



Department  
for Transport

## Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2017

### About this release

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

The statistics are based on passenger counts carried out in autumn 2017.

They represent passengers on National Rail services on a 'typical' weekday.

More information is available in the accompanying [notes and definitions](#) document.



St Pancras International

**In autumn 2017, rail passenger numbers fell in many major cities, including London. Crowding levels in London also fell during the peaks, but increased overall in other major cities.**

### Main results



### Passenger Numbers

- In line with the fall in rail journeys across GB, daily rail passengers fell in Leeds, Liverpool, London and Manchester between 2016 and 2017, while passengers numbers in several other major cities increased.
- Over 1 million passengers arrived into London on a typical day, with 55% arriving in the morning peak. Birmingham, the second busiest city, had eight times fewer daily arrivals than London with 128,100.
- While the number of rail passengers fell during the day, morning peak passengers increased overall for all major cities outside of London.

### Morning peak crowding








- Crowding in 2017, measured using PiXC, was highest in London (5.4%), followed by Cambridge (4.8%) and Manchester (4.3%).
- For major cities, crowding levels have not shown a clear pattern but on balance, crowding has increased outside of London, and has fallen in London.
- King's Cross had the highest crowding levels in the morning (9.0%) and the afternoon peaks (5.6%) of the central London stations in 2017.
- In the 2017 morning peak, 23% of passengers were standing on trains arriving into London, and for Blackfriars this was 36%.

**Passengers in excess of capacity (PiXC)** measures crowding levels as the percentage of standard class passengers above capacity at a service's busiest point.

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FURTHER INFORMATION: Media: 020 7944 4459; Public: 020 7944 2419

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# 1. Introduction

This publication presents information on rail passenger numbers and crowding during a typical autumn weekday in 2017 for fourteen major cities across England and Wales, as well as central London stations. A short separate feature is included on rail travel in Scotland.

## Context

This publication begins with an overview of recent trends in rail usage and passenger satisfaction with crowding levels, which provides a wider context to help explain the crowding statistics. This contextual information is from previously published rail statistics.

## Scope

Rail usage tends to be concentrated in the morning peak for trains arriving into city centres, and in the afternoon peak for trains departing from city centres, so these tend to be the times when train crowding is highest. These statistics present morning and afternoon peak totals to show the extent of demand and crowding in major cities across England and Wales, and for the first time in the series, statistics for Brighton, Cambridge and Reading are included.

These statistics are based on counts of rail passengers using passenger train operators' services. The count period in autumn covers services as set out in the timetable introduced in the preceding May. Data are collected for trains entering and leaving a selection of major cities across England and Wales. The statistics represent rail travel during a 'typical' midweek day in the autumn period, that is, excluding days when there was disruption.

## Interpreting the statistics

The statistics on passenger numbers show the total level of rail demand for each city centre. The 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.

The crowding statistics show levels of passenger crowding on routes into cities. Passengers are counted at the busiest station on the route when entering or leaving the city centre.

While rail passenger demand is highest in London, the city also has more train services compared to other cities. Crowding levels reflect times when capacity provision has not met the level of passenger demand, and varies by route and time of day.

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.

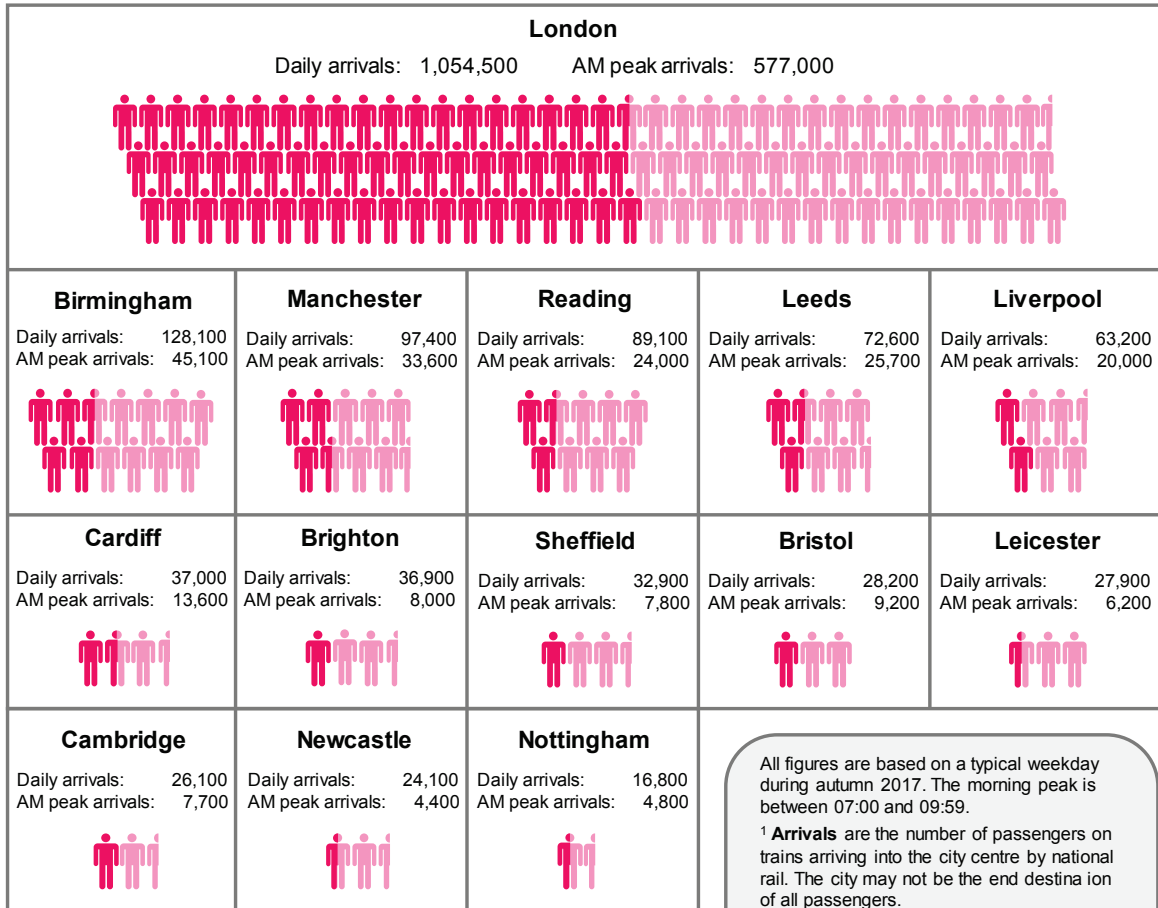


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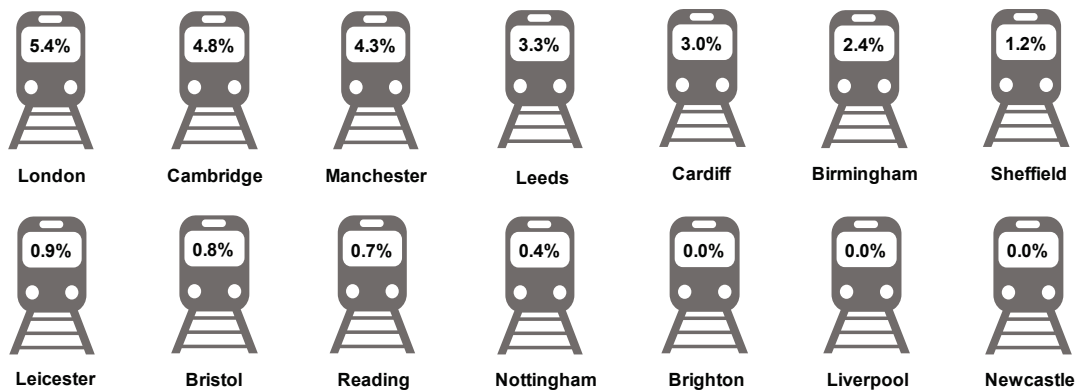
### Rail passenger numbers and crowding into selected cities: 2017



Rail passenger arrivals<sup>1</sup> during a typical autumn weekday:



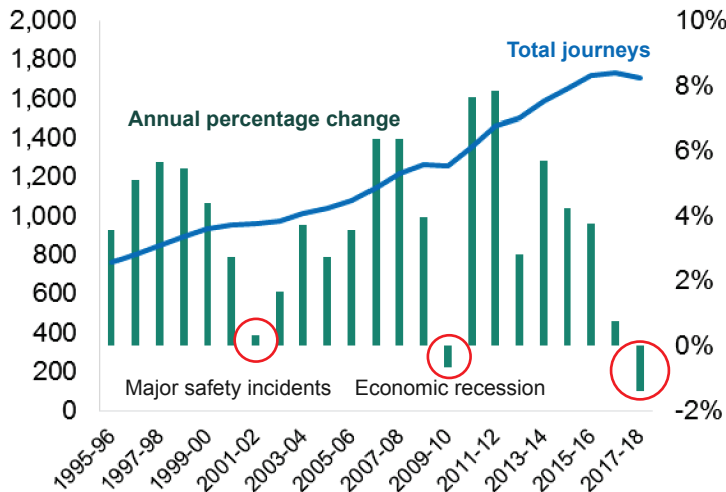
Train crowding<sup>2</sup> during the morning peak:



