2010 are unavailable for these cities.

† Methodological changes to Cardiff data mean that the 2019 figure is not directly comparable to previous years.

Figure 7: AM peak services with standing into major cities, compared with the previous year and 2010



Statistics for Brighton, Cambridge and Reading were first published in autumn 2017. Therefore, the figures for 2010 are unavailable for these cities.

† Methodological changes to Cardiff data mean that the 2019 figure is not directly comparable to previous years.

The proportion of passengers standing into London stations has decreased compared to last year

- In autumn 2019, more than 1 in 5 passengers (22.1%) were standing on a service arriving into London within the morning peak. This is a 0.6pp decrease from 2018, but is still higher than the proportion of passengers standing in 2010 (19.3%).
- Marylebone has the largest increase (3.9 pp) in the proportion of passengers standing during the morning peak compared with 2018, while Blackfriars had the largest percentage standing overall.
- Since 2018, King's Cross has seen the largest decline in the proportion of passengers standing in the morning peak.

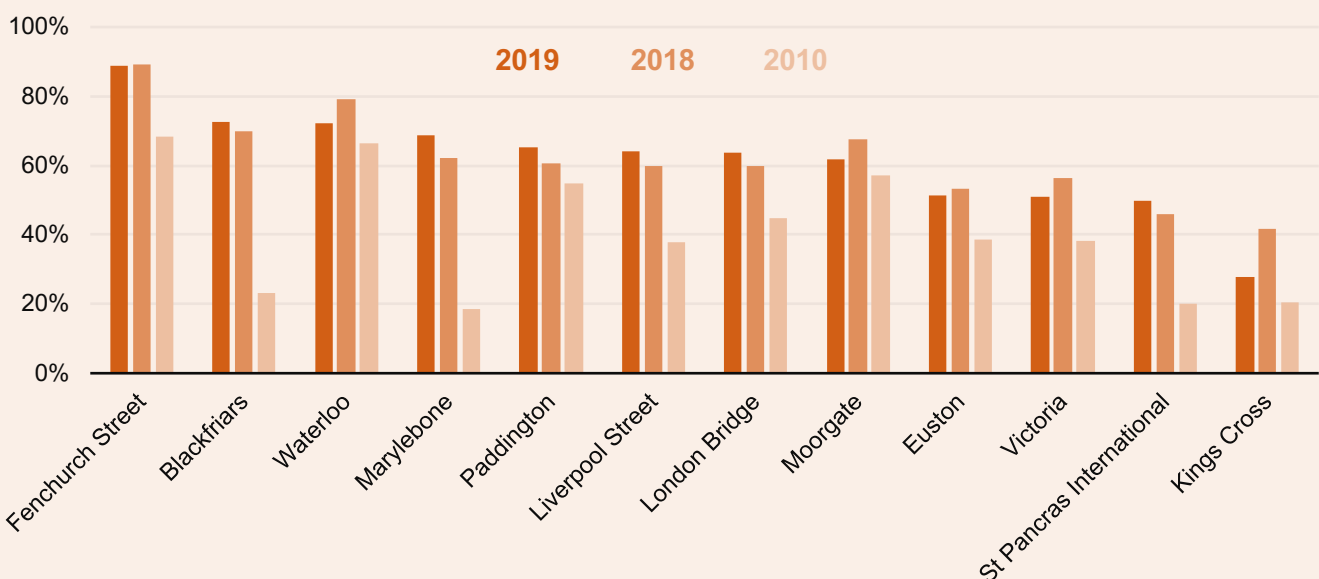
Table 5: Percentage of passengers standing in the AM peak by London station: autumn 2019

Station	% standing	change from 2018 (pp)	change from 2010 (pp)
Blackfriars	31.8%	↓ -0.9	↑ 14.3
Euston	18.2%	↓ -1.6	↑ 8.2
Fenchurch Street	31.7%	↓ 0.0	↑ 13.7
King's Cross	9.1%	↓ -4.0	↑ 6.0
Liverpool Street	24.7%	↑ 0.2	↑ 8.9
London Bridge	22.8%	↑ 0.3	↑ 0.8
Marylebone	16.5%	↑ 3.9	↑ 7.5
Moorgate	26.5%	↑ 3.2	↑ 3.0
Paddington	18.2%	↓ -2.1	↓ -7.1
St Pancras International	16.0%	↓ -1.2	↑ 6.5
Victoria	13.4%	↓ -1.4	↓ -4.2
Waterloo	26.0%	↓ -1.8	↓ -1.1
London total	22.1%	↓ -0.6	↑ 2.8

