Department for Transport

Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2015

The number of passengers using National Rail has continued to grow between 2014 and 2015, and these latest statistics show the direct impact this growth has had on levels of train crowding in a number of major cities.

Main results

On a typical autumn weekday in 2015:

- There were 581,400 passengers arriving into London during the morning peak, an increase of 3.2% since 2014. Birmingham, the city with the next largest number of arrivals, had 42,900.

- Crowding levels at major cities rose by 0.4 percentage points in the morning peak to 5.0% PiXC, and 0.2 percentage points in the afternoon peak to 2.4% PiXC between 2014 and 2015.

- Morning peak PiXC was greatest at London, at 5.8% PiXC, followed by Manchester with 3.7% PiXC and Birmingham with 2.4% PiXC.

- London Blackfriars (via Elephant and Castle) had the highest morning peak crowding level of all major London stations, at 14.7% PiXC, and rose by 3.8 percentage points between 2014 and 2015, the largest increase of all major London stations.

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 by franchised train operators in autumn 2015. They represent passenger numbers on National Rail services on a 'typical' weekday.

More information is available in the accompanying notes and definitions document.

In this publication

What is 'PiXC'?

Passengers in excess of capacity (PiXC) is the main measure of crowding used in these statistics. It shows the proportion of standard class passengers that are above the capacity on their service at its busiest point.

The numbers comprising PiXC on each service are added together and shown as a percentage of the total number of standard class passengers on all peak services.

A service's capacity includes all standard class seats, and also includes a standing allowance if passengers are standing for 20 minutes or less.
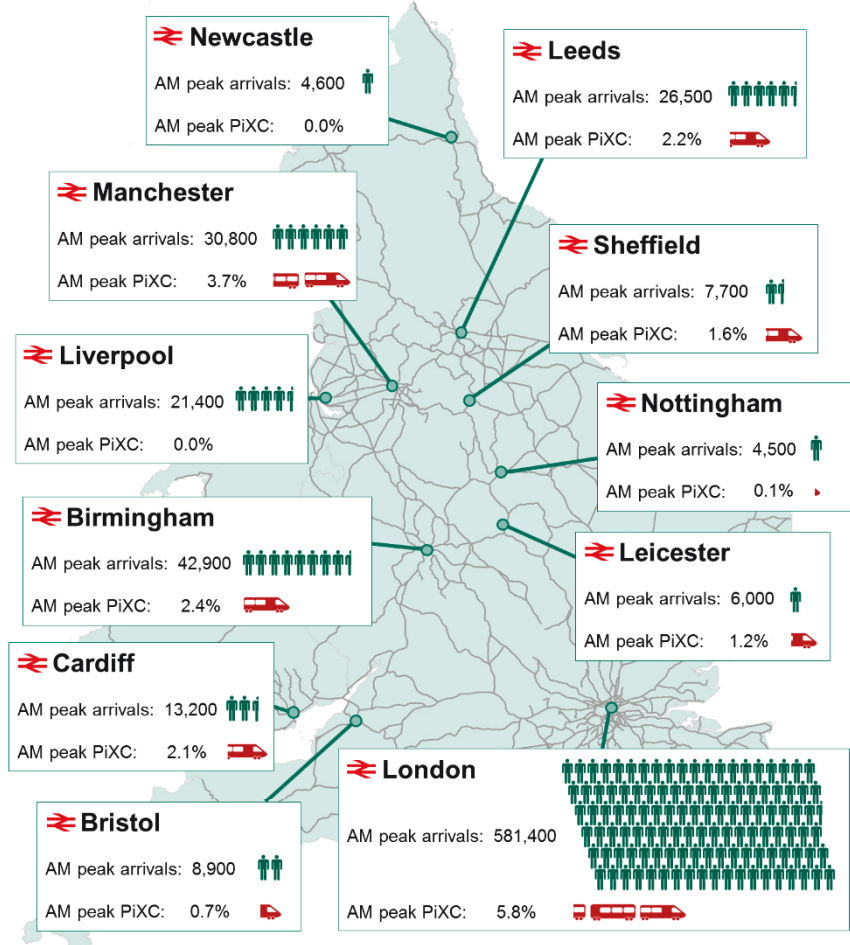
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Rail passenger numbers and crowding during the morning peak on weekdays in major cities in England and Wales
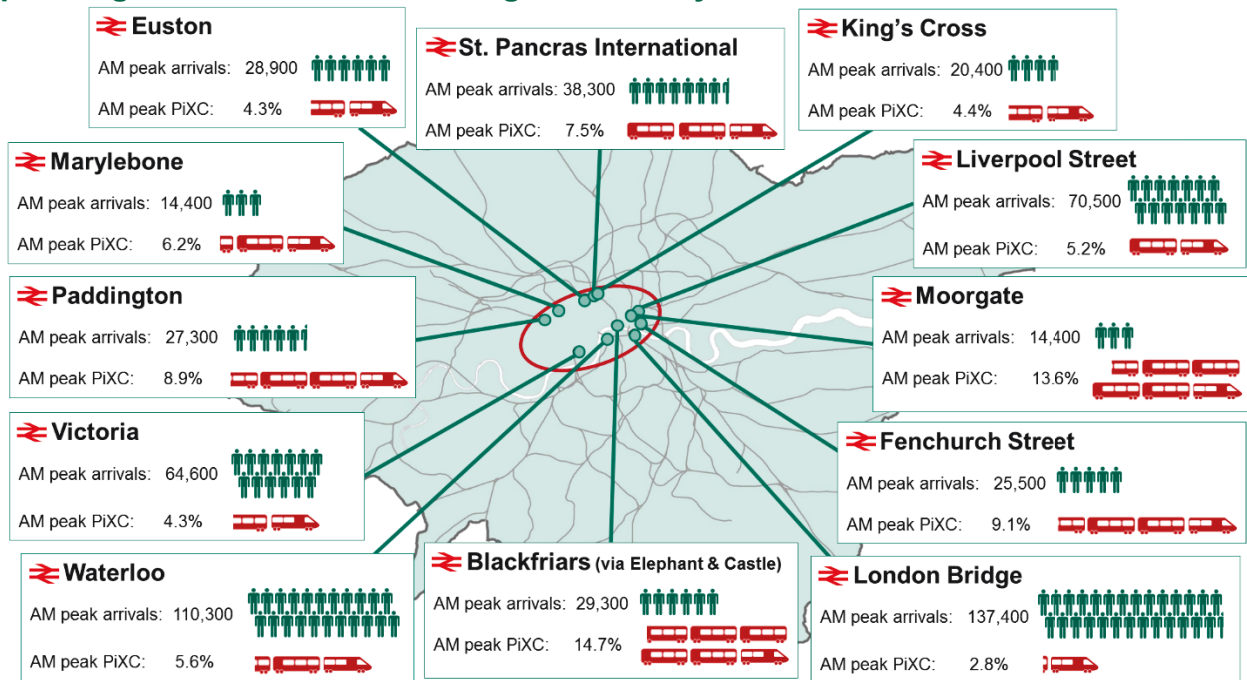
Key

AM peak arrivals is the number of passengers arriving into the city centre by National Rail on a typical autumn weekday during the 3-hour morning peak (7-10am).

AM peak PiXC is the percentage of passengers in excess of capacity (PiXC) across the morning peak on a typical autumn weekday. It is the main measure of crowding in these statistics. A higher PiXC percentage represents a worse crowding level.

- represents central London (zone 1 Travelcard area)

Newcastle
AM peak arrivals: 4,600
AM peak PiXC: 0.0%

Leeds
AM peak arrivals: 26,500
AM peak PiXC: 2.2%

Manchester
AM peak arrivals: 30,800
AM peak PiXC: 3.7%

Sheffield
AM peak arrivals: 7,700
AM peak PiXC: 1.6%

Liverpool
AM peak arrivals: 21,400
AM peak PiXC: 0.0%

Nottingham
AM peak arrivals: 4,500
AM peak PiXC: 0.1%

Birmingham
AM peak arrivals: 42,900
AM peak PiXC: 2.4%

Leicester
AM peak arrivals: 6,000
AM peak PiXC: 1.2%

Cardiff
AM peak arrivals: 13,200
AM peak PiXC: 2.1%

London
AM peak arrivals: 581,400
AM peak PiXC: 5.8%

Bristol
AM peak arrivals: 8,900
AM peak PiXC: 0.7%

Rail passenger numbers and crowding on weekdays in London

Euston
AM peak arrivals: 28,900
AM peak PiXC: 4.3%

St. Pancras International
AM peak arrivals: 38,300
AM peak PiXC: 7.5%

King's Cross
AM peak arrivals: 20,400
AM peak PiXC: 4.4%

Marylebone
AM peak arrivals: 14,400
AM peak PiXC: 6.2%

Liverpool Street
AM peak arrivals: 70,500
AM peak PiXC: 5.2%

Paddington
AM peak arrivals: 27,300
AM peak PiXC: 8.9%

Moorgate
AM peak arrivals: 14,400
AM peak PiXC: 13.6%

Victoria
AM peak arrivals: 64,600
AM peak PiXC: 4.3%

Fenchurch Street
AM peak arrivals: 25,500
AM peak PiXC: 9.1%

Waterloo
AM peak arrivals: 110,300
AM peak PiXC: 5.6%

Blackfriars (via Elephant & Castle)
AM peak arrivals: 29,300
AM peak PiXC: 14.7%

London Bridge
AM peak arrivals: 137,400
AM peak PiXC: 2.8%

**Statistics published by the Office of Rail and Road (ORR) show that over the last two decades the railways have seen substantial growth in the number of journeys people are making, and passenger journeys are now at their highest level since the 1920s.**

In 2015-16, passenger journeys made with franchised train operating companies (TOCs) grew by 2.0% since 2014-15 to 1.69 billion. This follows twenty years of almost continuous growth, with passengers now making more than double the number of journeys by rail compared with 1994-95.

Figure 1: Passenger journeys for franchised operators; 1985-86 to 2015-16

2.0%
increase in journeys since 2014-15
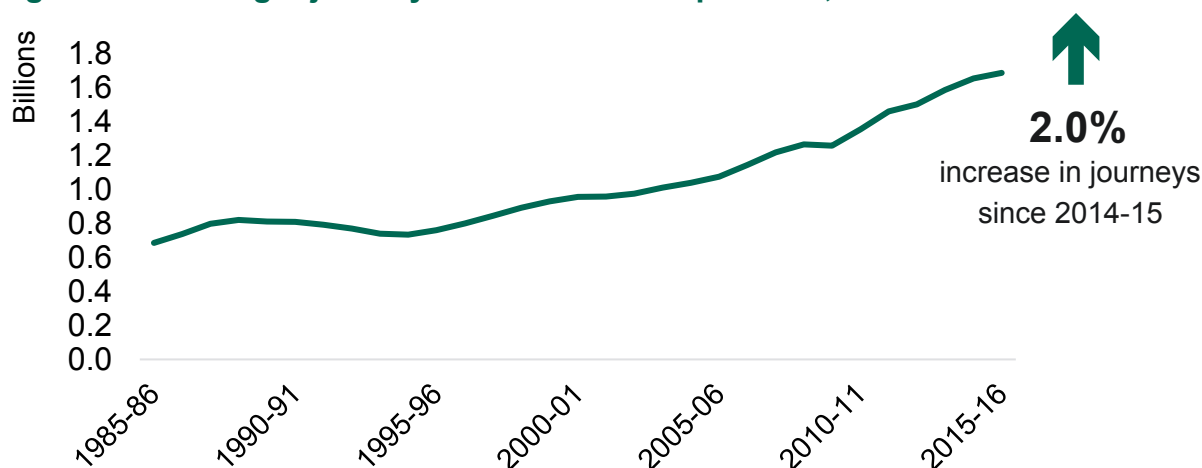
The rise in passenger journeys has been seen across all regions of England and Wales, however, the growth in London has been particularly notable with the highest growth in rail journeys over the last year (5.2%).