### 3. Rail passenger journeys in Great Britain

Rail journeys in Great Britain have more than doubled over two decades

**Chart 1: Rail passenger journeys for franchised train operators in Great Britain<sup>1</sup>**



**Decline in 2017-18**

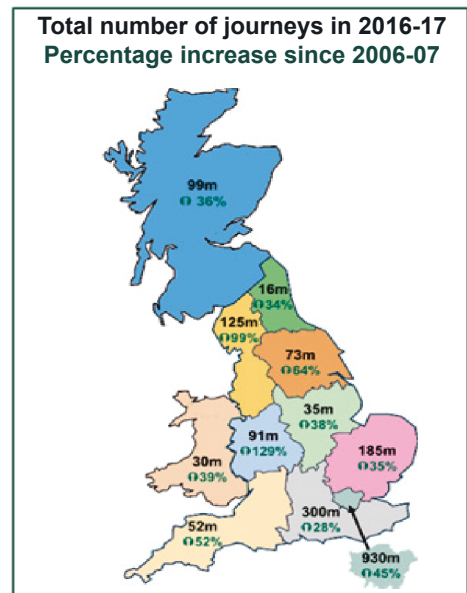
- Substantial planned engineering work over the Christmas period in 2017.
- Three weeks of engineering works at Waterloo, the busiest station in the country.
- Severe weather disrupted services in February 2018.
- Industrial action throughout the year caused major disruption for several train operating companies.

Since the mid-1990s there has been almost unbroken growth in rail journeys, and in 2016-17 journey numbers reached a record high. However, over the last year rail journeys fell by 1.4%, mostly in London and the South East.

**Rail travel by region of Great Britain<sup>1</sup>**

In London, the most populous region also with the highest population density, more rail journeys were made in 2016-17 than all other regions of Great Britain combined. Between 2006-07 and 2016-17, the West Midlands, North West and West Yorkshire saw the fastest growth in rail usage.

These regional differences tend to reflect the levels of urbanisation within them. Areas with higher urban population densities are less reliant on car usage and more reliant on public transport, walking and cycling.



**Table 1: Percentage of trips by mode and settlement type<sup>2</sup>**

	Walk & bicycle	Car	Bus	London Underground	Surface Rail	Other
Urban Conurbation	26%	55%	10%	3%	4%	3%
Urban City and Town	27%	65%	4%	0%	1%	2%
Rural Town and Fringe	24%	69%	3%	0%	1%	2%
Rural Village, Hamlet and Isolated Dwelling	15%	80%	2%	0%	1%	2%

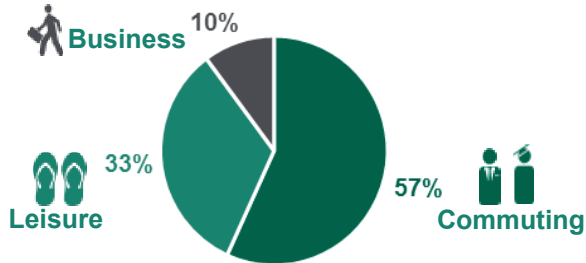
<sup>1</sup>Office of rail and road; <sup>2</sup>DfT – National Travel Survey



## 4. Why people travel by rail

Over half of all rail trips were for commuting (including for education), around one third were for leisure, and the remainder were business travel

Chart 2: Rail trips by mode, England 2016<sup>2</sup>



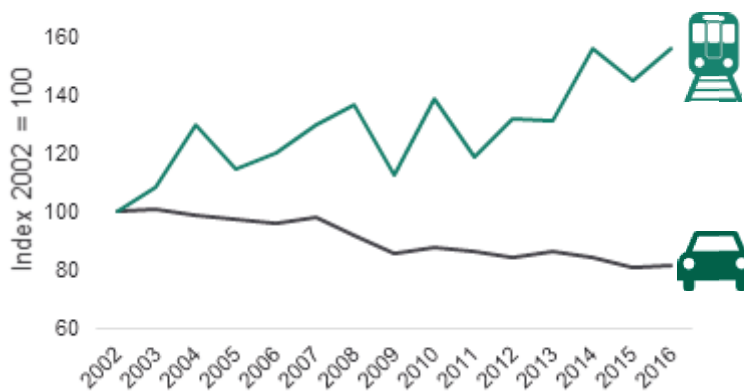
### Who uses rail?

Rail travel is most common among:

- Males aged between 21 and 49
- Higher income earners and those in professional or managerial occupations

Rail commuting trips have increased by over 50% between 2002 and 2016. Not only has there been an increase in rail commuting trips per person over this period, but rail has increasingly been the preferred choice for commuting as fewer commuting trips are made by car.

Chart 3: Index of commuting trips by mode<sup>2</sup>



### Local Authorities with the highest percentage of residents who use rail for commuting 2016<sup>3</sup>

Elmbridge (Surrey)	65%
Bromley (Greater London)	58%
Brentwood (Essex)	56%
St Albans (Hertfordshire)	51%
Bexley (Greater London)	49%
Greenwich (Greater London)	45%
Havering (Greater London)	44%
Sutton (Greater London)	44%
Lewisham (Greater London)	44%
Richmond upon Thames (Greater London)	44%

Rail commuting is more prevalent in London than any other region. In 2016, over one in five (22%) commuters to London used rail as their usual method to travel to work, compared with only 6% across Great Britain. However, those using rail to commute has increased in other regions.

Table 2: Commuters who use rail as their usual method, by region of workplace<sup>3</sup>

	Change		
	2002	2016	(percentage points)
North East	*	2%	-
North West	2%	3%	1.7
Yorkshire and The Humber	1%	3%	2.6
East Midlands	*	1%	-
West Midlands	2%	3%	1.2
East of England	2%	3%	0.8
London	17%	22%	5.1
South East	3%	4%	1.0
South West	1%	2%	1.1

\*low sample size

<sup>2</sup>DfT – National Travel Survey; <sup>3</sup>ONS Labour Force Survey

## 5. Rail passenger satisfaction

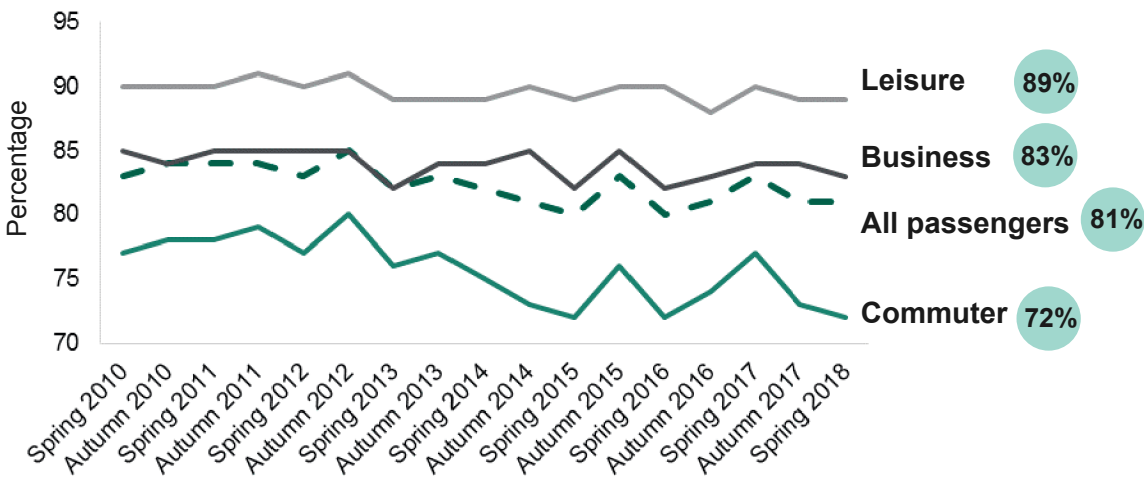
**Commuters are most likely to experience train crowding, and are less satisfied than other passengers with this aspect of a journey**

Transport Focus publishes bi-annual rail passenger satisfaction scores that consistently show the proportion of commuter journeys rated as satisfactory is lower than for other types of journeys.



Passenger satisfaction is measured by Transport Focus' National Rail Passenger Survey (NRPS).

**Chart 4: Overall satisfaction with journey, by journey purpose<sup>4</sup>**



In particular, all groups of passengers were less satisfied with crowding levels than they were overall. Research shows that the ability to get a seat on a train is the second highest priority for improvement among rail passengers, with better value for money for tickets in first place<sup>5</sup>.



	Commuters	Business	Leisure	All journeys
Overall satisfaction	72%	83%	89%	81%
Satisfaction with crowding levels	56%	77%	83%	70%

Satisfaction with crowding levels varies for commuters across the country, and is particularly low for some central London stations.