i The Thameslink programme

The Thameslink programme has provided extra services and capacity linking destinations to the north and south of London, including a new fleet of high capacity trains introduced in 2018. The significant disruption arising from the problematic timetable changes in May 2018 meant some of the timetable improvements were scaled initially back. However with each new timetable change Govia Thameslink Railway have continued to introduce extra services meaning improvements can still be seen when comparing autumn 2019 to the previous year.

Figure 8: AM peak services with standing into London stations, compared with the previous year and 2010

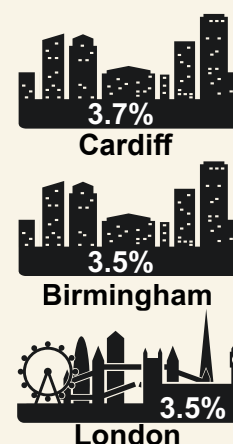


6. Passengers in excess of capacity (PiXC)

Cardiff has the highest level of peak crowding (3.7%) whilst London has the highest number of passengers in excess of capacity

- Nearly 44,000 passengers were in excess of capacity across both peaks in London (3.5%), a decrease of 0.5 pp on the previous year.
- Overall for all cities outside of London, passengers in excess of capacity has remained unchanged.
- However, nine major cities have seen an improvement in PiXC in the last year. Nottingham had the largest decrease in passengers in excess of capacity (down 2.1 pp) whereas Bristol had the largest increase (up 1.2 pp)

Passengers in excess of capacity



i Passenger crowding

Crowding levels, measured using PiXC, are derived from passenger counts at a train's busiest point on route into (AM peak) or out of (PM peak) a city centre.

PiXC statistics show the overall percentage of passengers that exceed each train's capacity.

For example, a train with a capacity of 90 carrying 100 standard class passengers has a PiXC of 10. This is divided by the total number of standard class passengers to give a percentage (10/100 = 10%).

While PiXC is shown as a percentage, there will be large differences in the absolute number of crowded passengers at each city.

Table 6: PiXC across both peaks by city and London station: autumn 2019

City	PiXC	PiXC (%)	change from 2018 (pp)	change from 2010 (pp)
Birmingham	3,600	3.5%	0.1	1.5
Brighton	100	0.8%	-1.3	-
Bristol	700	2.9%	1.2	2.1
Cambridge	500	2.8%	-2.0	-
Cardiff †	1,200	3.7%	-	-
Leeds	1,000	1.9%	-0.1	0.1
Leicester	100	0.9%	-0.7	0.3
Liverpool	100	0.3%	0.2	0.0
Manchester	1,500	2.0%	-0.1	0.0
Newcastle	0	0.1%	-0.2	0.0
Nottingham	0	0.4%	-2.1	0.3
Reading	0	0.0%	-0.4	-
Sheffield	100	0.7%	0.1	-0.8
All cities outside London	9,200	0.9%	0.0	-
Blackfriars	200	0.5%	0.4	-2.7
Euston	3,300	5.4%	0.7	0.4
Fenchurch Street	3,400	4.5%	-0.4	2.0
Kings Cross	2,400	7.3%	1.4	6.1
Liverpool Street	11,100	5.5%	-1.5	1.4
London Bridge	4,900	1.7%	0.3	-0.5
Marylebone	2,100	7.1%	0.7	3.8
Moorgate	0	0.0%	-5.7	-3.0
Paddington	2,700	4.3%	-1.8	-5.6
St Pancras International	3,000	3.5%	-1.6	0.7
Victoria	700	0.5%	-0.4	-1.6
Waterloo	9,800	4.7%	-0.1	1.4
London total	43,700	3.5%	-0.5	0.3
All cities	52,800	3.1%	-0.4	-

Figures in this table are rounded to the nearest 100 passengers and a PiXC of zero indicates less than 50 passengers. Totals may not sum due to rounding. Statistics for Brighton, Cambridge and Reading are only available from 2017. † Methodological changes to Cardiff data mean that the 2019 figure is not directly comparable to previous years.