All three rail sectors have experienced growth in passenger journeys over the last year. The London & South East sector accounted for around 70% of all journeys, and also recorded the highest growth in passenger journeys of the three sectors.

Table 1: Passenger journeys by rail sector; 2015-16

Sector	Passenger journeys (millions) in 2015-16	Growth since 2014-15
Franchised Long Distance operators	136.0	⬆ 1.4%
Franchised Regional operators	368.0	⬆ 0.9%
Franchised London and South East operators	1,182.9	⬆ 2.4%

Franchised operators across all sectors experienced an increase in passenger journeys between 2014-15 and 2015-16. In 2015-16, with the creation of a new franchise, the greatest number of passenger journeys was on Govia Thameslink Railway (GTR comprised of Gatwick Express, Great Northern, Southern and Thameslink; 327 million), followed by Stagecoach South West Trains (SSWT; 238 million).

Source: Office of Rail and Road (ORR)

Passenger numbers: 2015 summary

Turning to the passenger counts statistics, this section includes information about the total number of passengers travelling to and from selected cities in England and Wales on a typical autumn weekday, and focuses on the morning and afternoon peaks.

London rail travel far exceeds that of other major cities across England and Wales. In 2015, London saw just over a million passengers arriving into the city centre on a typical day. This compares to Birmingham with 125 thousand, the next largest number of passengers.

During the morning peak, when most people commute, there were 581,400 arrivals into central London, an increase of 3.2% since 2014. This 3-hour morning peak period accounts for 55% of all rail passenger arrivals across the whole day in London.

Passenger numbers

The number of passengers are counted on arrival at or departure from the city centre. All major termini are counted at the eleven cities across England and Wales included in these statistics. The London city centre includes stations within the zone 1 Transport for London (TfL) Travelcard area.

Figure 2: Numbers of passengers arriving in the morning peak; 2015

London 581,400

**Birmingham** 42,900

Manchester 30,800

Patterns of rail passenger demand vary across the day and across the major cities. Outside of London all major cities had more passengers departing in the PM peak than arriving in the AM peak, which is likely to be due non-commuter travel adding to the commuter flows.

Chart 1: Passenger numbers in the AM and PM peaks for major cities excluding London

Thousands

AM peak / PM peak
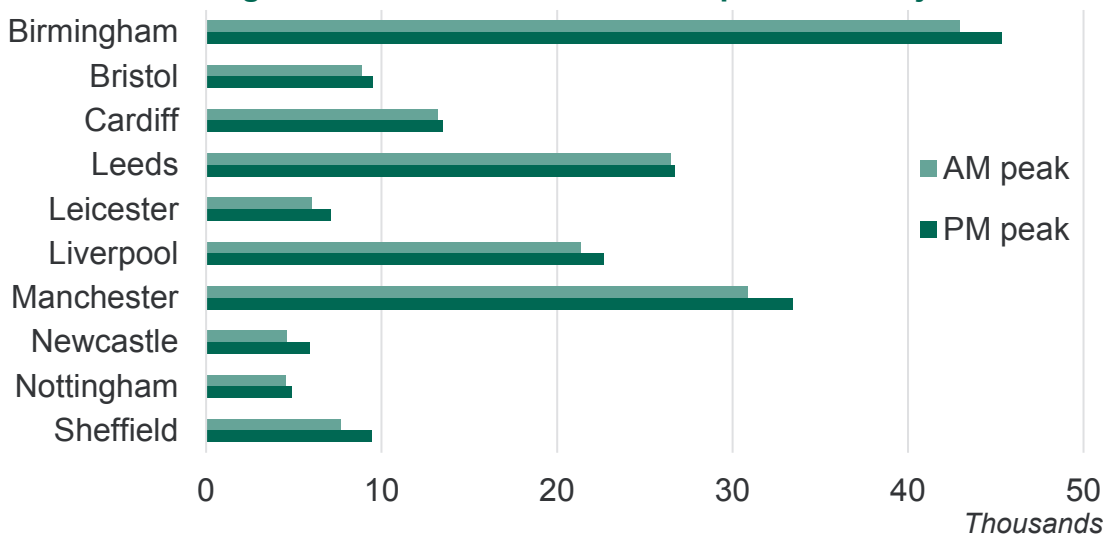
Passenger demand also varies across city centre stations. For major London stations there is a large variation between the quietest and busiest stations, which means that some have a higher concentration of passengers and train services carrying passengers into the city centre during the peak times than others.

Chart 2: Number of passengers arriving in the morning peak and departing in the afternoon peak for major London stations; 2015
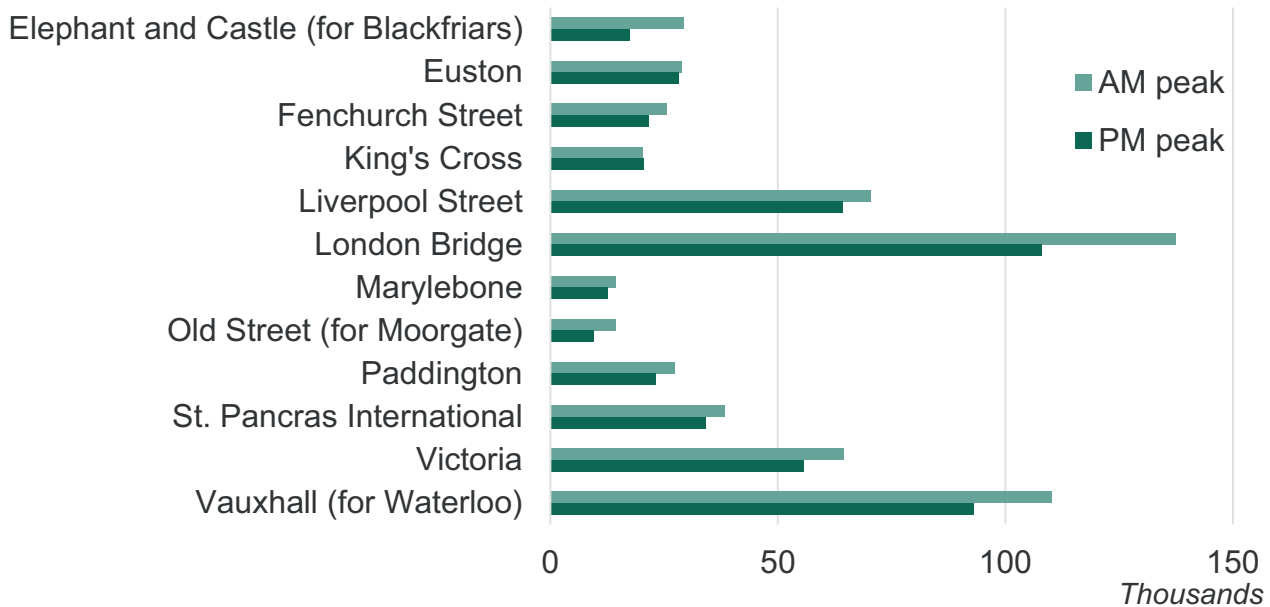
- London Bridge had the largest number of passengers arriving in the morning peak and departing in the afternoon peak of all major London stations. These accounted for 24% of all morning peak arrivals and 22% of all afternoon peak departures in London. Vauxhall (for Waterloo) saw the largest number of passengers arriving and departing throughout the whole day with 429 thousand passengers.

- All major London stations had more passengers arriving in the morning peak than departing in the afternoon peak except for King's Cross where arrival and departure numbers were evenly matched.

Passenger crowding: 2015 summary

The summary table below shows the latest levels of passenger crowding.

Crowding occurs when the number of passengers on a train is greater than the capacity of the train. These aggregate statistics do not reflect variance in crowding across services, but give an indication of the severity of crowding on trains. The PiXC measure is a relative measure of train crowding, which means that a city or station with relatively few passengers and train services can be as crowded as one with many more passengers and services.

Passenger crowding

Crowding levels, measured using the PiXC statistic, 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. They differ from the passenger numbers in that they do not include first class passengers.

Table 2: Passengers in excess of capacity (PiXC) by city: 2015, and percentage point change from 2014 (Rail web table RAI0209)

City	AM peak		PM peak		Both peaks	
	PiXC	Change from 2014	PiXC	Change from 2014	PiXC	Change from 2014
Birmingham	2.4%	⬆0.8%	1.4%	⬆0.6%	1.9%	⬆0.7%
Bristol	0.7%	⬆0.7%	2.2%	⬆2.0%	1.4%	⬆1.3%
Cardiff	2.1%	⬆1.6%	1.4%	⬆0.8%	1.7%	⬆1.2%
Leeds	2.2%	⬆0.4%	1.3%	⬇0.1%	1.7%	⬆0.1%
Leicester	1.2%	⬆0.2%	3.6%	⬆0.7%	2.5%	⬆0.5%
Liverpool	0.0%	⮂0.0%	0.1%	⬇0.3%	0.1%	⬇0.1%
Manchester	3.7%	⬇0.6%	2.1%	⬇0.3%	2.9%	⬇0.4%
Newcastle	0.0%	⬇1.0%	0.0%	⮂0.0%	0.0%	⬇0.4%
Nottingham	0.1%	⬇0.1%	0.1%	⬇0.9%	0.1%	⬇0.5%
Sheffield	1.6%	⬆0.5%	0.7%	⬆0.1%	1.1%	⬆0.3%
All cities outside London	**2.0%**	⬆**0.3%**	**1.3%**	⬆**0.2%**	**1.7%**	⬆**0.2%**
Routes into major London stations						
Blackfriars (via Elephant and Castle)	14.7%	⬆3.8%	5.4%	⬆2.0%	11.2%	⬆3.4%
Euston	4.3%	⬆0.7%	3.9%	⬇0.9%	4.1%	⬇0.1%
Fenchurch Street	9.1%	⬆2.1%	3.7%	⬆1.3%	6.6%	⬆1.7%
King's Cross	4.4%	⬆1.7%	2.6%	⬇0.2%	3.6%	⬆0.8%
Liverpool Street	5.2%	⬇0.3%	2.8%	⬆0.7%	4.1%	⬆0.2%
London Bridge	2.8%	⬇0.5%	0.7%	⬆0.2%	1.8%	⬇0.2%
Marylebone	6.2%	⬆1.3%	1.7%	⬇1.2%	4.1%	⬆0.2%
Moorgate	13.6%	⬆2.9%	1.1%	⬇4.4%	8.5%	⬆0.4%
Paddington	8.9%	⬇4.5%	4.0%	⬇2.0%	6.6%	⬇3.4%
St. Pancras	7.5%	⬆0.3%	6.3%	⬇0.3%	6.9%	⮂0.0%
Victoria	4.3%	⬆1.0%	1.2%	⬆0.9%	2.8%	⬆0.9%
Waterloo	5.6%	⬆0.1%	3.9%	⬆0.4%	4.8%	⬆0.2%
London total	**5.8%**	⬆**0.4%**	**2.8%**	⬆**0.2%**	**4.4%**	⬆**0.3%**
All cities (incl. London)	**5.0%**	⬆**0.4%**	**2.4%**	⬆**0.2%**	**3.8%**	⬆**0.3%**

Key points

- London has the highest level of morning peak crowding of all major cities, with 5.8% PiXC. This compares with Manchester, the next highest city, with 3.7% PiXC in the morning peak. Afternoon peak PiXC was highest in Leicester with 3.6%, followed by London with 2.8% PiXC.