**Table 3: Commuter satisfaction by selected destination; Spring 2018<sup>4</sup>**

	Victoria	London Bridge	Liverpool Street	Paddington	Birmingham New Street	Leeds
<b>Overall satisfaction</b> (national average: 72%)	59%	70%	66%	62%	72%	70%
<b>Satisfaction with crowding</b> (national average: 56%)	53%	55%	54%	38%	56%	55%

<sup>4</sup>Transport Focus: National Rail Passenger Survey (NRPS); <sup>5</sup>Transport Focus, [Rail passengers' priorities for improvement in Great Britain](#), 2017

## 6. Passenger numbers summary: 2017



### Rail demand increased in most major cities, but fell in London

We now turn to the latest DfT passenger numbers and crowding statistics, which focus on major cities in England & Wales. This section presents numbers of rail passengers travelling on trains to and from selected major cities in England and Wales on a typical autumn weekday, as well as central London stations.

**Table 4: Passenger arrivals and departures by city and London station: Autumn 2017**

City	All day passengers		AM peak arrivals		PM peak departures	
	Total	Change from 2016	Total	Change from 2016	Total	Change from 2016
Birmingham	252,500	↑3.3%	45,100	↑6.7%	46,600	↑3.2%
Brighton	70,000	-	8,000	-	9,300	-
Bristol	59,200	↑3.7%	9,200	↓0.5%	10,300	↑6.1%
Cambridge	51,900	-	7,700	-	8,800	-
Cardiff	75,200	↑0.1%	13,600	↑1.6%	14,100	↓1.3%
Leeds	143,200	↓3.4%	25,700	↓9.8%	26,300	↓7.0%
Leicester	56,500	↑2.0%	6,200	↑8.3%	6,900	↓0.4%
Liverpool	123,900	↓4.3%	20,000	↓4.9%	21,700	↓3.9%
Manchester	192,500	↓3.8%	33,600	↑1.7%	33,700	↓3.6%
Newcastle	48,200	↑0.8%	4,400	↓1.3%	6,100	↓0.5%
Nottingham	33,100	↑4.5%	4,800	↑5.1%	5,400	↑9.0%
Reading	177,300	-	24,000	-	25,400	-
Sheffield	66,000	↑1.7%	7,800	↑4.0%	9,400	↑2.7%
<b>All cities outside London</b>	<b>1,349,600</b>	<b>↓0.4%</b>	<b>210,300</b>	<b>↑0.4%</b>	<b>434,300</b>	<b>↓0.9%</b>
<b>Central London station</b>						
Blackfriars	78,100	↓16.1%	25,200	↓17.9%	18,000	↓12.3%
Euston	164,100	↑0.2%	30,900	↑0.9%	30,000	↑0.3%
Fenchurch Street	71,800	↑2.4%	26,200	↑3.1%	23,000	↑2.6%
King's Cross	111,500	↑7.4%	22,100	↓3.2%	24,200	↑8.9%
Liverpool Street	235,400	↑2.2%	71,500	↓0.5%	65,100	↓6.8%
London Bridge	403,000	↑1.3%	136,100	↑2.3%	107,800	↓1.0%
Marylebone	55,300	↑6.3%	15,100	↑8.2%	13,000	↑1.8%
Moorgate	31,500	↓5.2%	12,800	↓1.0%	9,100	↓8.7%
Paddington	120,400	↓0.5%	28,000	↑5.6%	23,700	↑1.5%
St. Pancras	143,100	↓4.2%	35,700	↓1.5%	30,800	↓8.5%
Victoria	250,300	↓5.6%	62,800	↓4.6%	54,300	↓5.3%
Waterloo	419,600	↓4.1%	110,700	↓2.6%	87,400	↓3.0%
<b>London total</b>	<b>2,084,100</b>	<b>↓1.6%</b>	<b>577,000</b>	<b>↓1.1%</b>	<b>486,500</b>	<b>↓2.9%</b>
<b>All cities</b>	<b>3,433,800</b>	<b>↓1.2%</b>	<b>787,400</b>	<b>↓0.7%</b>	<b>710,500</b>	<b>↓2.4%</b>

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 are presented this year for the first time in the series. Changes in passenger numbers for all cities therefore do not include these cities.



## What are on-train crowding statistics?

As well as passenger numbers statistics presented on the previous page, this release presents statistics on passenger crowding levels on trains at the busiest point along their routes into city centres. There are two key measures of crowding that are used in these statistics:

1. **Passengers standing (%)** – Passengers standing is the number of passengers who are in excess of seats. It is represented by passengers standing as a percentage of the total number of passengers travelling.
2. **Passengers in Excess of Capacity (PiXC)** – PiXC is a crowding metric that has historically been used by the DfT to monitor crowding levels. It is defined as the number of standard class passengers who are in excess of total capacity (standard class seats plus a standing allowance), as a percentage of the total number of standard class passengers travelling.

## How do passenger numbers differ from crowding?

Put simply, passenger numbers are counts of rail passengers travelling on trains to city centre stations, whereas crowding statistics measure how heavily used the train services are.

Passenger numbers are taken from counts conducted on trains at the city centre stations themselves, whereas crowding statistics are derived from passenger counts at the busiest point during a train's journey into and out of the city centre.

Crowding statistics look at standard class passengers only as first class passengers would have an expectation of getting a seat. The passenger numbers include both standard and first class passengers as they measure overall passenger demand.

## How do passenger numbers impact the crowding statistics?

Of those included in these statistics, seven major cities across England and Wales saw the number of daily rail passengers grow between 2016 and 2017. In 2017, 56,000 additional passengers travelled into London during a typical autumn weekday AM peak than in 2010, an increase of 11%.

Along with a rise in passenger numbers, crowding levels have worsened in recent years. Between 2010 and 2017 there was an increase of 1.4 percentage points in morning peak PiXC in London.

PiXC takes into account demand and capacity, so a city or station with few passengers and train services could have a higher PiXC score than one with many more passengers and services.

Although variations in PiXC 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 percentage rise in crowding levels can translate into a large number of passengers experiencing crowded conditions overall.

## 7. Passenger standing summary: 2017

This section presents information about the levels of standing passengers on train routes into city centres.

Passengers are counted at the busiest stations on train routes into and out of city centres when the numbers standing can be most accurate. On some routes, particularly those that serve commuters, train companies use rolling stock that is designed with a higher capacity of standing space.

### Passengers standing

Standing passengers are counted on the train at the busiest point on the route into the city centre during the AM peak and out of the city centre during the PM peak.

**Table 5: Standing passengers by city and central London station: Autumn 2017**

City	AM peak		PM peak	
	% standing	Change from 2016	% standing	Change from 2016
Birmingham	15%	↓0.9	12%	↓1.0
Brighton	7%	-	5%	-
Bristol	3%	↓6.6	7%	↓4.3
Cambridge	16%	-	14%	-
Cardiff	12%	↓0.5	10%	↓2.2
Leeds	12%	↓3.8	10%	↓2.1
Leicester	1%	↓0.7	7%	↓0.5
Liverpool	3%	↓1.6	2%	↓0.9
Manchester	15%	↓1.0	10%	↓1.1
Newcastle	3%	↓0.2	4%	↓0.4
Nottingham	3%	↓0.5	6%	↓2.3
Reading	3%	-	1%	-
Sheffield	5%	↓0.5	5%	↓0.6
<b>All cities outside London</b>	<b>11%</b>	<b>↓0.6</b>	<b>9%</b>	<b>↓0.3</b>
<b>Central London station</b>				
Blackfriars	36%	↓4.8	28%	↓5.8
Euston	19%	↓1.2	18%	↓2.0
Fenchurch Street	31%	↓3.1	26%	↓4.1
King's Cross	17%	↓0.1	14%	↓2.0
Liverpool Street	22%	↓3.3	15%	↓3.1
London Bridge	21%	↓0.7	12%	↓2.1
Marylebone	11%	↓5.4	5%	↓0.1
Moorgate	25%	↓3.3	10%	↓2.0
Paddington	11%	↓0.4	5%	↓4.7
St. Pancras	24%	↓2.9	15%	↓3.1
Victoria	19%	↓4.6	14%	↓0.9
Waterloo	29%	↓1.2	21%	↓1.3
<b>London total</b>	<b>23%</b>	<b>↓0.0</b>	<b>16%</b>	<b>↓0.5</b>
<b>All cities</b>	<b>20%</b>	<b>↓0.2</b>	<b>14%</b>	<b>↓0.5</b>

Statistics for Brighton, Cambridge and Reading are presented this year for the first time in the series. Changes in passenger numbers for all cities therefore do not include these cities.

### Crowding levels have fallen in London, but outside of London crowding has risen across the peaks

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.