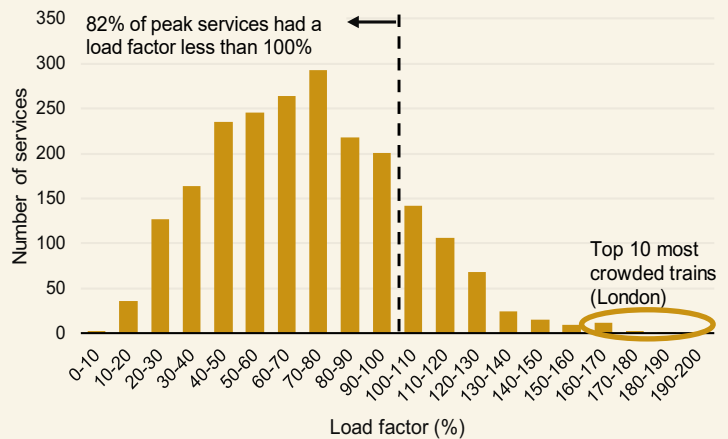
Most overcrowded trains

! These pages look at the loading at the busiest point for the 10 busiest peak trains during the autumn period when passenger numbers tend to be highest. These trains make up a small fraction of all services and do not represent general conditions on the railway. This list looks at train services over the autumn period only.

This list represents less than 0.05% of daily train services

- In 2019-20, over 1.7 billion passenger journeys were made at over 2,500 stations in Great Britain.
- The ten listed services represent less than 0.05% of the average 21,000 train services running on the network on a typical autumn day.

Figure 9: London peak services, autumn 2019



i The load factor shows the number of standard class passengers as a percentage of the maximum allowable standard class passenger capacity at the busiest calling point on route to or from the city centre.

1.	08:02 Oxford to London Marylebone (Chiltern Railways)
Service information	Passengers on this service, formed of 2 carriages, were counted just once during the period, where a load factor of 196% was seen at Marylebone.
Reducing crowding	New Oxford services via Bicester since 2016 have proven popular, particularly from High Wycombe. Constraints on the number of carriages available have limited Chiltern in matching this increased demand. The May 2020 timetable introduced an extra service from High Wycombe in front of this train providing an extra 352 seats into Marylebone.
2.	07:32 Woking to London Waterloo (South Western Railway)
Service information	Passengers on this service, formed of 12 carriages, were counted just once during the period, where a load factor of 182% was seen at Waterloo.
Reducing crowding	This service currently operates with maximum carriages. However, after the count period SWR completed a refurbishment programme on their Class 444 and 450 trains (which operate this service). This refurbishment brings additional capacity to mainline services.
3.	07:38 Enfield Town to London Liverpool Street (London Overground)
Service information	Passengers on this service, formed of 4 carriages, were counted just once during the period where a load factor of 180% was seen at Seven Sisters.
Reducing crowding	Services on this line can operate with up to 8 carriages, however the lack of available units meant this service is formed of 4. TfL are currently introducing new trains on this route, increasing capacity by 10%, and are investigating raising service frequency.
4.	15:08 Weymouth to Gloucester (Great Western Railway)
Service information	Across the period this service, formed of 5 carriages, saw an average load factor of 178% at Keynsham, outside Bristol.
Reducing crowding	Timings of this train, along with other timetable enhancements, were changed in December 2019 to help spread train loadings. Whilst usage is currently low due to COVID-19, GWR expect to provide additional carriages in this area of the network in early 2021.

! **Passenger numbers on individual train services**
 Statistics on individual services are not always robust due to fluctuations in passenger numbers from day to day. These are also more susceptible to measurement errors, particularly as some of these are based on a single daily count. This list should be treated with caution and referenced alongside the aggregate statistics for trends in crowding.