- These statistics also include information on the number of people standing on trains. A total of 155 thousand passengers had to stand on trains arriving into London in the morning peak on a typical day, which increased from 139 thousand passengers recorded in autumn 2014.

How passenger numbers affect crowding

All major cities across England and Wales aside from Newcastle saw growth in the number of passengers travelling to and from the city centres over the last year. In London, more than 160 thousand additional passengers were travelling to and from London on a typical autumn weekday than did in 2011, an increase of 8.4%.

Alongside the rise in passenger numbers, crowding levels have worsened in recent years. Between 2011 and 2015, there was an increase of 1.7 percentage points in morning peak PiXC in London.

While rail passenger demand is highest in London, there are more train services providing the capacity needed to carry passengers. The worsening crowding levels show that capacity provision is not coping with rising levels of passenger demand, which has been the case in London and a number of other cities.

> *Differences between the passenger numbers and crowding statistics*
>
> Passenger numbers are taken from passenger counts at city centres, whereas the crowding statistics are derived from passenger counts at the busiest point during a train's journey into a terminus.
>
> Also, crowding statistics include only standard class passengers, whereas passenger numbers include both standard and first class passengers.

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

The majority of travel during times when crowding levels are at their highest is for commuting. Transport Focus' latest National Rail Passenger Survey (NRPS) shows that whilst most people are satisfied with their last rail journey (80%), commuters are less satisfied (72%) than others. Only 52% of commuters were satisfied with having sufficient room for all to sit/stand on the train, which is one of the biggest drivers of passenger dissatisfaction.

Passenger numbers and crowding in London

Passenger numbers on a typical autumn weekday in London

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

AM peak arrivals
Zone 1
Between 7am and 10am

PM peak departures
Zone 1
Between 4pm and 7pm
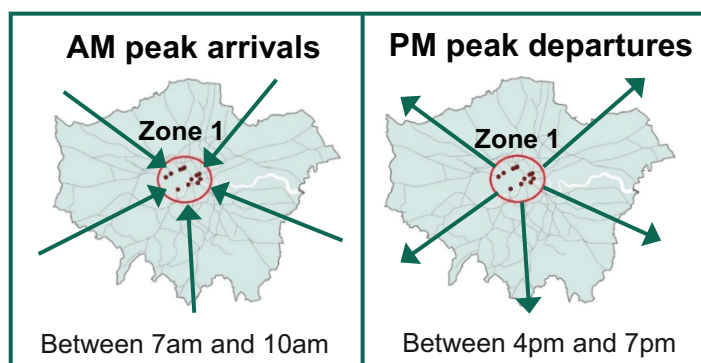
Key points

- During a typical autumn weekday in 2015, a total of 1.05 million passengers arrived into central London, an increase of 1.7% since 2014.

- In the morning peak 581,400 passengers arrived into central London, an increase of 3.2% in the last year. The total number of afternoon peak passengers was 488 thousand, up 2.6% from a year ago.

Table 3: Passenger numbers at major London stations during the morning peak, and morning peak PiXC on routes into major London stations.

Year	2010	2011	2012	2013	2014	2015
Passenger numbers during the morning peak	521,200	533,200	536,200	545,300	563,400	581,400
PiXC for the morning peak	3.9%	4.1%	4.1%	4.1%	5.4%	5.8%

- London Bridge had the largest number of passengers arriving in the morning peak and departing in the afternoon peak of all major London stations. These accounted for 24% of all morning peak arrivals and 22% of all afternoon peak departures in London. Vauxhall (for Waterloo) saw the largest number of arrivals and departures throughout the day with 429 thousand passengers.

- The largest increase of passenger arrivals from 2014 to 2015 was at Blackfriars (via Elephant and Castle), where there were 26% more morning peak arrivals in 2015 compared with a year ago. The largest increase of passenger departures was at King's Cross, where there was an increase of 16% between 2014 and 2015.

Passenger numbers across the day

Passengers arriving during the morning peak accounted for 55% of all daily arrivals into London, the highest concentration of passengers in the morning peak of all major cities. Passengers departing in the afternoon peak accounted for 47% of all daily departures from London.

While there is high passenger demand on some services, others have spare capacity. Charts 3 and 4 show that most of the spare capacity is on trains that run outside of peak times, and this capacity will generally not be transferrable between routes or to other times of the day.

Chart 3: Arrivals by time band for central London, 2015
(Rail web table RAI0203)
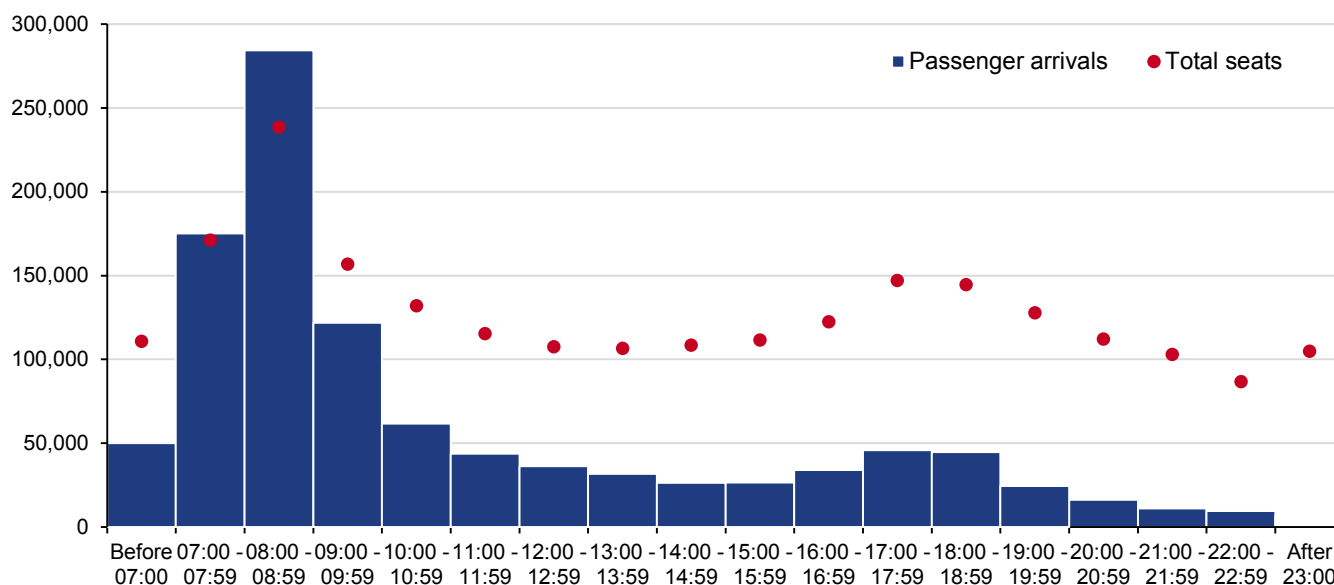
Chart 4: Departures by time band for central London, 2015
(Rail web table RAI0203)
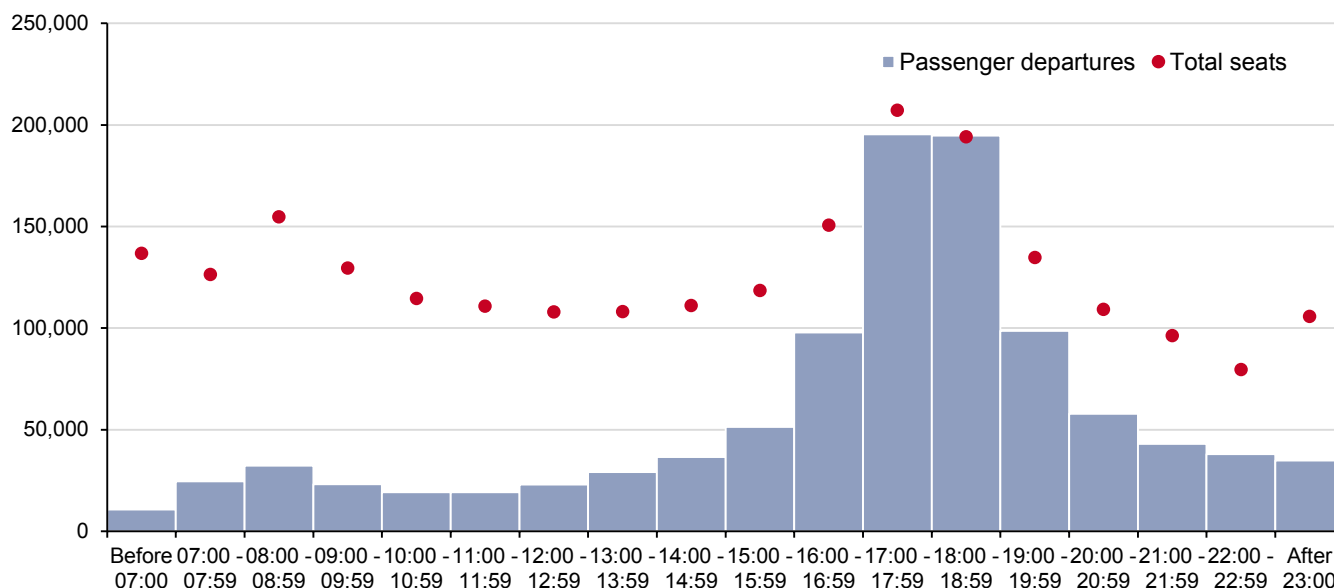
Crowding on a typical autumn weekday in London

- On a typical weekday in autumn 2015, across both peaks, 4.5% of passengers were in excess of capacity (PiXC) on London & South East operators' rail services, an increase from 4.1% in 2014.

- In the morning peak, crowding increased to 5.9% PiXC in 2015 from 5.5% in 2014, and in the afternoon peak it increased to 2.8% PiXC from 2.5% in 2014.

Chart 5: Passengers in excess of capacity (PiXC) for London & South East operators, 1990-2015 (Rail web table RAI0210)
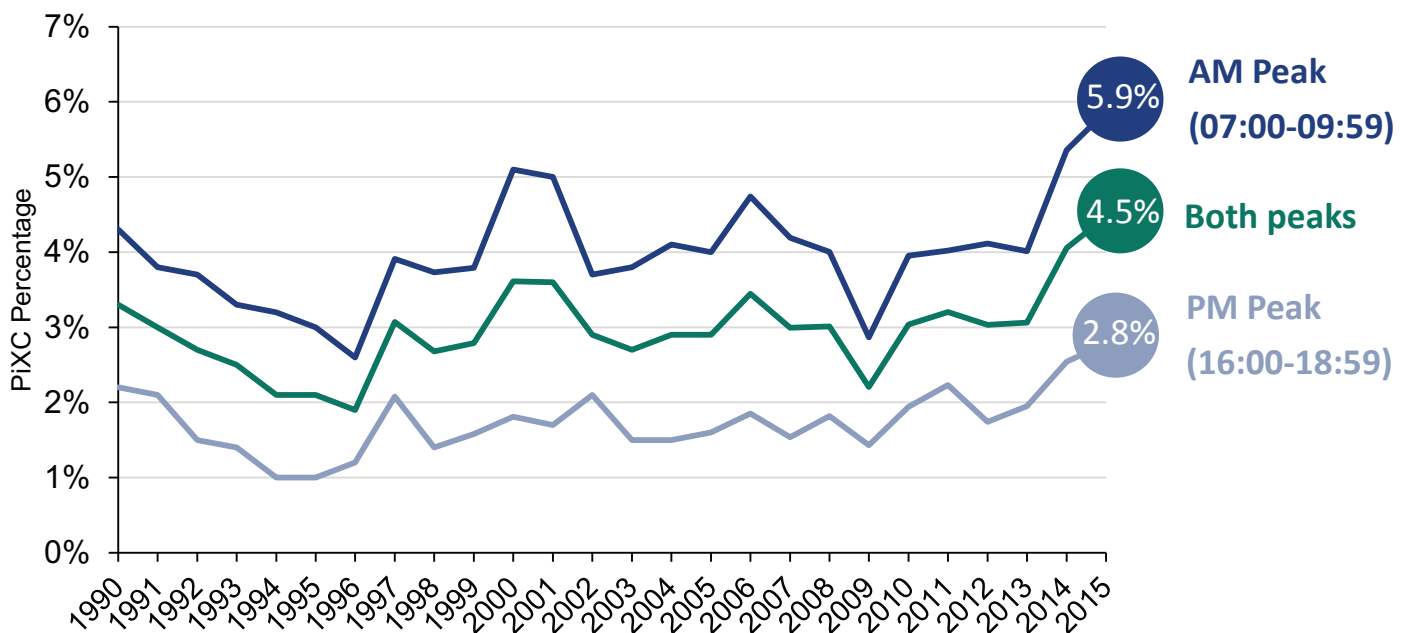
Note: This series does not include Long Distance operators' services (East Midlands Trains, Virgin Train East Coast and Virgin Trains West Coast). Long Distance operators' services are included for all other London statistics.