#### Passenger crowding

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

**Table 6: PiXC by city and London station: Autumn 2017**

City	AM peak		PM peak		Both peaks	
	PiXC	Change from 2016	PiXC	Change from 2016	PiXC	Change from 2016
Birmingham	2.4%	↑1.1%	1.5%	↑0.6%	2.0%	↑0.9%
Brighton	0.0%	-	0.2%	-	0.1%	-
Bristol	0.8%	↑1.9%	2.1%	↑0.5%	1.5%	↑1.2%
Cambridge	4.8%	-	3.8%	-	4.3%	-
Cardiff	3.0%	↑0.7%	2.2%	↑0.8%	2.6%	↑0.8%
Leeds	3.3%	↑0.6%	1.7%	↑0.4%	2.5%	↑0.1%
Leicester	0.9%	↑0.9%	4.1%	↑0.5%	2.6%	↑0.6%
Liverpool	0.0%	↔0.0%	0.0%	↔0.0%	0.0%	↔0.0%
Manchester	4.3%	↑0.8%	2.2%	↑0.3%	3.2%	↑0.2%
Newcastle	0.0%	↔0.0%	4.0%	↑3.9%	2.4%	↑2.3%
Nottingham	0.4%	↑0.1%	1.1%	↑0.9%	0.8%	↑0.5%
Reading	0.7%	-	0.2%	-	0.5%	-
Sheffield	1.2%	↑0.1%	0.8%	↑0.4%	1.0%	↑0.3%
<b>All cities outside London</b>	<b>2.2%</b>	<b>↑0.3%</b>	<b>1.5%</b>	<b>↑0.1%</b>	<b>1.9%</b>	<b>↑0.2%</b>
<b>Routes into major London stations</b>						
Blackfriars (via Elephant and Castle)	4.5%	↑9.9%	2.6%	↑6.2%	3.7%	↑8.4%
Euston	4.6%	↑0.2%	4.0%	↑0.7%	4.3%	↑0.4%
Fenchurch Street	5.9%	↑0.2%	2.3%	↑0.5%	4.2%	↑0.3%
King's Cross	9.0%	↑2.0%	5.6%	↑1.7%	7.3%	↑1.8%
Liverpool Street	7.0%	↑0.9%	3.9%	↑0.4%	5.6%	↑0.3%
London Bridge	4.2%	↑0.3%	0.1%	↑0.3%	2.4%	↑0.3%
Marylebone	7.9%	↑4.3%	3.4%	↑1.0%	5.9%	↑2.8%
Moorgate	7.7%	↑1.6%	0.2%	↑1.3%	4.4%	↑0.5%
Paddington	4.9%	↑2.2%	2.3%	↑4.3%	3.7%	↑3.2%
St. Pancras	1.8%	↑2.6%	3.3%	↑1.9%	2.5%	↑2.3%
Victoria	2.7%	↑2.7%	0.9%	↑0.2%	1.8%	↑1.5%
Waterloo	7.0%	↑2.4%	4.8%	↑1.5%	6.0%	↑2.0%
<b>London total</b>	<b>5.4%</b>	<b>↑0.3%</b>	<b>2.7%</b>	<b>↑0.4%</b>	<b>4.1%</b>	<b>↑0.3%</b>
<b>All cities</b>	<b>4.6%</b>	<b>↑0.3%</b>	<b>2.3%</b>	<b>↑0.3%</b>	<b>3.5%</b>	<b>↑0.3%</b>

Statistics for Brighton, Cambridge and Reading are presented this year for the first time in the series. Changes in passenger numbers for all cities therefore do not include these cities.

## 9. Major city comparisons

Over the last seven years, numbers of standing passengers have risen in many large cities. This section looks at how levels of standing passengers compares across major cities and over time.

### Top 5: AM peak passengers standing: 2017

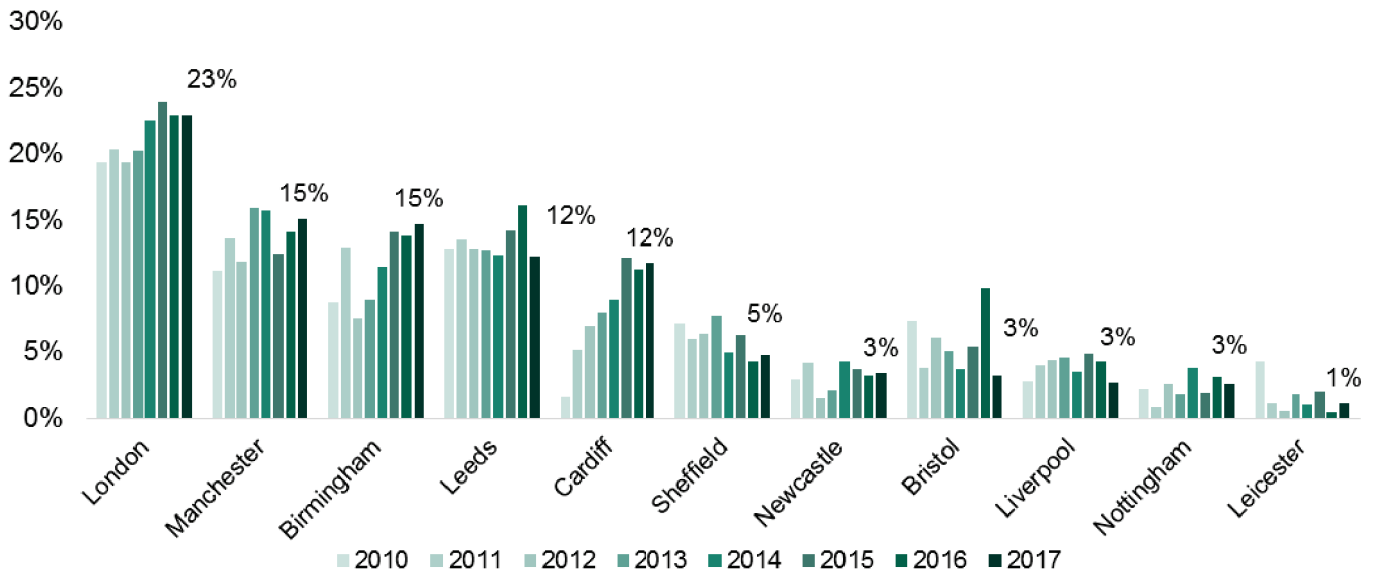
City	Standing passengers (%)	Change from 2010 (pp)
London	23%	↑3.6
Cambridge	16%	-
Manchester	15%	↑4.0
Birmingham	15%	↑6.0
Leeds	12%	↓0.5

### Top 5: AM peak services with standing: 2017

City	Standing services (%)	Change from 2010 (pp)
London	64%	↑6.6
Leeds	50%	↑0.9
Birmingham	45%	↑16.0
Manchester	41%	↑11.2
Cardiff	31%	↑24.0

In six cities the percentage of standing passengers in the AM peak has increased over the last year. It fell in Bristol, Leeds, Liverpool and Nottingham, and was unchanged in London. Over the last seven years, Cardiff has seen the largest increase in passengers standing from 2% in 2010 to 12% in 2017, while Bristol fell by the largest margin from 7% in 2010 to 3% in 2017.

**Chart 5: AM peak passengers standing into major cities**



### Network Capacity

Extensive remodelling of city centre stations, electrification of routes around Manchester and Birmingham allowing better use of rolling stock, and reallocating trains around the country help to minimise crowding. In the future, many franchises such as Northern, TransPennine, Wales, Anglia and West Midlands will provide longer and more frequent trains. In the longer term, HS2 could also free up capacity on the existing network for additional services, and new signalling systems will allow more trains to run on existing routes.



# 10. London station comparisons

We have seen that levels of standing passengers in London have increased over many years. This section looks at comparisons between the major stations in central London.

### Top 5: AM peak passengers standing: 2017

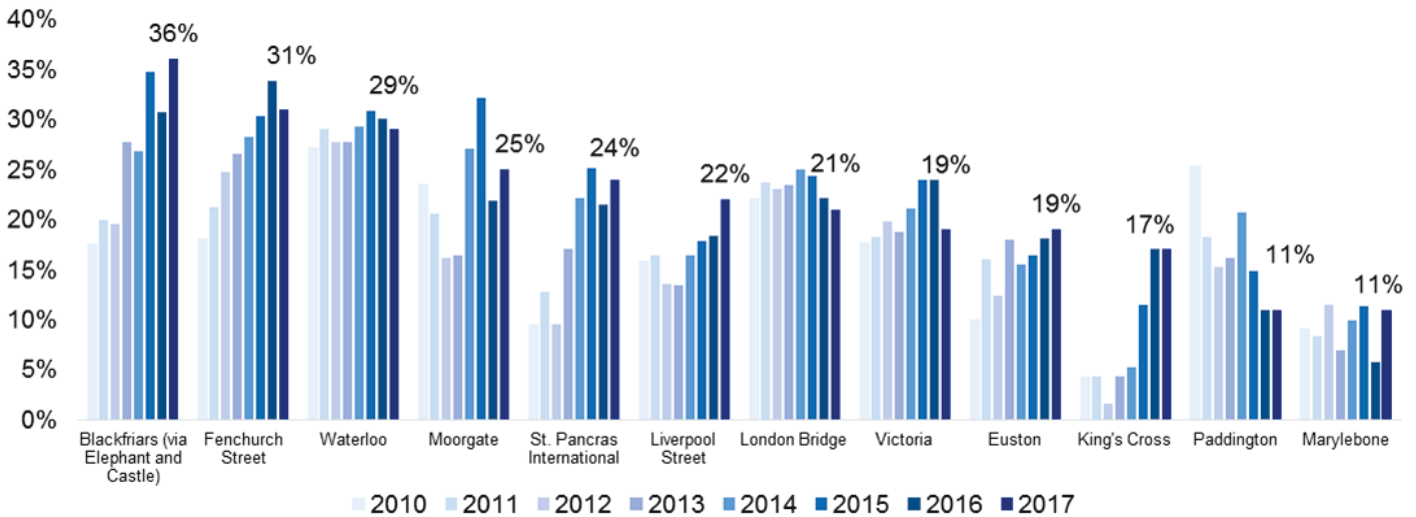
Station	Standing passengers (%)	Change from 2010 (pp)
<b>Blackfriars</b>	36%	↑18.5
<b>Fenchurch St.</b>	31%	↑12.7
<b>Waterloo</b>	29%	↑1.7
<b>Moorgate</b>	25%	↑1.6
<b>St Pancras</b>	24%	↑14.9