5.	18:30 London Waterloo to Portsmouth Harbour (South Western Railway)
Service information	Passengers on this service, formed of 8 carriages, were counted just once during the period, where a load factor of 174% was seen at Waterloo.
Reducing crowding	Following the introduction of refurbished Class 442 trains, this service will operate with 10 carriages in future timetables. This is in addition to the refurbishment of Class 444 and 450 trains which has brought additional capacity to other services on this route.
6.	05:50 Wolverhampton to London Euston (West Midlands Trains)
Service information	Across the period this service, formed of 12 carriages, saw an average load factor of 171% at Euston.
Reducing crowding	Whilst this service operates the maximum number of carriages, extra Class 350 trains introduced in late 2019 provide additional capacity on routes serving Euston. "Travel More Comfortably" posters at WMT stations now help passengers make an informed choice based on typical crowding levels. Further new rolling stock fleets are expected over the next two years, driving further increases in capacity across their network.
7.	05:43 Portsmouth Harbour to London Waterloo (South Western Railway)
Service information	Passengers on this service, formed of 10 carriages, were counted just once during the period, where a load factor of 169% was seen at Waterloo.
Reducing crowding	From late 2020 this service will operate with 12 carriages and extra capacity. This is in addition to the refurbishment of Class 444 and 450 trains which has brought additional capacity to other services on this route.
8.	07:14 Alton to Waterloo (South Western Railway)
Service information	This service had a load factor of 168%. This information was based on a single daily count.
Reducing crowding	The service currently operates with maximum carriages. However, after the count period SWR completed a refurbishment programme on their Class 444 and 450 trains (which operate this service). This refurbishment brings additional capacity to mainline services.
9.	07:29 Chingford to London Liverpool St. (London Overground)
Service information	Passengers on this service, formed of 4 carriages, were counted just once during the period where a load factor of 166% was seen at Walthamstow
Reducing crowding	Services on this line can operate with up to 8 carriages, however the lack of available units meant this service is formed of 4. TfL are currently introducing new trains on this route, increasing capacity by 10%, and are investigating raising service frequency.
10.	07:16 King's Lynn to King's Cross (Great Northern)
Service information	Across the period this service, formed of 8 carriages, saw an average load factor of 165% at King's Cross.
Reducing crowding	This Cambridge Express arrival (08:09 from Cambridge, 07:16 from King's Lynn) is expected to increase from an 8 to a 12 car train next year providing 50% more seats.

Passenger numbers on individual train services

Statistics on individual services are not always robust due to fluctuations in passenger numbers from day to day. These are also more susceptible to measurement errors, particularly as some of these are based on a single daily count. This list should be treated with caution and referenced alongside the aggregate statistics for trends in crowding.

7. Passenger numbers and crowding in London stations

Peak crowding in London is at its lowest since 2013

- Since 2010, the number of passengers arriving into London during the morning peak has increased by 17%
- Across both peaks, peak crowding levels since 2010 increased to a peak of 4.5% in 2015. For the last four years, peak crowding has decreased. Morning PiXC is at its lowest level since 2014.

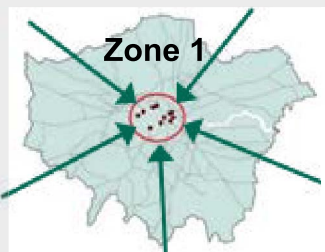
Figure 10: PiXC for train services to and from London, 1990 to 2019



Table 7: Passenger numbers and PiXC at major London stations during the AM peak

AM Peak	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Passenger arrivals	521,200	533,200	536,200	545,300	563,400	581,400	583,400	577,000	596,300	607,400
PiXC	2.0%	4.1%	4.1%	5.4%	5.4%	5.8%	5.7%	5.4%	5.2%	4.5%

AM peak arrivals

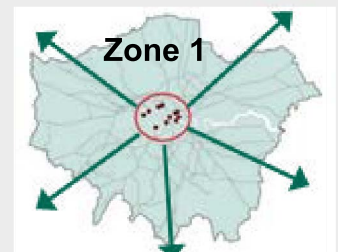


Between 7am and 10am

i Passenger counts in London

Passenger numbers arriving into London are counted on arrival at the first station stop in Zone 1 of the TfL Travelcard area on route to London. For example, services terminating at Charing Cross or Cannon Street will be counted at London Bridge. Conversely, passengers departing London are counted at the final station from which a train departs before leaving Zone 1.

PM peak departures



Between 4pm and 7pm

Several central London stations have experienced large fluctuations in passenger numbers since 2018

- The increase in passenger arrivals was driven by large increases in St Pancras International, Blackfriars and Euston. These changes are linked to the increased services available under the Thameslink programme and new rolling stock.