- Overall PiXC for London & South East operators remained at around 3% in the 2000's, then in 2009 dropped to 2.2%, which is likely due to passenger demand falling during the recession that ended in late 2009. Since 2013 there have been increases in PiXC, which is now at its highest level since the time series began.

- In London, PiXC tends to be higher for the morning peak than for the afternoon peak, reflecting larger passenger numbers and the higher concentration of commuters in the morning peak period compared to the afternoon peak hours.

Chart 6: Percentage of PiXC and passengers standing in the morning peak by major London station, 2015
**(Rail web table RAI0213)**
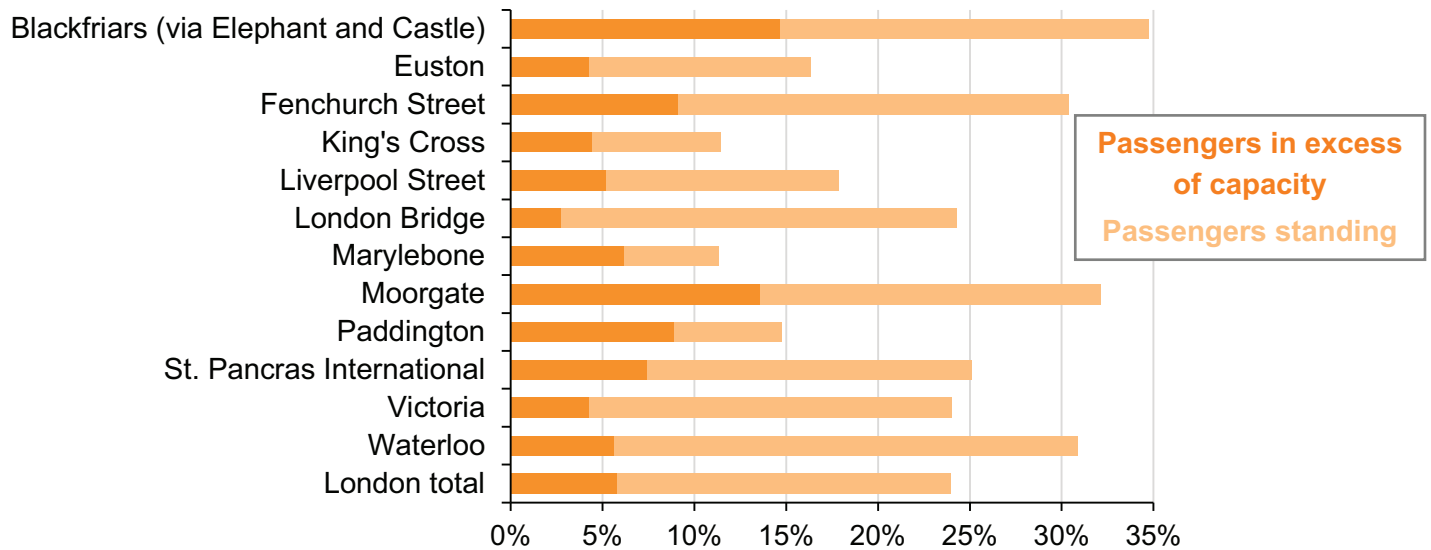
- Overall demand for routes into London during the peaks has risen. The crowding level at Blackfriars in 2015 (via Elephant and Castle) in the morning peak rose by 3.8 percentage points, the largest increase of all major London stations, and is now at 14.7% PiXC, the highest level of all major London stations. The increase in PiXC may be partly explained by the increased number of passengers arriving into London Blackfriars due to long-term Thameslink Programme engineering work at London Bridge and the resultant diversion of a number of services.

- The largest decrease in morning peak PiXC was at London Paddington, where PiXC fell from 13.5% in 2014 to 8.9% in 2015, a decrease of 4.5 percentage points.

- Services into London Blackfriars (via Elephant & Castle) had the largest percentage of passengers standing in the morning peak at 35%, followed closely by Moorgate with 32% and Waterloo with 31%. Marylebone had the lowest percentage of standing passengers, at 11 %.

- St. Pancras International had the highest afternoon peak PiXC (6.3%) and Waterloo had the highest number of passengers standing in the afternoon peak (25.0%).

Chart 7: Number of morning peak passenger arrivals at major London stations, with PiXC and passengers standing
(Rail web table [RAI0213](#))
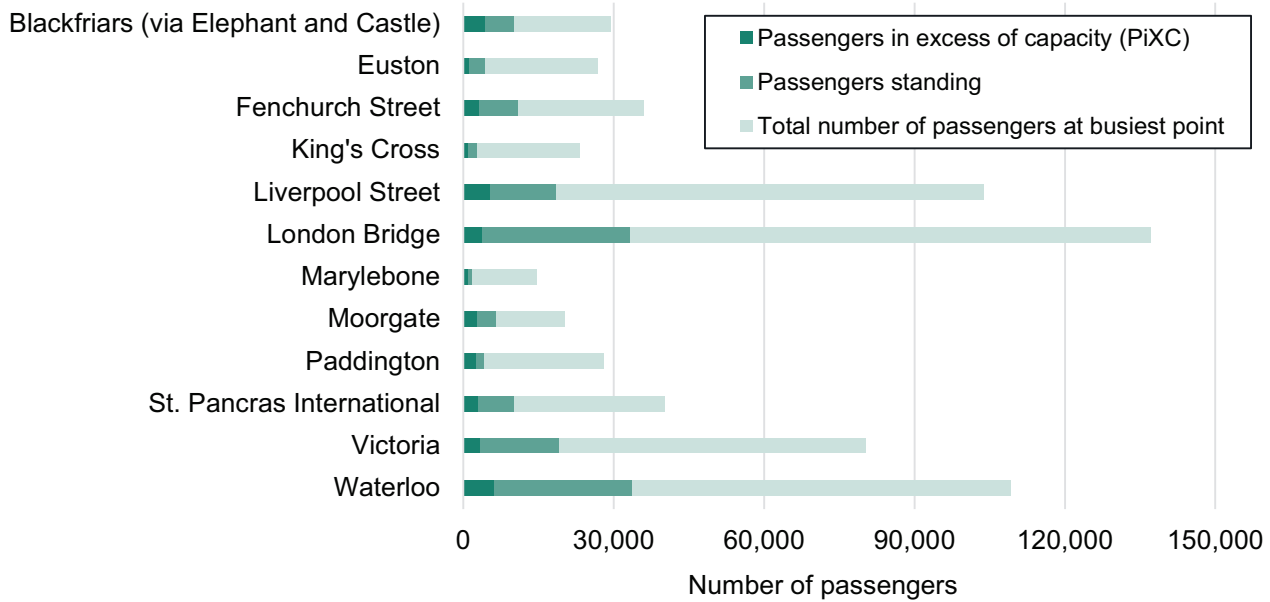
- Although Blackfriars and Moorgate had the highest levels of crowding and passengers standing, the actual number of passengers in excess of capacity at these stations were less than for Waterloo and Liverpool Street. This is due to differences in the number of passengers and services at each station.

Figure 3: PiXC and standing across the morning and afternoon peaks at major London stations; 2015
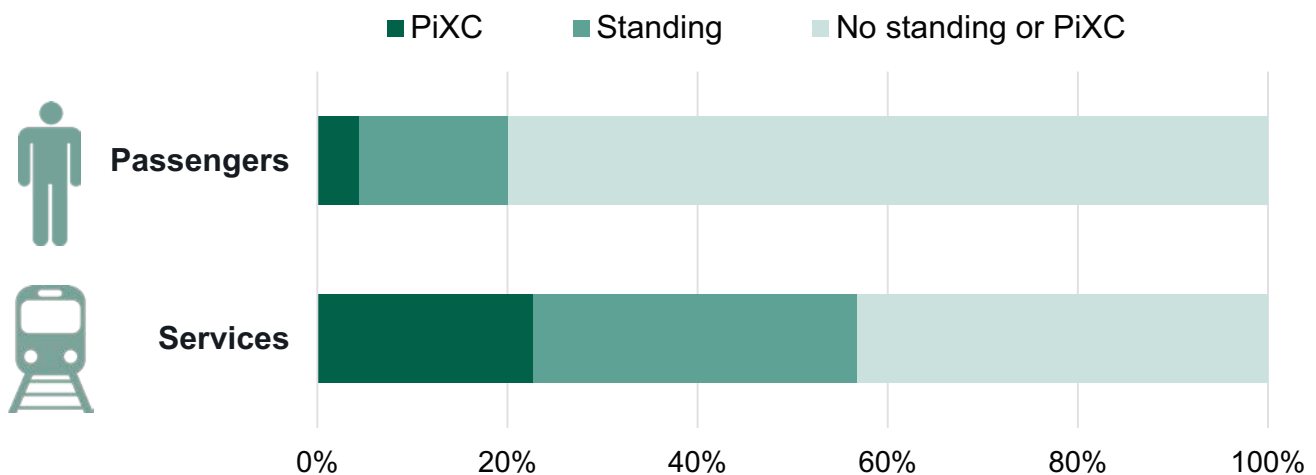
- Of all **passengers** arriving and departing major London stations in the morning and afternoon peaks, there were 20.1% of passengers standing, and 4.4% PiXC.

- For **services** arriving and departing major London stations in the morning and afternoon peaks, there were 57% of services with passengers standing, and 23% of services with PiXC.

Major London stations

🚂 Blackfriars (via Elephant and Castle)

Most services at London Blackfriars operate on the Thameslink route, which runs from north of London through to the south and down to Brighton via St. Pancras and Elephant and Castle.

London Blackfriars had the largest percentage of crowding of all major London stations, with 14.7% PiXC in the morning peak and 5.4% PiXC in the afternoon peak. This is an increase of 3.8 percentage points and 2.0 percentage points respectively from 2014, the largest increases of any major London station.