### Top 5: AM peak services with standing: 2017

Station	Standing services (%)	Change from 2010 (pp)
<b>Fenchurch St.</b>	89%	↑8.0
<b>Waterloo</b>	82%	↑2.6
<b>Blackfriars</b>	81%	↑19.6
<b>Moorgate</b>	71%	↓11.2
<b>St Pancras</b>	70%	↑35.7

Blackfriars has seen the largest increase in the percentage of passengers standing between 2010 and 2017, whereas St Pancras has seen the largest increase in services with standing passengers. Although passenger numbers at Blackfriars fell over the last year, largely due to the re-routing of services to London Bridge, the number of standing passengers has increased. This is due to new rolling stock used for Blackfriars services, which have fewer seats and greater standing capacity.

**Chart 6: AM peak passengers standing into central London stations**



### Capacity upgrades in London

When fully operational, the Thameslink Programme, along with Crossrail (the Elizabeth Line) will create significantly increased capacity into London. More services and longer trains will operate on existing routes into Liverpool St, Kings Cross, St Pancras, Paddington, Blackfriars and London Bridge, giving morning peak passengers new journey options and an increase in capacity.

**THAMESLINK PROGRAMME**

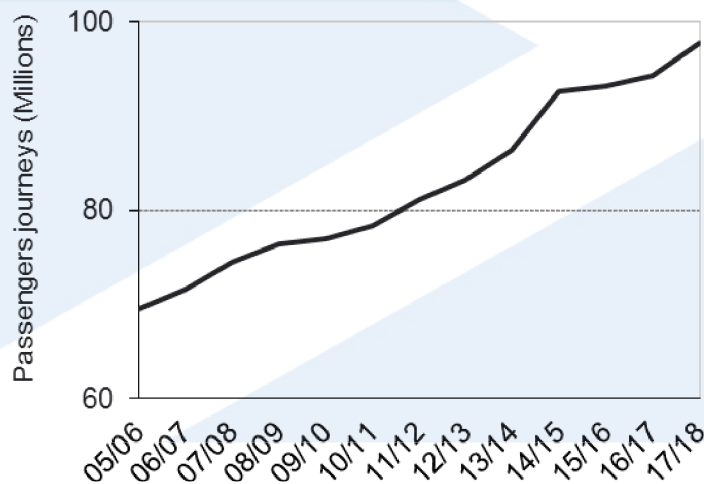




# 11. Rail travel in Scotland

This page looks at rail travel in Scotland. Regional services operated by ScotRail are franchised by Transport Scotland. As with the rest of Great Britain, the number of journeys made by rail in Scotland has increased considerably; ScotRail has seen a 31% increase over the last 10 years, and in 2017-18 about 97.8 million journeys were made. Rail traffic in Scotland is concentrated around Glasgow and Edinburgh, and all of the country's ten busiest trains are services to or from these cities.

**Chart 7: ScotRail passenger journeys<sup>1</sup>**



**Table 7: Scotland's busiest stations, 2016-17<sup>1</sup>**

	Station	Passenger journeys (thousands)
1	Glasgow Central	32,060
2	Edinburgh Waverley	22,582
3	Glasgow Queen Street	14,682
4	Paisley Gilmour Street	4,115
5	Aberdeen	3,058
6	Partick (Glasgow)	3,026
7	Haymarket (Edinburgh)	2,780
8	Stirling	2,338
9	Charing Cross (Glasgow)	2,154
10	Exhibition Ctr (Glasgow)	1,892

The ScotRail franchise is currently introducing new trains, which along with recent expansion of the electrified rail network in the Central Belt, will increase the number of seats on services. Glasgow Queen Street station is currently being redeveloped to increase its capacity.

## Scotland's busiest trains

As per Scotrail's franchise terms, crowding is measured after 10 minutes of boarding a train, where passengers should have a reasonable expectation of getting a seat.

**Table 8: Scotland's 10 busiest trains, 2016/17<sup>6</sup>**

Rank	Service	Busiest section
1	1634 Edinburgh - Perth	Haymarket – Inverkeithing
2	0807 Neilston – Glasgow Central	Muirend - Glasgow Central
3	0755 North Berwick - Haymarket	Musselburgh – Edinburgh
4	1815 Edinburgh – Glenrothes via Dunfermline	Haymarket – Inverkeithing
5	1624 Edinburgh – Tweedbank	Edinburgh – Newcraighall
6	1635 Glasgow Central – Neilston	Glasgow Central – Crosshill
7	1817 Glasgow Central – Edinburgh	Glasgow Central – Uddingston
8	0756 Barrhead – Glasgow Central	Pollokshaws West - Glasgow Central
9	1727 Glasgow Central – Barrhead	Glasgow Central - Pollokshaws West
10	0928 Dunblane - Edinburgh	Linlithgow – Haymarket

<sup>1</sup>Office of Rail and Road; <sup>6</sup><https://www.transport.gov.scot/media/42251/scotrains-top-10-busiest-trains-may-2018.pdf>

## 12. Passenger demand and capacity

Since 2010, passenger demand has grown faster than capacity in every city except for Bristol, Liverpool and Newcastle (where demand has fallen). When looking across the AM peak, the number of seats entering a city is normally higher than the number of passengers, but as some routes are busier than others and some passengers choose to travel on particular services (i.e. fast services) at particular times these services suffer most from overcrowding.

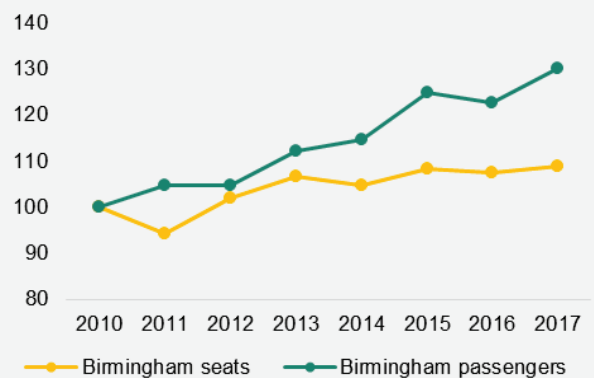
### Birmingham

Between 2010 and 2017:

- AM peak seats have increased by **4,100**
- AM peak demand has increased by **10,600**

In future electrification of the lines to Rugeley and Bromsgrove will allow more frequent trains to operate, redevelopment of a number of stations is proposed, and as part of the new West Midlands franchise new trains will provide a step-change in capacity from 2020.

Index: AM peak passengers and seats



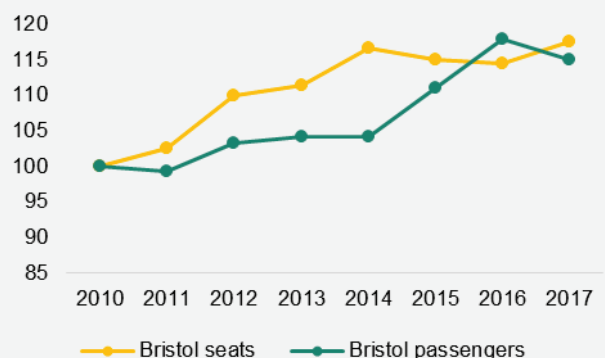
### Bristol

Between 2010 and 2017:

- AM peak seats have increased by **2,000**
- AM peak demand has increased by **1,200**

The capacity of the rail network around Bristol is being increased by doubling the number of tracks on the line to Filton. This, along with the introduction of the new IEP trains will allow a more frequent service towards London, and longer trains are being provided on suburban routes.

Index: AM peak passengers and seats



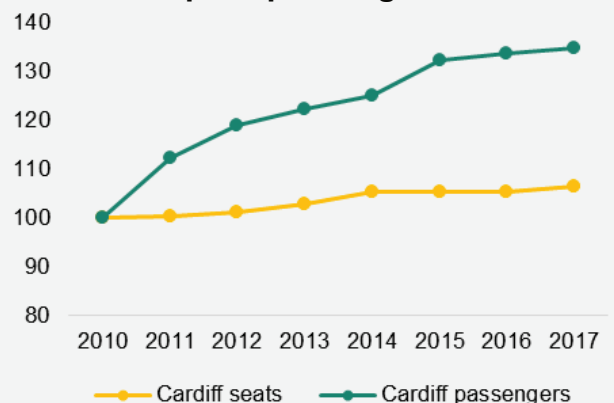
### Cardiff

Between 2010 and 2017:

- AM peak seats have increased by **1,200**
- AM peak demand has increased by **3,600**

Increase in demand on peak services over recent years may be driven by changes in the local economy and constraints on the road network into the Valleys. The new Wales and Borders franchise starting this year will transform train services through the introduction of a metro-style operation.