Table 8: AM peak passenger arrivals and seats by central London station, autumn 2019

Central London Station	Passenger arrivals			Passenger seats		
	Total	change from 2018 (%)	change from 2010 (%)	Total	change from 2018 (%)	change from 2010 (%)
Blackfriars	20,500	↑ 9.5%	↑ 4.6%	15,500	↑ 9.0%	↓ -16.0%
Euston	33,600	↑ 9.4%	↑ 46.6%	35,900	↑ 8.9%	↑ 28.1%
Fenchurch Street	26,600	↓ -0.1%	↑ 12.0%	28,100	↔ 0.0%	↑ 11.3%
King's Cross	15,500	↓ -16.0%	↓ -10.9%	23,500	↑ 3.0%	↓ -6.0%
Liverpool Street	75,100	↑ 0.5%	↑ 16.9%	94,000	↓ -1.6%	↑ 10.1%
London Bridge	159,400	↑ 2.3%	↑ 19.3%	139,500	↑ 3.0%	↑ 17.2%
Marylebone	16,600	↑ 4.7%	↑ 43.9%	15,000	↓ -0.6%	↑ 26.5%
Moorgate	11,800	↓ -6.8%	↓ -8.6%	12,300	↓ -19.6%	↑ 0.1%
Paddington	31,000	↓ -1.6%	↑ 18.7%	32,500	↑ 3.3%	↑ 25.4%
St Pancras International	44,400	↑ 15.5%	↑ 55.2%	46,500	↑ 15.8%	↑ 38.9%
Victoria	59,400	↑ 1.4%	↓ -8.4%	72,500	↔ 0.0%	↑ 9.7%
Waterloo	113,700	↓ -0.6%	↑ 18.7%	93,300	↑ 3.8%	↑ 17.3%
London total	607,400	↑ 1.9%	↑ 16.5%	608,600	↑ 1.5%	↑ 15.2%

King's Cross and St Pancras International

These stations are connected and share an underground station. In autumn 2019, a large decrease in passengers travelling into King's Cross (down 16.0%) coincided with an increase in passengers at St Pancras International (up 15.5%), reflecting a possible change in travel behaviours as a result of additional routes and services due to the Thameslink programme.

Since 2018, a new tunnel north of St Pancras International provides new options to passengers travelling from Peterborough and Cambridge. These services can be a more direct and quicker option into central London. Due to the continuing increase of services by Govia Thameslink Railway, an additional 12 Thameslink trains travelled southbound through St Pancras during the morning peak in autumn 2019 compared to the previous year.

The Thameslink programme

The Thameslink programme has provided extra services and capacity in London. Starting in 2009, passenger numbers at Blackfriars, London Bridge, St Pancras and King's Cross have seen year-on-year fluctuations as journeys were rerouted through these stations.

Blackfriars/ London Bridge

As with the North London stations (e.g. St Pancras International), Govia Thameslink Railway (GTR) introduced a number of new services in the south of London including additional trains travelling from Brighton through to Cambridge.

From autumn 2019 an extra 11 Thameslink trains travelled northbound through London Blackfriars or London Bridge in the morning peak each day compared to autumn 2018, along with an additional 5,000 seats.