Blackfriars	In the AM peak	In the PM peak
Passenger numbers	29,300	17,500
Number of services	42	37
Percentage of passengers in excess of capacity (PiXC)	14.7%	5.4%
Change in PiXC from 2014	⭕3.8 pp	⭕2.0 pp
Percentage of passengers standing	34.7%	15.9%
Change in passengers standing from 2014	⭕7.9 pp	⭕0.5 pp

These increases can be partly explained by the disruption caused by the Thameslink Programme at London Bridge. As a result of this disruption, some services previously servicing London Bridge were displaced to London Blackfriars during autumn 2015. The Thameslink Programme is a substantial programme to upgrade track infrastructure and to provide over 1,300 new coaches, and is due for completion in 2018.

**Chart 8: PiXC and standing by TOC for Blackfriars
(Rail web table RAI0215)**
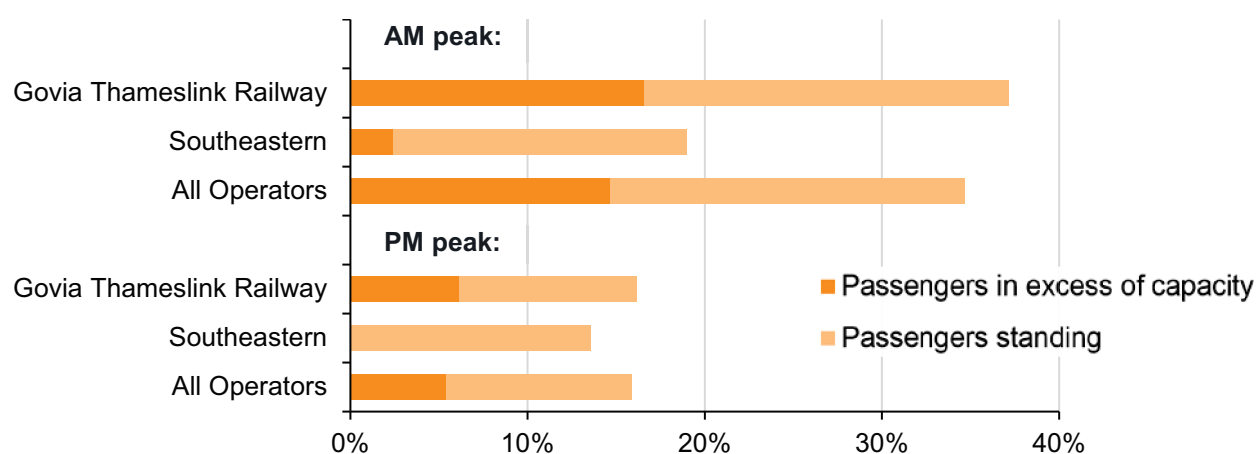
🚆 Euston

London Euston is served by three TOCs; London Midland, London Overground, and Virgin Trains West Coast which only runs long distance services.

Euston has seen a small overall decrease of 0.1 percentage points in PiXC for both peaks combined, though it has increased by 0.7 percentage points in the morning peak.

PiXC at Euston is most prevalent on London Midland services. London Overground has higher levels of standing passengers than London Midland (54% in the morning peak and 45% in the afternoon peak), but its 'metro' style trains are specifically designed to accommodate a large number of standing passengers.

Euston	In the AM peak	In the PM peak
Passenger numbers	28,900	28,300
Number of services	63	70
Percentage of passengers in excess of capacity (PiXC)	4.3%	3.9%
Change in PiXC from 2014	⋂ 0.7 pp	⋃ 0.9 pp
Percentage of passengers standing	16.3%	12.5%
Change in passengers standing from 2014	⋂ 0.8 pp	⋃ 1.3 pp

Chart 9: PiXC and standing by TOC for Euston (Rail web table RAI0215)
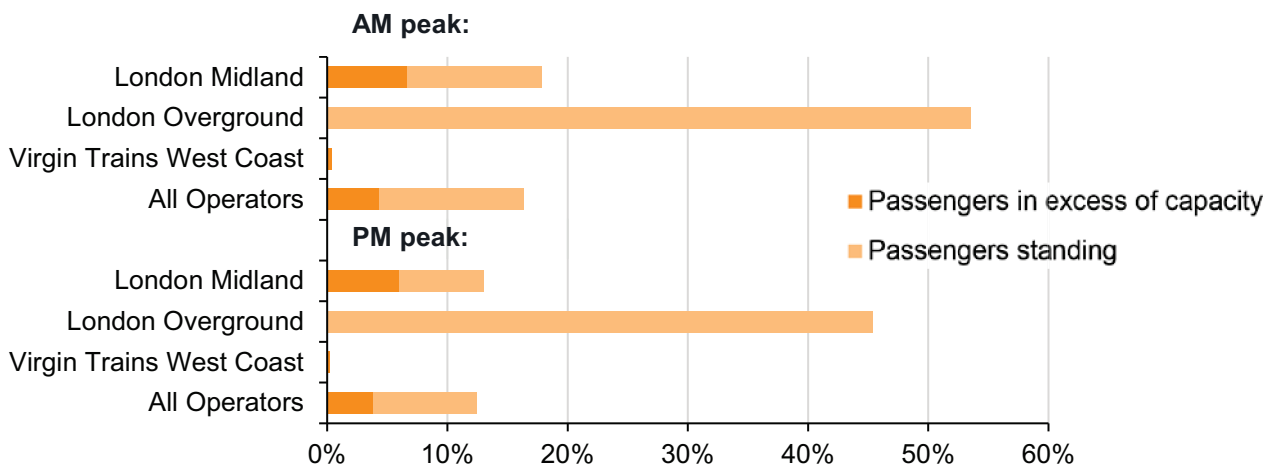
🚆 Fenchurch Street

The only train operator to serve London Fenchurch Street is c2c, which runs services between London and Essex.

Over both peaks, PiXC was 6.6% in 2015, an increase from 4.9% in 2014. There was also an increase in the percentage of passengers standing overall from 23.4% in 2014 to 25.8% in 2015.

Fenchurch Street	In the AM peak	In the PM peak
Passenger numbers	25,500	21,600
Number of services	48	44
Percentage of passengers in excess of capacity (PiXC)	9.1%	3.7%
Change in PiXC from 2014	⋂ 2.1 pp	⋂ 1.3 pp
Percentage of passengers standing	30.4%	20.6%
Change in passengers standing from 2014	⋂ 2.1 pp	⋂ 2.9 pp

🚆 King's Cross

London King's Cross is served by Great Northern, and Virgin Trains East Coast which only operates long distance services.

King's Cross has one of the lowest crowding levels of all major London stations, at 3.6% for both peaks combined. Virgin Trains East Coast has no PiXC or passengers standing on any of its peak services.

🚆 Liverpool Street

London Liverpool Street is served by four operators, Abellio Greater Anglia, c2c, London Overground and TfL Rail.

TfL Rail began operating in May 2015, when services to Shenfield were transferred from Abellio Greater Anglia. At the same time, services to Cheshunt, Chingford and Enfield Town were transferred to London Overground from Abellio Greater Anglia. c2c only run occasional non-peak services to Liverpool Street and so are not included in the peak PiXC statistics.

PiXC for both peaks combined has increased slightly by 0.2 percentage points since 2014, though PiXC in the morning peak has decreased from 5.5% in 2014 to 5.2% in 2015.

King's Cross	In the AM peak	In the PM peak
Passenger numbers	20,400	20,600
Number of services	48	50
Percentage of passengers in excess of capacity (PiXC)	4.4%	2.6%
Change in PiXC from 2014	⬆1.7 pp	⬇ 0.2 pp
Percentage of passengers standing	11.4%	5.0%
Change in passengers standing from 2014	⬆ 6.2 pp	⬇ 0.6 pp

Liverpool Street	In the AM peak	In the PM peak
Passenger numbers	70,500	64,200
Number of services	154	148
Percentage of passengers in excess of capacity (PiXC)	5.2%	2.8%
Change in PiXC from 2014	⬇ 0.3 pp	⬆ 0.7 pp
Percentage of passengers standing	17.9%	10.8%
Change in passengers standing from 2014	⬆ 1.5 pp	⬆ 2.0 pp

Chart 10: PiXC and standing by TOC for Liverpool Street (Rail web table RAI0215)
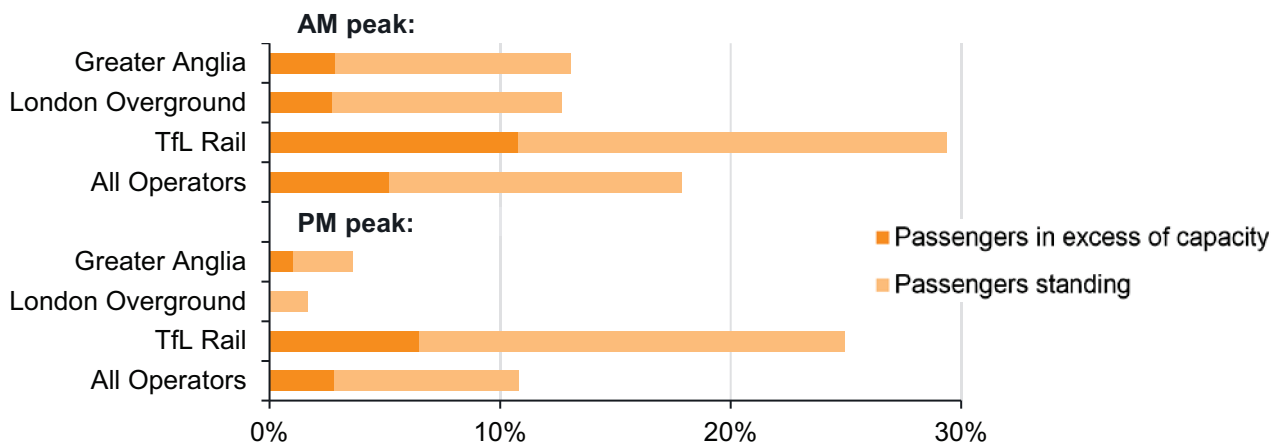
🚆 London Bridge

London Bridge is served by Thameslink, Southern and Southeastern. The statistics for London Bridge include services which terminate at either Charing Cross via Waterloo East, or Cannon Street.

There were 5,900 fewer passengers arriving in the morning peak and 8,200 fewer passengers departing in the afternoon peak in 2015 compared to 2014. This reflects a temporary reduction in Thameslink and Southeastern services running to London Bridge due to London Bridge station being upgraded as part of the Thameslink Programme.

London Bridge	In the AM peak	In the PM peak
Passenger numbers	137,400	107,900
Number of services	188	182
Percentage of passengers in excess of capacity (PiXC)	2.8%	0.7%
Change in PiXC from 2014	⬇0.5 pp	⬆ 0.2 pp
Percentage of passengers standing	24.3%	13.0%
Change in passengers standing from 2014	⬇0.7 pp	⬇ 1.3 pp

Despite this, London Bridge has the largest number of morning and afternoon peak passengers of any major London station.

PiXC at London Bridge has remained largely unchanged with a 0.2 percentage point decrease in PiXC in 2015 compared to 2014. London Bridge also has the lowest PiXC of any major London station considered in these statistics.