Index: AM peak passengers and seats



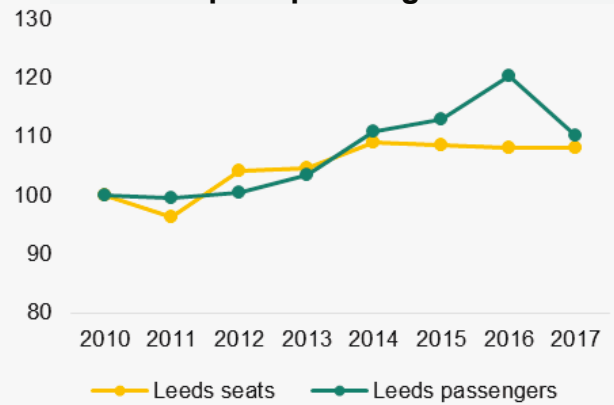
### Leeds

Between 2010 and 2017:

- AM peak seats have increased by **2,100**
- AM peak demand has increased by **2,300**

New trains being built for the Northern and TransPennine franchises will dramatically increase capacity on many routes into the city by providing longer and more frequent services in 2019.

Index: AM peak passengers and seats



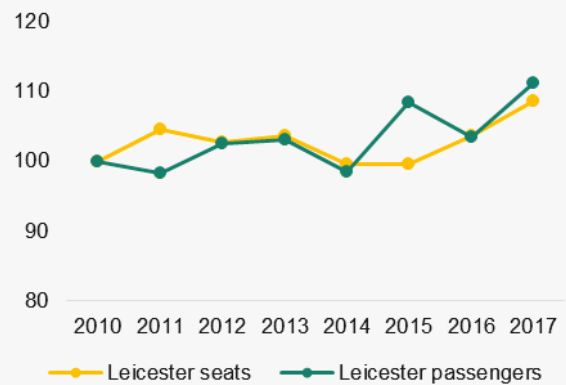
### Leicester

Between 2010 and 2017:

- AM peak seats have increased by **800**
- AM peak demand has increased by **600**

The East Midlands franchise will shortly be re-let and providing sufficient capacity is one of the key priorities.

Index: AM peak passengers and seats



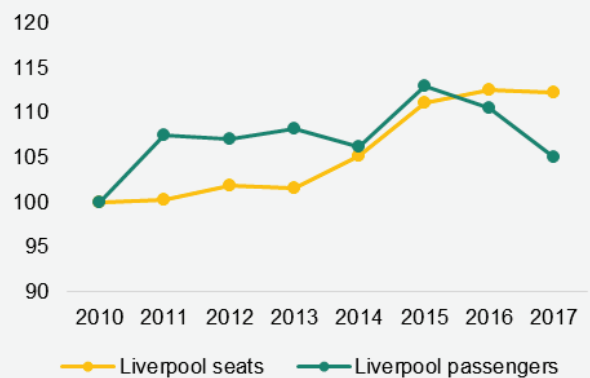
### Liverpool

Between 2010 and 2017:

- AM peak seats have increased by **3,500**
- AM peak demand has increased by **1,000**

Liverpool Lime St station is currently being remodelled to improve capacity. New trains for Northern and TransPennine are also being introduced in 2019 and a complete new fleet will be introduced on the Merseyrail network in 2020.

Index: AM peak passengers and seats



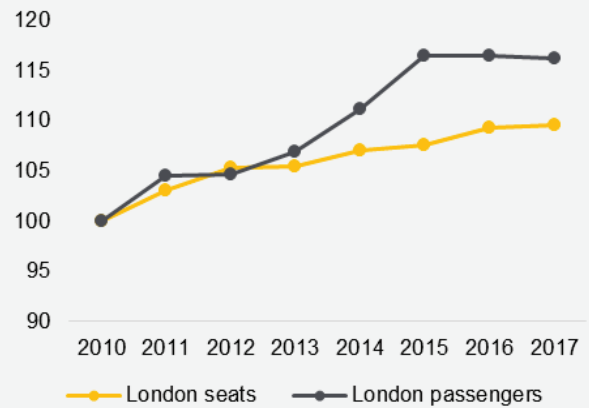
## London

Between 2010 and 2017:

- AM peak seats have increased by **48,300**
- AM peak demand has increased by **90,300**

The Thameslink Programme, along with Crossrail (The Elizabeth Line) is creating significant increases in capacity into and through central London.

Index: AM peak passengers and seats



Changes in seating capacity and passenger demand at central London stations:

	Between 2010 and 2017:	
	Increase in seats (%)	Increase in passengers (%)
<b>Blackfriars (via Elephant and Castle)</b>	5.6	47.3
<b>Euston</b>	21.6	39.5
<b>Marylebone</b>	30.5	37.9
<b>St. Pancras International</b>	-4.2	35.5
<b>Fenchurch Street</b>	11.3	33.8
<b>King's Cross</b>	9	25.4
<b>Liverpool Street</b>	11	21.2
<b>Victoria</b>	7.1	14.1
<b>Moorgate</b>	13.2	13.1
<b>Waterloo</b>	6.9	9.2
<b>Paddington</b>	34.7	9.1
<b>London Bridge</b>	6.2	1.7

## Manchester

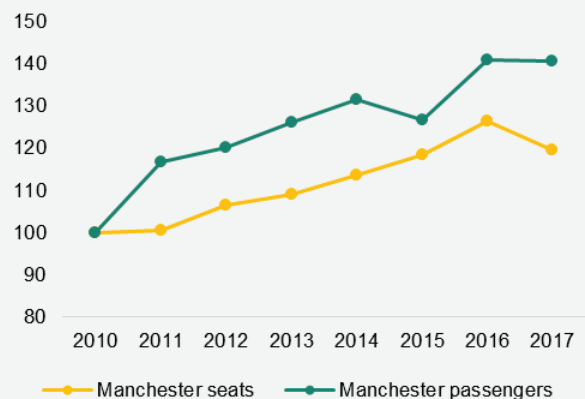
Between 2010 and 2017:

- AM peak seats have increased by **6,700**
- AM peak demand has increased by **10,400**

Despite Manchester's large tram network which gives travellers another public transport option, there has been strong growth in rail usage.

The new Northern and TransPennine franchises will provide new trains to provide longer and more frequent services into the city in 2019.

Index: AM peak passengers and seats



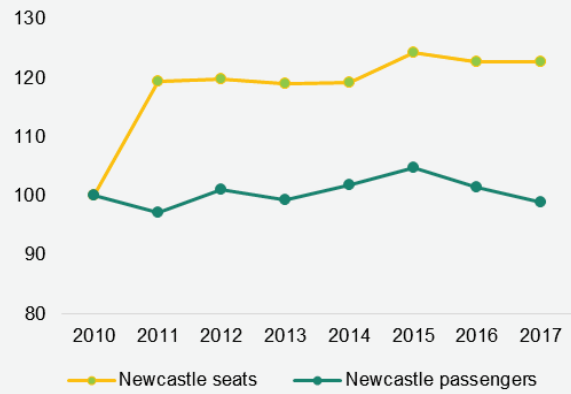
### Newcastle

Between 2010 and 2017:

- AM peak seats have increased by **1,600**
- AM peak demand is unchanged

Newcastle benefits from a Metro system that is widely used by commuters. Both TransPennine and Northern are building new trains which will provide more capacity on the railway from 2019. New IEP trains will also provide benefits for intercity passengers.

Index: AM peak passengers and seats



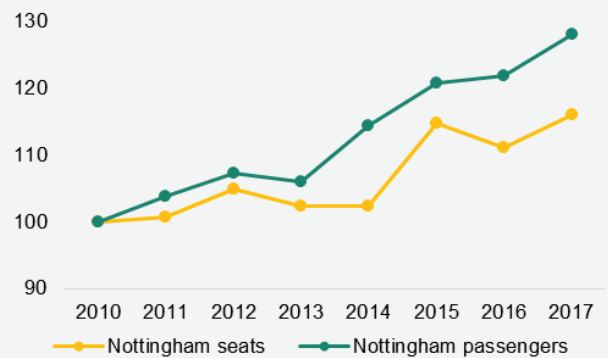
### Nottingham

Between 2010 and 2017:

- AM peak seats have increased by **1,000**
- AM peak demand has increased by **1,000**

The East Midlands franchise will shortly be re-let and providing sufficient capacity is one of the key priorities.

Index: AM peak passengers and seats



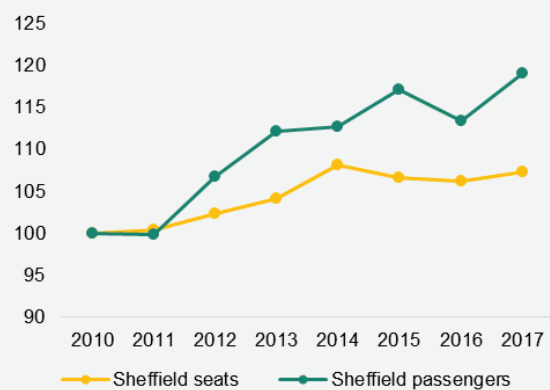
### Sheffield

Between 2010 and 2017:

- AM peak seats have increased by **700**
- AM peak demand has increased by **1,200**

Sheffield is served by the Northern, TransPennine, East Midlands and Cross Country franchises. The first two of these will have new trains introduced to increase the capacity into the city in 2019. The East Midlands and Cross Country franchises will shortly be re-let and providing enough capacity will be critical components.