8. Autumn 2019 summary statistics

Table 9: Summary statistics across the peaks, with the change since autumn 2018

City/Station	Peak passengers		Total peak seats	Passengers standing		PiXC			
	arriving and departing								
Birmingham	101,400	↑ 4.7%	113,400	↑ 5.9%	16.4%	↓ -0.7	3.5%	↑ 0.1	
Brighton	16,700	↑ 1.5%	42,200	↑ 10.8%	6.2%	↓ -0.8	0.8%	↓ -1.3	
Bristol	23,000	↑ 15.8%	34,700	↑ 10.2%	6.3%	↑ 2.4	2.9%	↑ 1.2	
Cambridge	18,500	↑ 5.0%	41,100	↑ 15.8%	12.6%	↓ -1.3	2.8%	↓ -2.0	
Cardiff †	32,900	-	48,900	↑ 5.3%	11.8%	-	3.7%	-	
Leeds	55,400	↑ 1.8%	61,900	↑ 0.1%	15.3%	↑ 0.7	1.9%	↓ -0.1	
Leicester	13,300	↓ -2.5%	22,000	↓ -0.1%	3.1%	↓ -0.8	0.9%	↓ -0.7	
Liverpool	45,000	↓ -0.4%	67,600	↑ 2.4%	7.5%	↑ 2.5	0.3%	↑ 0.2	
London total	1,119,400	↑ 1.3%	1,201,100	↑ 2.0%	18.8%	↓ -0.6	3.5%	↓ -0.5	
Manchester	71,900	↑ 0.7%	98,000	↑ 0.4%	10.2%	↑ 0.5	2.0%	↓ -0.1	
Newcastle	11,300	↓ -0.4%	22,900	↑ 3.2%	3.1%	↑ 0.4	0.1%	↓ -0.2	
Nottingham	10,500	↑ 0.9%	15,400	↓ -1.7%	6.6%	↑ 0.2	0.4%	↓ -2.1	
Reading	53,700	↑ 0.7%	109,800	↑ 6.1%	1.2%	↓ -1.1	0.0%	↓ -0.4	
Sheffield	17,300	↓ -0.4%	25,600	↓ -0.4%	4.5%	↓ -0.2	0.7%	↑ 0.1	
Central London stations:									
Blackfriars	35,400	↑ 6.9%	30,400	↑ 6.0%	25.4%	↓ -0.5	0.5%	↑ 0.4	
Euston	64,100	↑ 7.2%	72,500	↑ 8.3%	17.4%	↓ -0.9	5.4%	↑ 0.7	
Fenchurch Street	50,400	↑ 0.2%	53,700	↓ -0.6%	30.2%	↑ 0.2	4.5%	↓ -0.4	
King's Cross	31,800	↓ -13.5%	46,600	↑ 2.4%	9.1%	↓ -1.4	7.3%	↑ 1.4	
Liverpool Street	142,300	↓ -1.5%	185,000	↓ -1.8%	21.7%	↓ -0.5	5.5%	↓ -1.5	
London Bridge	285,500	↑ 1.9%	272,200	↑ 2.0%	18.6%	↑ 0.5	1.7%	↑ 0.3	
Marylebone	29,800	↑ 0.4%	29,800	↑ 0.7%	12.4%	↑ 1.2	7.1%	↑ 0.7	
Moorgate	21,400	↓ -5.3%	24,300	↓ -19.6%	22.2%	↑ 2.7	0.0%	↓ -5.7	
Paddington	58,200	↑ 0.5%	66,300	↑ 4.2%	14.0%	↓ -1.4	4.3%	↓ -1.8	
St Pancras	83,200	↑ 12.2%	93,000	↑ 14.5%	12.6%	↓ -1.8	3.5%	↓ -1.6	
Victoria	111,700	↑ 1.5%	144,900	↔ 0.0%	10.4%	↓ -1.1	0.5%	↓ -0.4	
Waterloo	205,600	↓ -0.1%	182,500	↑ 2.8%	22.9%	↓ -1.7	4.7%	↓ -0.1	

† Methodological changes to how missing passenger counts data is estimated mean that passenger demand at Cardiff is not directly comparable to previous years.

Contextual information for each city

Birmingham

West Midlands Trains have introduced an additional 10 new services arriving into Birmingham in the AM peak since autumn 2018, with around 2,500 extra seats arriving between 7am and 10am. Since autumn 2019, West Midlands Trains have introduced a further ten class 350 rolling stock units allowing capacity to be further strengthened.

Brighton

Compared to last year, Govia Thameslink Railway have introduced 5 additional services arriving into Brighton in the morning peak, including 4 Cambridge - Brighton services, a new route which opened following the Thameslink project. This translates to an extra 2,000 seats into Brighton in the AM peak.

Bristol

The government led Intercity Express Programme has brought new rolling stock to intercity Great Western services into Bristol. Compared to 2017, GWR provide an extra 2,000 seats to Bristol in the morning peak (a 17% increase). Additional non-stop services to Bristol are reducing journey times and adding additional capacity.

Cambridge

Following the Thameslink Project, Govia Thameslink Railway have brought in an additional 5 AM peak arrivals since last year, including two services from Brighton, bringing an extra 2,500 seats to Cambridge. The East Coast Mainline upgrade which began in mid 2019 will facilitate longer trains on this route as well as a modified timetable to spread passenger loading more evenly.