Chart 11: PiXC and standing by TOC for London Bridge (Rail web table RAI0215)
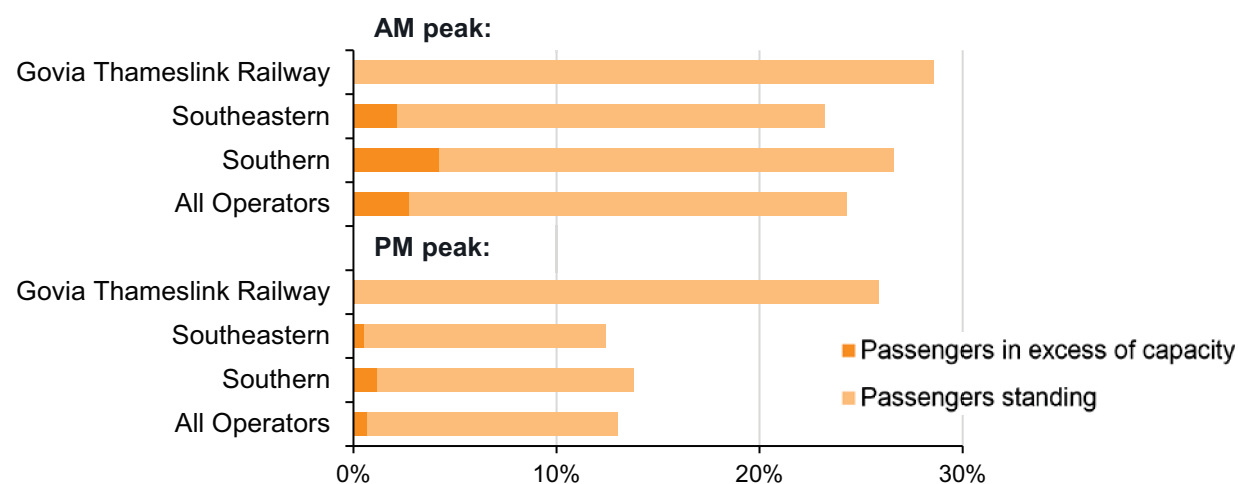
🚊 Marylebone

London Marylebone is solely served by Chiltern Railways with services towards Oxford, Aylesbury and Birmingham.

Marylebone has the lowest number of passenger arrivals in the morning peak of any major London station.

PiXC at Marylebone has largely remained unchanged with a 0.2 percentage point increase in PiXC for both peaks combined compared to 2014.

Marylebone	In the AM peak	In the PM peak
Passenger numbers	14,400	12,500
Number of services	44	44
Percentage of passengers in excess of capacity (PiXC)	6.2%	1.7%
Change in PiXC from 2014	⬆ 1.3 pp	⬇ 1.2 pp
Percentage of passengers standing	11.3%	4.8%
Change in passengers standing from 2014	⬆ 1.4 pp	⬇ 1.6 pp

🚊 Moorgate

Services to London Moorgate enter central London via Old Street and all services to the station are operated by Great Northern.

Moorgate had the second highest morning peak PiXC of any major London station in 2015 at 13.6%, which is an increase of 2.9 percentage points since 2014. However, PiXC in the afternoon peak decreased more than at any other major London station, from 5.4% in 2014 to 1.1% in 2015.

Over the longer term GTR is due to begin operating a fleet of new trains to replace the existing rolling stock, which will offer more capacity.

Moorgate	In the AM peak	In the PM peak
Passenger numbers	14,400	9,500
Number of services	31	32
Percentage of passengers in excess of capacity (PiXC)	13.6%	1.1%
Change in PiXC from 2014	⬆ 2.9 pp	⬇ 4.4 pp
Percentage of passengers standing	32.1%	11.2%
Change in passengers standing from 2014	⬆ 5.0 pp	⬇ 7.6 pp

🚆 Paddington

Great Western Railway operate commuter and long distance services to London Paddington.

Paddington had the largest decrease of PiXC for both peaks combined of any major London station in 2015 compared to 2014, falling 10.1% in 2014 to 6.6% in 2015.

This is partly due to an increase of train capacity on the Great Western Railway network in 2015, particularly for London commuter services. Over the longer term, Great Western Railway are due to begin operating a fleet of new trains as part of the Government's Intercity Express Programme, which is designed to increase capacity on routes to London. Currently, a programme of electrification is underway on the Great Western mainline to accommodate the new fleet, and is due for completion over the coming years.

Paddington	In the AM peak	In the PM peak
Passenger numbers	27,300	23,100
Number of services	67	61
Percentage of passengers in excess of capacity (PiXC)	8.9%	4.0%
Change in PiXC from 2014	⬇ 4.5 pp	⬇ 2.0 pp
Percentage of passengers standing	14.8%	8.9%
Change in passengers standing from 2014	⬇ 6.0 pp	⬇ 3.8 pp

🚆 St. Pancras International

Thameslink provide most services to St. Pancras International, but services here also include Southeastern services on the High Speed 1 route as well as East Midlands Trains long distance services.

PiXC for both peaks combined largely remained unchanged with an increase of 0.1 percentage points in 2015 compared to 2014. However, the number of passengers standing increased by 3.2 percentage points compared with a year ago.

St. Pancras International	In the AM peak	In the PM peak
Passenger numbers	38,300	34,100
Number of services	70	71
Percentage of passengers in excess of capacity (PiXC)	7.5%	6.3%
Change in PiXC from 2014	⬆ 0.3 pp	⬇ 0.3 pp
Percentage of passengers standing	25.1%	21.3%
Change in passengers standing from 2014	⬆ 2.9 pp	⬆ 3.5 pp

**Chart 12: PiXC and standing by TOC for St. Pancras International (Rail web table RAI0215)**
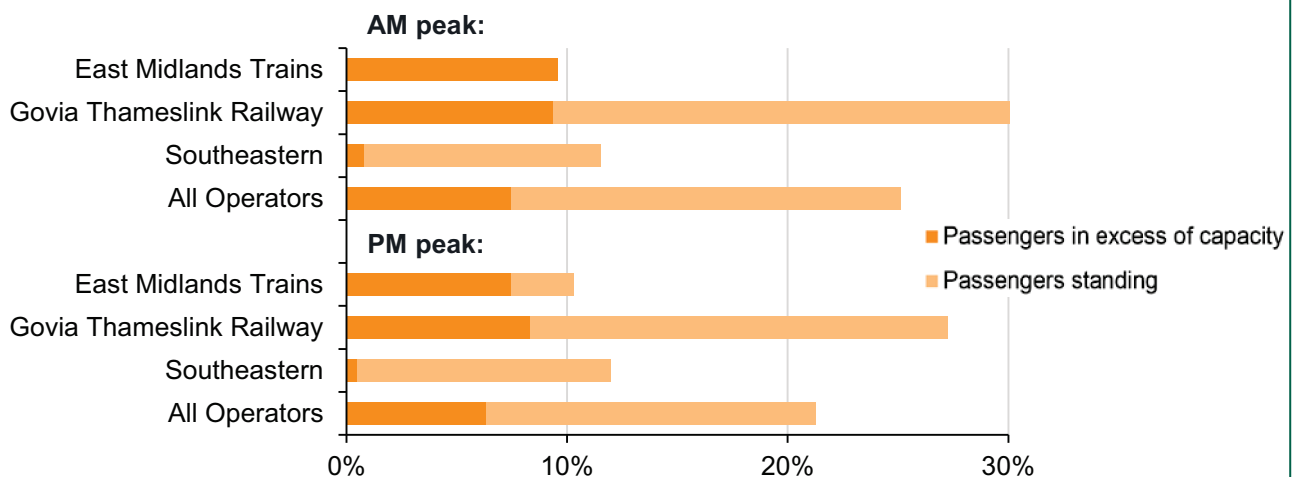
🚆 Victoria

Trains to and from London Victoria are operated by Gatwick Express, Southern and Southeastern.

PiXC for both peaks combined has increased to 2.8% in 2015, from 1.9% in 2014. However, Victoria has the second lowest PiXC of all major London stations.

Victoria	In the AM peak	In the PM peak
Passenger numbers	64,600	55,700
Number of services	123	122
Percentage of passengers in excess of capacity (PiXC)	4.3%	1.2%
Change in PiXC from 2014	⭕ 1.0 pp	⭕ 0.9 pp
Percentage of passengers standing	24.0%	15.6%
Change in passengers standing from 2014	⭕ 2.9 pp	⭕ 1.8 pp

Chart 13: PiXC and standing by TOC for Victoria (Rail web table RAI0215)
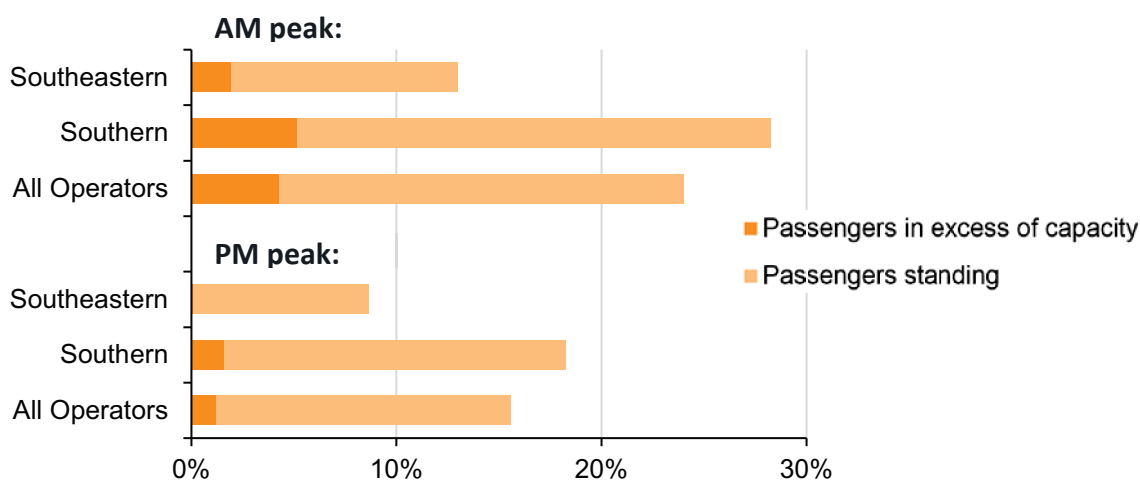
🚆 Waterloo

Services for London Waterloo are operated by Stagecoach South West Trains, and pass the Zone 1 boundary at Vauxhall. Passengers and services to Waterloo East are included in the figures for London Bridge.

Services towards Waterloo had the largest number of daily passengers of all major London stations, with 210,500 passenger arriving and 218,500 departing on a typical weekday in autumn 2015. PiXC for both peaks combined rose by 0.2 percentage points over the last year, and the number of passengers standing has seen an increase of 2.2 percentage points.