Index: AM peak passengers and seats

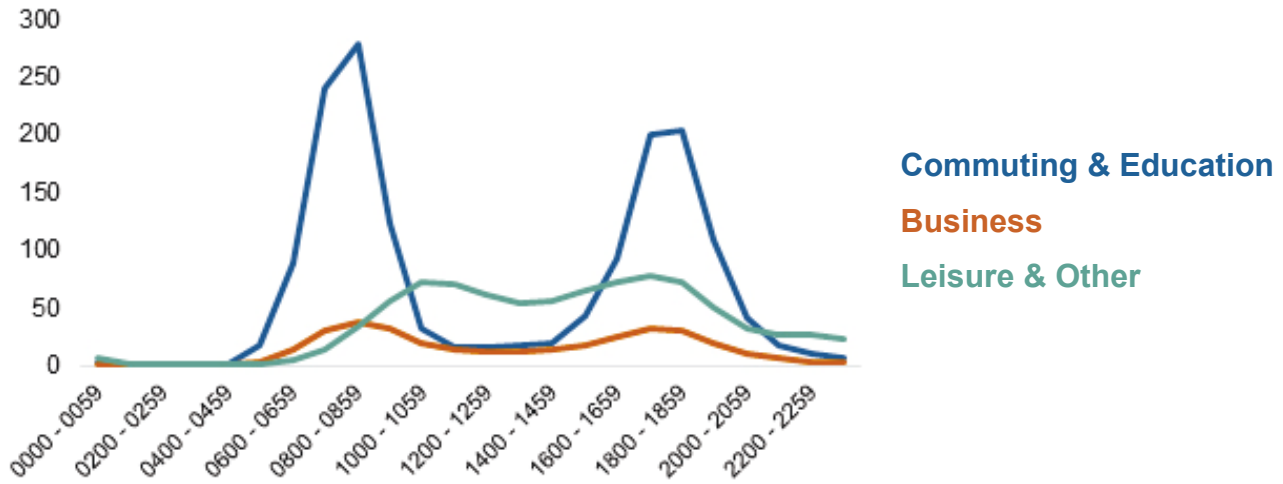




### 13. Rail travel throughout the day

A high concentration of demand for rail services falls within the morning and afternoon peaks, where commuters tend to enter and leave the city centres. During these times, pressure is put on the rail network to provide enough capacity along the commuter routes.

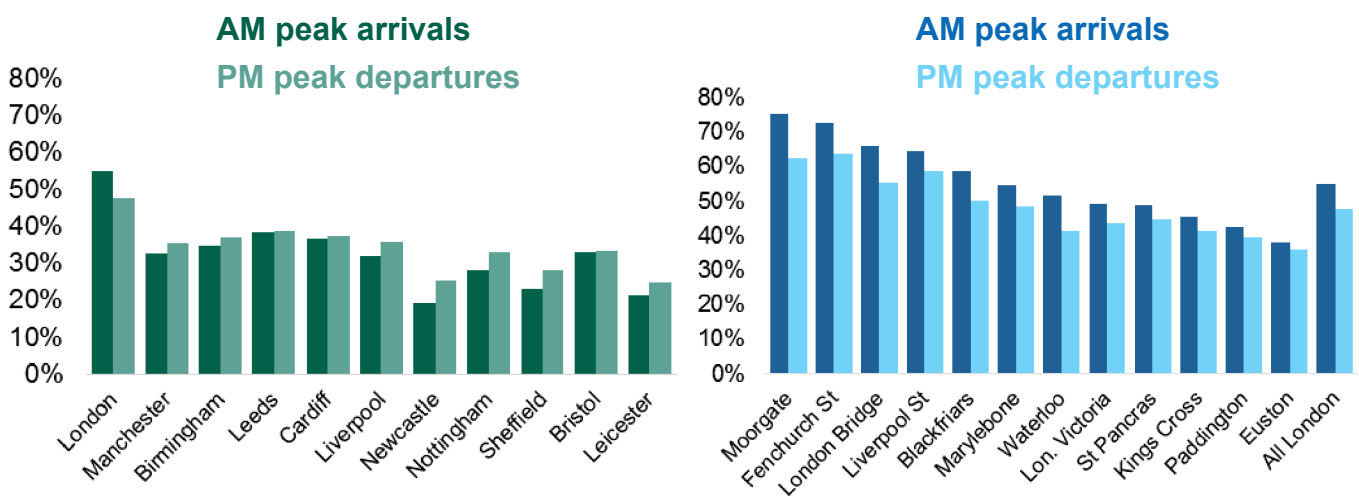
**Chart 8: Rail trips by trip purpose and time of day (index): Weekdays, England, 2007-2016**



While most commuters travel in the morning peak, the return trip in the evening tends to be more spread and often falls outside of the peak. However, when including the business and leisure journeys made in the evening peak, it tends to be busier than the morning peak across all cities, except for in London where commuting dominates rail travel.

Services to Moorgate mainly serve commuters whereas business or leisure passengers may choose to use Kings Cross or Euston where there are better connections and services tend to carry business and leisure passengers outside of the main peaks.

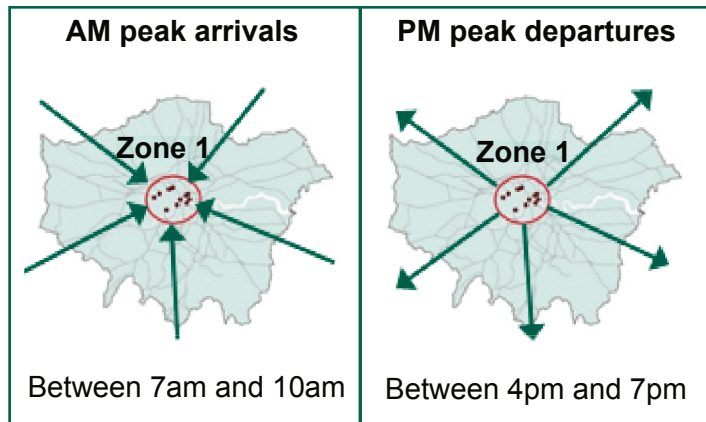
**Chart 9: Proportion of passengers travelling in the peaks, by city and London station**



# 14. Passenger numbers and crowding in London

## Rail passenger numbers travelling into London have fallen

Passenger numbers arriving into London are counted on arrival at the first station stop in Zone 1 of the TfL Travelcard area en 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.

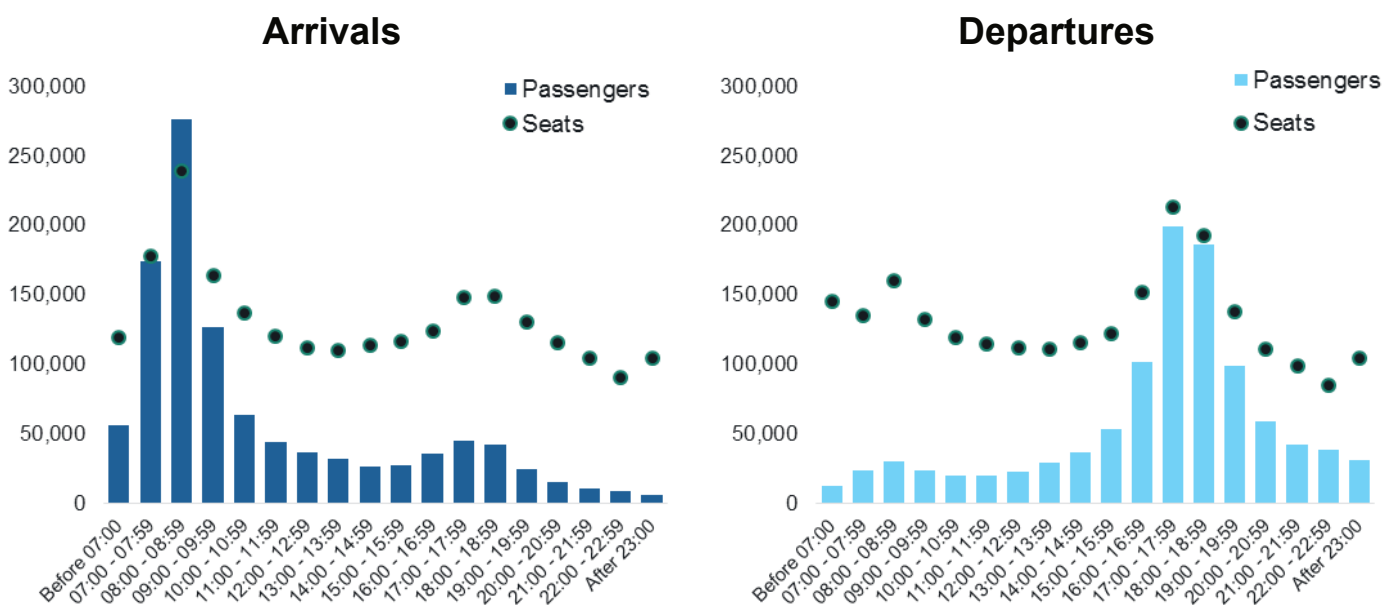


**Table 9: Passenger numbers and PiXC at major London stations during the AM peak**

	2010	2011	2012	2013	2014	2015	2016	2017
<b>AM peak passengers</b>	<b>521,200</b>	<b>533,200</b>	<b>536,200</b>	<b>545,300</b>	<b>563,400</b>	<b>581,400</b>	<b>583,400</b>	<b>577,200</b>
<b>AM peak PiXC</b>	<b>3.9%</b>	<b>4.1%</b>	<b>4.1%</b>	<b>4.1%</b>	<b>5.4%</b>	<b>5.8%</b>	<b>5.7%</b>	<b>5.4%</b>