New Greater Anglia rolling stock is currently being brought in, providing additional capacity across the entire Greater Anglia route.

Cardiff

The government led Intercity Express Programme has brought new rolling stock to intercity Great Western services into Cardiff. Compared to 2017, Class 800 trains bring an additional 800 seats to Cardiff in the AM peak. TfW are currently introducing modernised class 170 trains bringing additional seats into Cardiff on the Ebbw Vale line.

Leeds

New class 195 and class 331 trains, replacing pacers, began to enter service at Leeds from 2018, bringing extra capacity.

The government led Intercity Express Programme also brought new stock to London North Eastern services into Leeds. Compared to 2017, Azuma trains bring an additional 300 seats to Leeds in the AM peak.

New TPE "Nova" trains began service in late 2019 and continue to be introduced, bringing increased capacity on routes to Liverpool, Newcastle and Edinburgh.

Leicester

East Midlands Railway are currently expecting to replace much of their existing train fleet within the next 3 years, including introducing new Hitachi Class 810s, bringing additional capacity to the Intercity Midland Mainline.

Liverpool

Merseyrail operated an extra two services into central Liverpool in the morning peak compared to last year. They are currently in the process of replacing their entire fleet with Class 777 trains which will bring extra capacity and more comfortable standing. New class 195 trains, replacing pacers, began to enter service at Liverpool from 2018, bringing extra capacity.

Manchester

Northern introduced new class 195 trains to phase out pacers on Manchester routes, driving an increase in capacity at Manchester compared to autumn 2018.

New TPE “Nova” trains began service on trains in late 2019 and continue to be introduced, bringing increased capacity on many Manchester routes.

Newcastle

The phasing out of pacers at Newcastle has coincided with the introduction of an additional 350 seats on Northern trains in the AM peak (a 15% increase) compared to autumn 2018.

The government led Intercity Express Programme also brought new stock to London North Eastern services into Newcastle. Compared to 2017, Class 800 Azuma trains enable an extra 450 seats into Newcastle in the AM peak.

Nottingham

East Midlands Railway are currently expecting to replace much of their existing train fleet within the next 3 years, including introducing new Hitachi Class 810s, bringing additional capacity to the Intercity Midland Mainline.

Reading

From December 2019, TfL Rail began operating services between Paddington and Reading in the next steps in the delivery of Elizabeth line. These new services, operated by modern Class 345 trains, replace some GWR services as well as introducing additional services.

The government led Intercity Express Programme has brought new rolling stock to intercity Great Western services into Cardiff. Compared to 2017, GWR provide an extra 8,500 seats to Reading in the morning peak (a 22% increase).

Sheffield

Whilst pacers continued to serve Sheffield during the autumn 2019 count period, these continued to be rapidly phased out in 2020, bringing new capacity to the network.

East Midlands Railway are currently expecting to replace much of their existing train fleet within the next 3 years, including introducing new Hitachi Class 810s, bringing additional capacity to the Intercity Midland Mainline.

9. Technical information

Strengths and weaknesses of the data

The statistics on rail passenger demand and crowding are based on counts carried out by train operators of the numbers of passengers using their services, either using automatic counting equipment fitted to trains or manual counts carried out on board trains or at stations. While the statistics should be a reliable guide to the magnitude of passenger numbers at particular locations and at different times of day, a number of factors can affect these statistics:

- Passenger numbers on individual train services fluctuate from day to day and may vary across the autumn period. This can have an impact on the aggregate statistics, depending on the sample of days each year on which passengers are counted. This particularly affects cases when counts are based on a small number of services or where services have only been counted a small number of times, as changes from year to year may reflect these fluctuations rather than a genuine trend. For the same reason, small differences in the crowding figures between routes or when comparing different years should be treated with caution.
- Passenger counts can be subject to measurement errors. For example with manual counts there is a risk of human error leading to incorrect counts, particularly on busy trains. Load-weighting equipment calculates the passenger load by assuming an average weight per passenger, which may not always be representative of the passengers on every train, and all automatic counting equipment can sometimes develop faults.
- The statistics are designed to represent a typical weekday during school term time in the autumn and may not be representative of other times of year, or on particular days of the week. They will also not reflect crowding seen on days when there was disruption. The autumn period is used because it is the time of year when commuter demand is generally at its greatest, but this will not necessarily be the case for all operators and on all routes, and crowding may be higher at other times of year or on particular days of the week in some cases.
- The basis on which standing allowances for different types of rolling stock are calculated can vary between train operators, usually because of the types of rolling stock in their fleets and the types of passenger services they provide. The method for calculating them has also varied over time. This will have an impact on the PiXC figures for each operator.
- Because some services include a standing allowance in their standard class capacity while longer distance services only include the number of standard class seats, the nature of PiXC is different in these cases. On services with no standing allowance it represents passengers having to stand for more than 20 minutes, whereas on services with a standing allowance, it represents passengers standing in cramped conditions.