Waterloo	In the AM peak	In the PM peak
Passenger numbers	110,300	93,000
Number of services	151	148
Percentage of passengers in excess of capacity (PiXC)	5.6%	3.9%
Change in PiXC from 2014	⭕ 0.1 pp	⭕ 0.4 pp
Percentage of passengers standing	30.9%	25.0%
Change in passengers standing from 2014	⭕1.6 pp	⭕ 2.8 pp

A programme of investment is currently ongoing, which including upgrades at Waterloo station, a new fleet of trains for Stagecoach South West Trains, and lengthening of station platforms at Reading and other stations on suburban lines. These measures are designed to increase capacity and improve journeys.
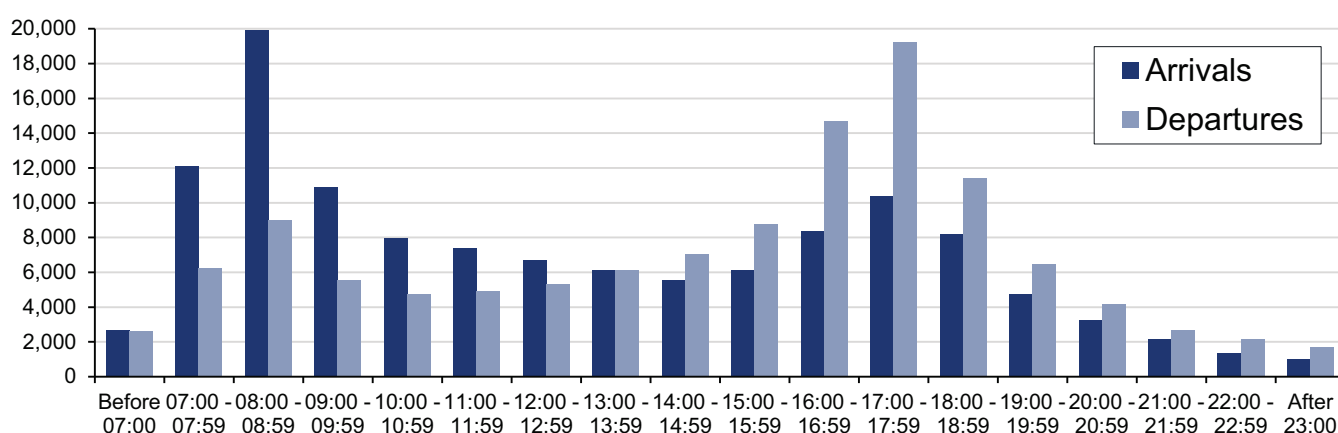
🚆 Birmingham

On an average weekday 125 thousand passengers in total travelled into Birmingham across the whole day. Birmingham has the largest number of passengers of any city outside London.

In September 2015, New Street station renovation work was completed, including construction of a larger station concourse, better pedestrian access and improved accessibility.

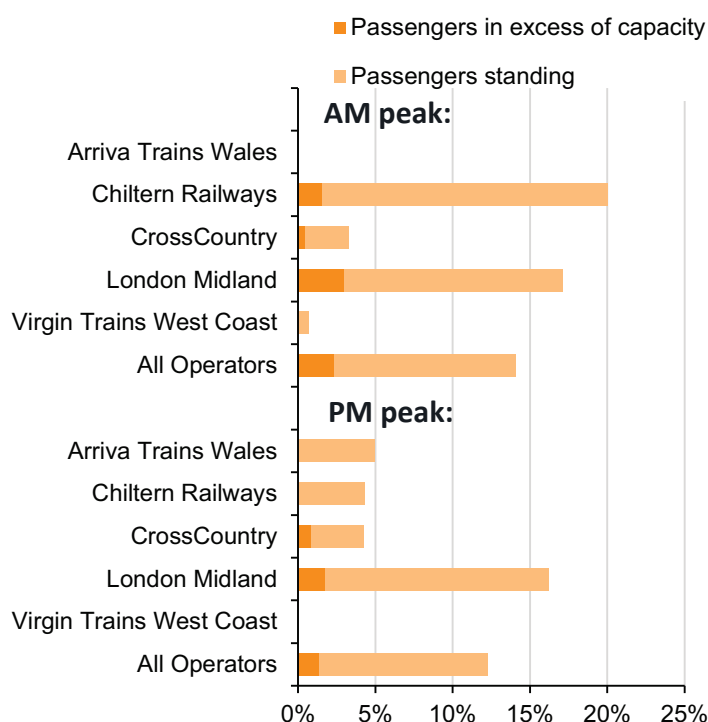**Chart 14: Arrivals and departures by time band: Birmingham, 2015 (Rail web table RAI0202)**

Key statistics for Birmingham:

Birmingham	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	42,900	45,300
Number of services	179	187
Percentage of passengers in excess of capacity (PiXC)	2.4%	1.4%
Percentage point change from 2014	⬆ 0.8 pp	⬆ 0.6 pp
Percentage of passengers standing	14.1%	12.3%
Percentage point change from 2014	⬆ 2.7 pp	⬆ 4.5 pp

➤ London Midland had the highest percentage of passengers in excess of capacity for both peaks, though Chiltern Railways had the highest percentage of passengers standing in the morning peak.
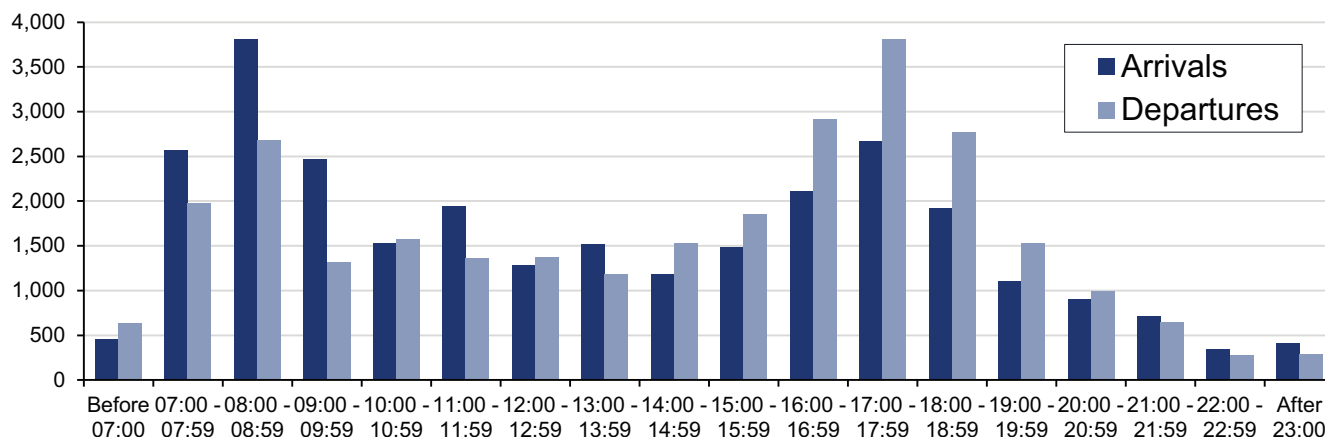
Chart 15: Passengers in excess of capacity by operator: Birmingham, 2015 (Rail web table RAI0214)

🚆 Bristol

Three train operators operate services in Bristol, with Great Western Railway providing the majority of services on both local and long-distance routes.

On an average weekday 9 thousand passengers arrived into central Bristol in the morning peak. Across the day 28 thousand passengers were on services arriving into Bristol.

## Chart 16: Arrivals and departures by time band: Bristol, 2015 (Rail web table RAI0202)

Key statistics for Bristol:

Bristol	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	8,900	9,500
Number of services	52	51
Percentage of passengers in excess of capacity (PiXC)	0.7%	2.2%
Percentage point change from 2014	⬆ 0.7 pp	⬆ 2.0 pp
Percentage of passengers standing	5.4%	9.6%
Percentage point change from 2014	⬆ 1.7 pp	⬆ 2.4 pp

➢ PiXC and passengers standing are both higher in the afternoon peak for Bristol, and most notably for Great Western Railway services.

Chart 17: Passengers in excess of capacity by operator: Bristol, 2015 (Rail web table RAI0214)
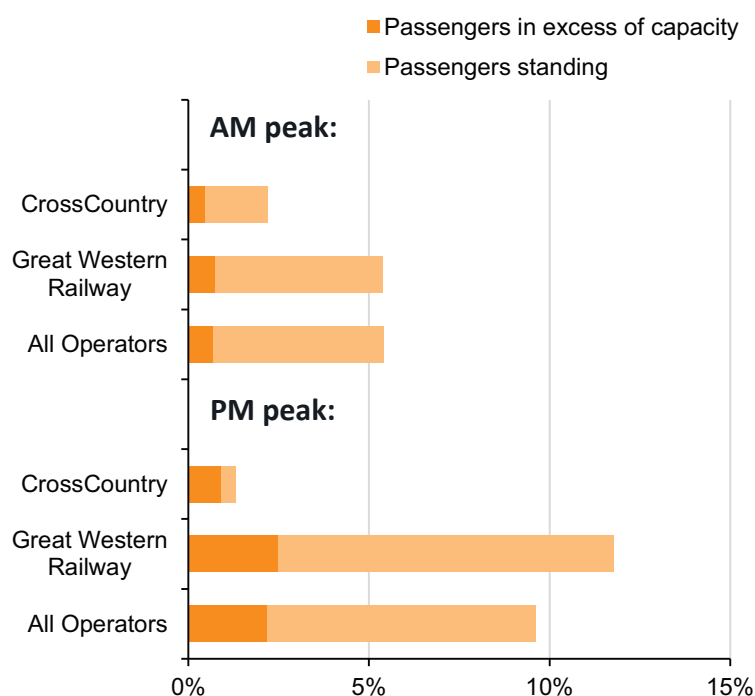

*Stagecoach South West Trains figures are not shown for confidentiality reasons

🚆 Cardiff

Three train operators operate services in Cardiff, with Arriva Trains Wales providing the majority of services on local commuter routes.

On an average weekday in autumn 2015, 13 thousand passengers arrived into central Cardiff in the morning peak and 14 thousand passenger departed from central Cardiff in the afternoon peak. Across the day 35 thousand passengers arrived and 37 thousand passengers departed Cardiff.

Chart 18: Arrivals and departures by time band: Cardiff, 2015 (Rail web table RAI0202)
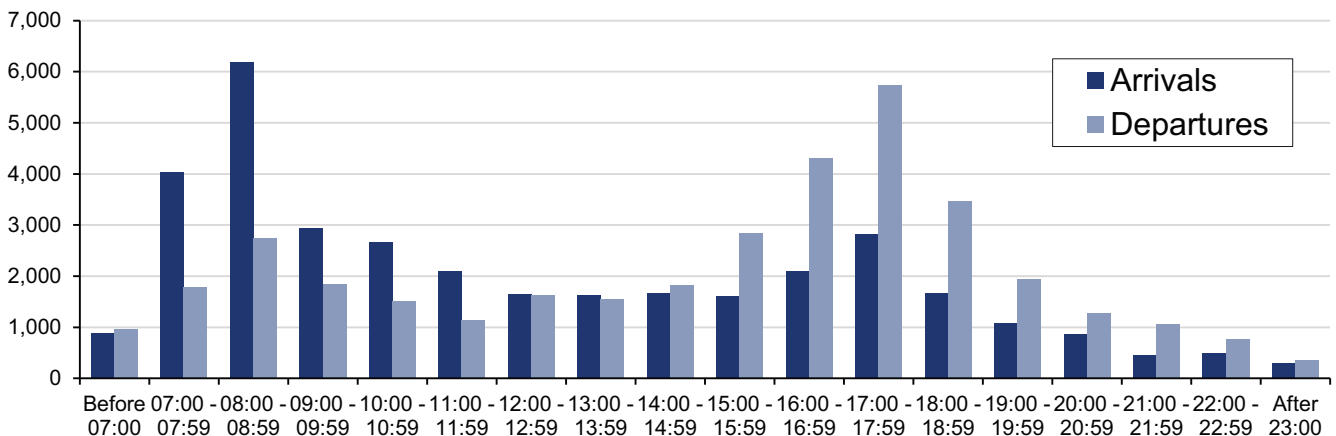
Key statistics for Cardiff:

Cardiff	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	13,200	13,500
Number of services	114	116
Percentage of passengers in excess of capacity (PiXC)	2.1%	1.4%
Percentage point change from 2014	⬆ 1.6 pp	⬆ 0.8 pp
Percentage of passengers standing	12.1%	7.8%
Percentage point change from 2014	⬆ 3.2 pp	⬆ 2.9 pp