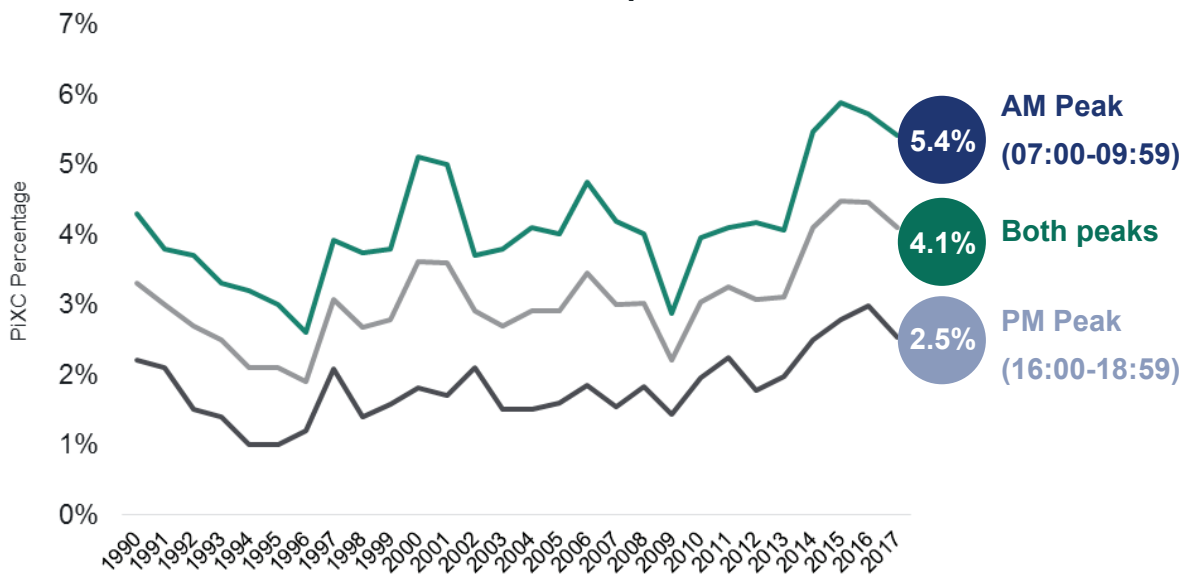
Just over one million passengers arrived into central London by rail over the course of a typical day in autumn 2017. Passenger demand is concentrated in the morning peak, when 55% of all passengers arrived. The number of passengers arriving during the morning peak has increased by around 56,000 since 2010. This is broadly equivalent to the total number of daily arrivals at King’s Cross station.

**Chart 10: London arrivals and departures by time band, 2017**



Since 1990, peak crowding levels to and from London have increased, but over the last year there has been a dip. Morning peak PiXC for London and South East operators is at its lowest level since 2013, and afternoon peak PiXC is at its lowest level since 2014.

**Chart 11: PiXC for London & South East operators, 1990 to 2017**



Note: This series does not include Long Distance operators' services.

If you are viewing this digitally, you can view the statistics summaries for each city and central London stations using our interactive dashboard at the following link:

<http://maps.dft.gov.uk/rail-passengers-and-crowding/interactive-dashboard/index.html>

**Rail passenger numbers and crowding on weekdays in England and Wales: 2017**

**City summary**

**Operators and routes**

Operator	Services	Routes
Cross Country	106	Long-distance services between South West England and North England & Scotland
Great Western	411	Long-distance services to/from London; regional services to South West England, the south coast and Wales, and local services.
South Western	8	Occasional services to/from London Waterloo

**About this city**

Only the city's main central station, Bristol Temple Meads, is included in these statistics. Passenger numbers have increased slightly compared to Autumn 2016. Additional carriages have been provided on some local services and this should reduce crowding, but could also encourage more commuters to switch to rail.

**Passenger numbers and seats**

Arrival Passengers, Departure Passengers, Arrival Seats, Departure Seats

**Peak crowding**

- AM Peak: 0.8% PiXC crowding
- PM Peak: 3.2% Passengers Standing
- Services with PiXC: 6%
- Services with Standing: 18%

**Crowding by operator**

- AM PiXC
- AM Standing
- PM PiXC
- PM Standing

South Western, Cross Country, Great Western

## 15. Background 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, there are a number of factors which 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 on particular services 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>.

## 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
<a href="#">RAI0201</a>	City centre peak and all day arrivals by rail on a typical autumn weekday, by city: annual from 2010
<a href="#">RAI0202</a>	City centre arrivals and departures by rail on a typical autumn weekday, by city and time band: annual from 2011
<a href="#">RAI0203</a>	Central London arrivals and departures by rail on a typical autumn weekday, by station and time band: annual from 2011

### Crowding statistics tables

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



## Definitions

The following definitions are used in this publication and accompanying tables.

<b>Afternoon (PM) peak</b>	All services that depart from a city centre in the 3-hour period from 16:00 to 18:59. The 1-hour PM peak includes all departures between 17:00 and 17:59.
<b>Automatic passenger count (APC)</b>	A passenger count collected by electronic equipment fitted to a train, for example 'infra-red' or 'load weighing' systems.
<b>Autumn period</b>	The period from mid-September to mid-December, excluding school holidays and bank holidays.
<b>City centre</b>	One or more selected railway stations in the centre of the city. In London this includes all stations within Zone 1 of the Transport for London (TfL) Travelcard area.
<b>Cordon point</b>	For 'arrivals' this is the first station that a service calls at or passes on route into city centre terminals. For 'departures' it is the last station that a service calls at or passes on its way out of a city centre.
<b>Critical load point</b>	The station where the standard class passenger load on a service is highest on arrival at (AM peak) or on departure from (PM peak) a city centre. Critical load points can vary each time a service runs but will usually be at the same location for services on the same route.
<b>Franchised train operator</b>	A train operator that is franchised by DfT or another government body. Non-franchised train operators' services are not included in these statistics.
<b>Manual passenger count</b>	A passenger count carried out without the use of electronic counting equipment, either on board a train (often by the train guard) or on a platform.
<b>Morning (AM) peak</b>	All services arriving at a city centre in the 3-hour period from 07:00 to 09:59. The 1-hour AM peak includes all arrivals between 08:00 and 08:59.
<b>Number of passengers</b>	Includes all standard and first class passengers on services when they arrive at or depart from the city centre .
<b>Number of services</b>	The number of services that the statistics are based on. This includes all train operators' services timetabled to run during the autumn period.
<b>Passenger count</b>	A count carried out by a train operator of the number of passengers on board a train at a particular point along its route.
<b>Passengers in excess of capacity (PiXC)</b>	The number of standard class passengers on a service that are in excess of the standard class capacity at the critical load point.
<b>Passengers standing</b>	The number of standard class passengers on a service that are in excess of the number of standard class seats at the critical load point.
<b>Total seats</b>	Includes all standard and first class seats on services when they arrive at or depart from the city centre.
<b>Service</b>	A train service refers to a specific train that operates routinely during the autumn timetable period, for example, the 10:00 King's Cross to Aberdeen 17:06 service.
<b>Standard class capacity</b>	Includes the number of standard class seats on the service and may include a standing allowance.

## 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 a 2013 consultation is published on the DfT rail statistics notes and guidance webpage: <https://www.gov.uk/transport-statistics-notes-and-guidance-rail-statistics>.

A new user survey will accompany the 2017 release and can be found here: <https://www.smartsurvey.co.uk/s/preview/0CNHJ/8F38865F420D43EB826FD51A488FA6>. 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.gsi.gov.uk](mailto:rail.stats@dft.gsi.gov.uk).

## Background notes

1. Further information about the statistics in this report can be found in the [notes and definitions](#).
2. To retain data confidentiality, two Chiltern Railways services at London Paddington were excluded from the passenger number statistics. See the [notes and definitions](#) for details of the confidentiality of passenger count data.
3. The United Kingdom Statistics Authority has designated these statistics as National Statistics, 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.

4. 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](#).
5. This is an annual publication. The next annual release of rail passenger numbers and crowding statistics will be the 2018 statistics published in summer 2019.