More information about the methodology behind these statistics and factors that affect them can be found in the notes and definitions document that accompanies this statistical series: <https://www.gov.uk/government/publications/rail-statistics-guidance>.

Future of crowding data

In light of the COVID-19 pandemic, the DfT recognises a need to collect more detailed demand and crowding information. New and alternative sources to capture greater insights to demand and crowding, such as mobile phone data, are currently being considered. Meanwhile, the DfT continues to require the increased fitment of automatic counting equipment to trains.

Tables accompanying this release

Ten tables have been published alongside this release, three showing passenger number statistics and seven showing crowding statistics. The tables are listed below and can be found at the following link: <https://www.gov.uk/government/statistical-data-sets/rai02-capacity-and-overcrowding>

Passenger number statistics tables

Table no.	Table title
RAI0201	City centre peak and all day arrivals by rail on a typical autumn weekday, by city: annual from 2010
RAI0202	City centre arrivals and departures by rail on a typical autumn weekday afternoon, by city and time band: annual from 2011
RAI0203	Central London arrivals and departures by rail on a typical autumn weekday afternoon, by city and time band: annual from 2011

Crowding statistics tables

Table no.	Table title
RAI0209	Passengers in excess of capacity (PiXC) on a typical autumn weekday by city: annual from 2011
RAI0210	Passengers in excess of capacity (PiXC) on a typical autumn weekday on London and South East train operators' services: annual from 1990
RAI0211	Passengers in excess of capacity (PiXC) on a typical autumn weekday by operator: London and South East train operators: annual from 2000
RAI0212	Peak rail capacity, standard class critical loads and crowding on a typical autumn weekday by city: annual from 2010
RAI0213	Peak rail capacity, standard class critical loads and crowding on a typical autumn weekday in London by terminal: annual from 2010
RAI0214	Peak crowding on a typical autumn weekday by city and train operator: annual from 2011
RAI0215	Peak crowding on a typical autumn weekday in London by terminal and train operator: annual from 2011

Revisions

Following a change of methodology used for calculating PiXC where estimations of first class passengers were applied, revisions have been made to the back-series of PiXC statistics from 2011 to 2014. More information on these revisions can be found here:

<https://www.gov.uk/guidance/rail-statistics-information>

Background notes

Further details about all the statistics in this report can be found in the [notes and definitions](#).

The United Kingdom Statistics Authority [designated these statistics as National Statistics in 2013](#), in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and;
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed. The continued designation was confirmed in October 2017: <https://www.gov.uk/government/publications/national-statistics-status-of-rail-passenger-numbers-and-crowding-statistics/>

Details of Ministers and officials who receive pre-release access to these statistics up to 24 hours before release can be found in the [pre-release access list](#).

Users and uses of these statistics

These statistics and the underlying passenger counts are used within Government and across the rail industry for a wide variety of purposes. Some of the main uses include:

- Informing Government policy on rail, including decisions on infrastructure, station and rolling stock investment
- As part of the rail franchising process, informing the specification of new franchises and the models used in the assessment of franchise bids.
- In the day to day running of train operating companies, including planning timetables and rolling stock deployment
- Understanding and monitoring passenger demand and crowding
- Validating models of passenger demand.

A summary of feedback received from users in 2013 is published on the DfT rail statistics notes and guidance webpage: <https://www.gov.uk/guidance/rail-statistics-information>

10. Get in touch

We are always keen to hear how these statistics are used and would welcome your views on this publication. Comments and queries can be addressed to rail.stats@dft.gov.uk.



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