➢ Arriva Trains Wales (ATW) provide the greatest number of services to and from Cardiff. ATW is the only train operator to have passengers standing in the AM peak, but standing occurs for all operators in the afternoon peak.
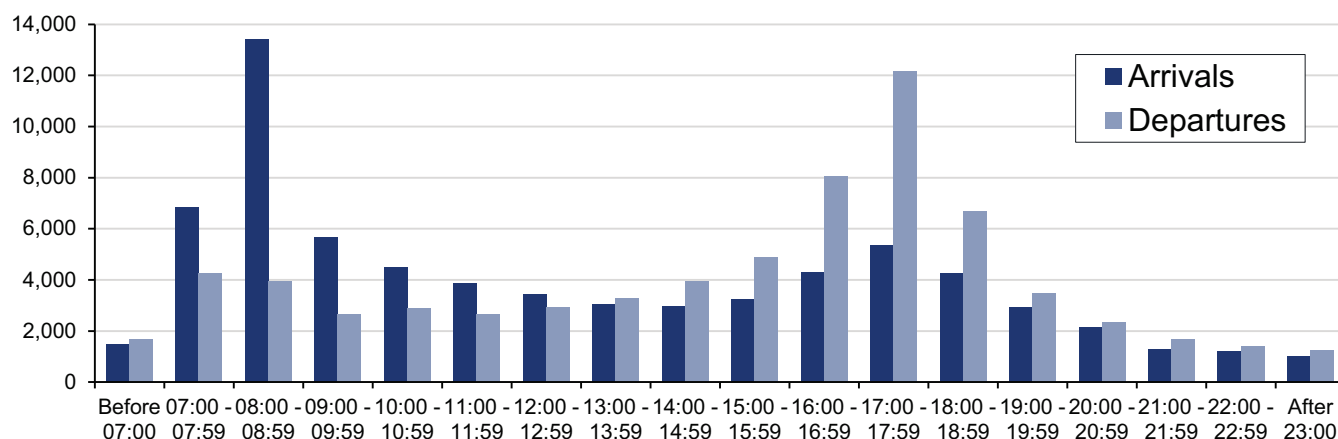
Chart 19: Passengers in excess of capacity by operator: Cardiff, 2015 (Rail web table RAI0214)
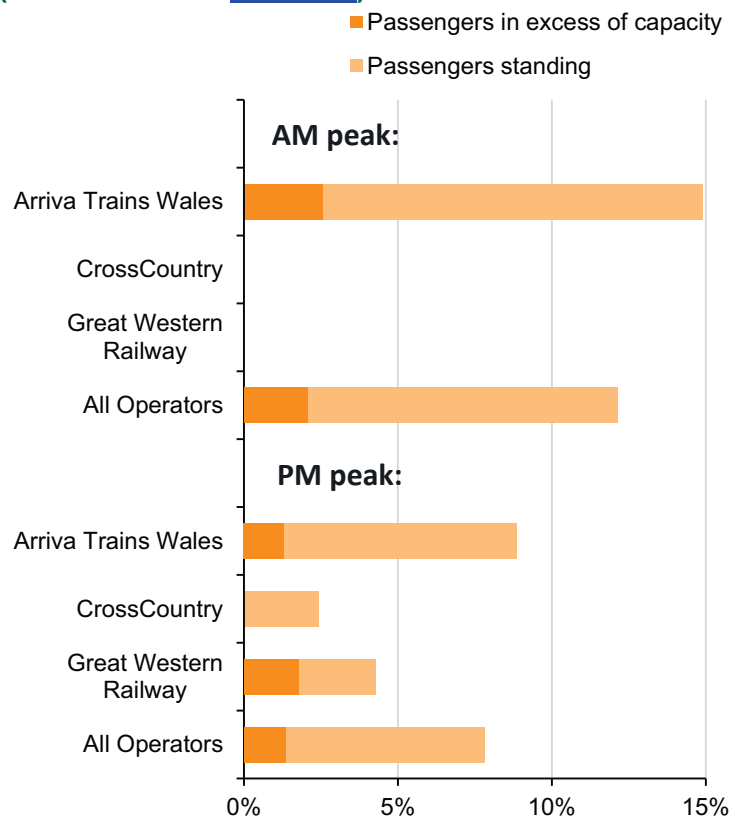
🚆 Leeds

Four train operators operate services in Leeds, with Northern providing the majority of services on local commuter routes.

On an average weekday in 2015, 71 thousand passengers were on services arriving into Leeds, of which 26 thousand arrived in the morning peak.

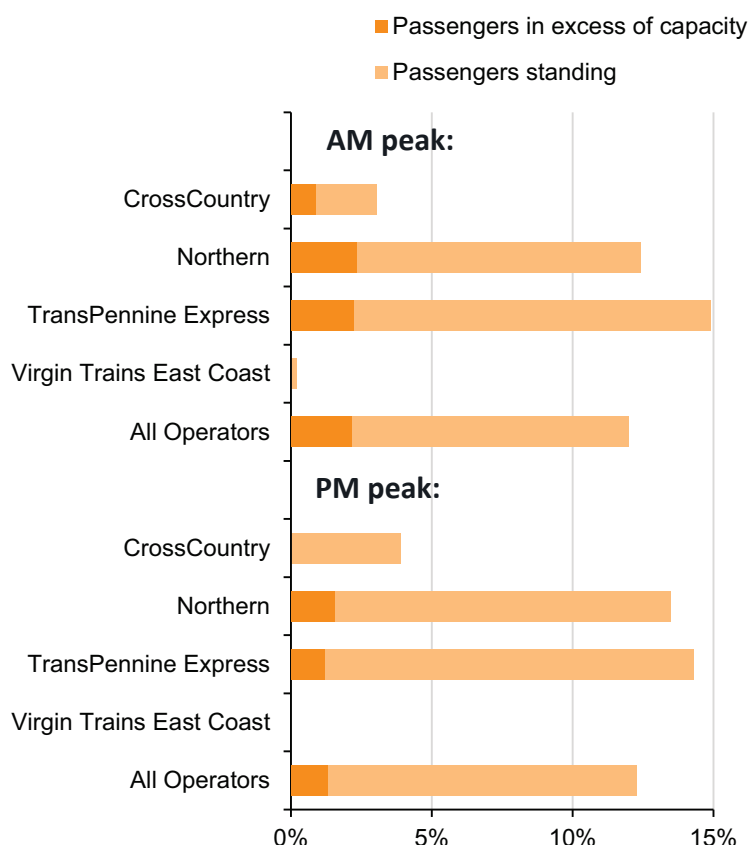**Chart 20: Arrivals and departures by time band: Leeds, 2015 (Rail web table RAI0202)**

Key statistics for Leeds:

Leeds	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	26,500	26,700
Number of services	119	122
Percentage of passengers in excess of capacity (PiXC)	2.2%	1.3%
Percentage point change from 2014	🔴 0.4 pp	🟢 0.1 pp
Percentage of passengers standing	14.1%	12.3%
Percentage point change from 2014	🔴 1.8 pp	🔴 1.8 pp

➢ The highest levels of crowding in the morning peak were on Northern services with 2.3% PiXC in the morning peak and 1.6% in the afternoon peak. However, a higher percentage of passengers were standing on TransPennine services at Leeds than on Northern services.
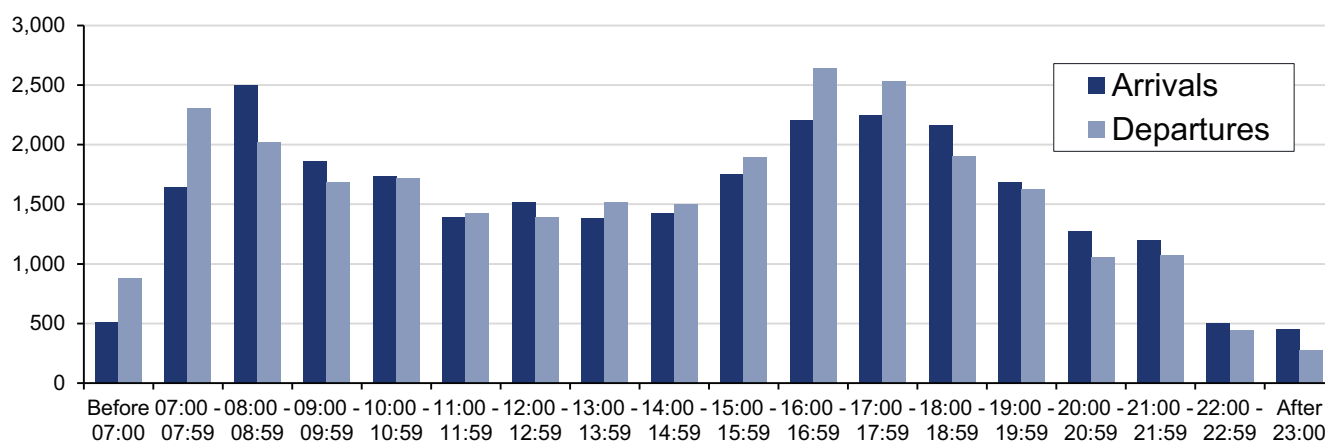
Chart 21: Passengers in excess of capacity by operator: Leeds, 2015 (Rail web table RAI0214)

🚆 Leicester

Two train operators operate services in Leicester, with East Midlands Trains providing the majority of services. Demand is generally more even across the day, with smaller increases in passenger numbers during peak times, than seen in other cities.

Across the day 27 thousand passengers were on services arriving into Leicester. These figures include passengers on trains passing through the city as well as those alighting there.

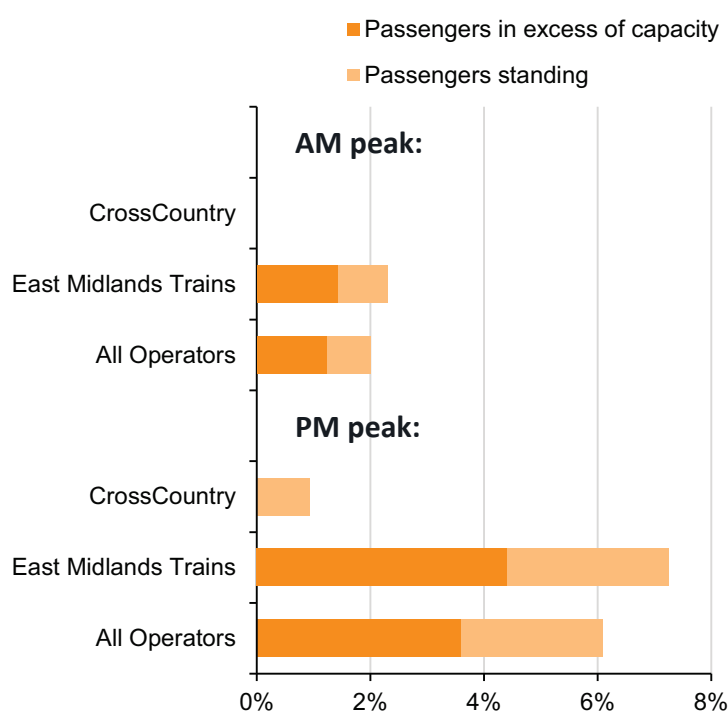**Chart 22: Arrivals and departures by time band: Leicester, 2015 (Rail web table RAI0202)**

Key statistics for Leicester:

Leicester	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	6,000	7,100
Number of services	37	37
Percentage of passengers in excess of capacity (PiXC)	1.2%	3.6%
Percentage point change from 2014	⌂ 0.2 pp	⌂ 0.7 pp
Percentage of passengers standing	2.0%	6.1%
Percentage point change from 2014	⌂ 1.0 pp	⌂ 0.2 pp

➢ There are more passengers in excess of capacity and more passengers standing in the PM peak compared to the AM peak for Leicester.
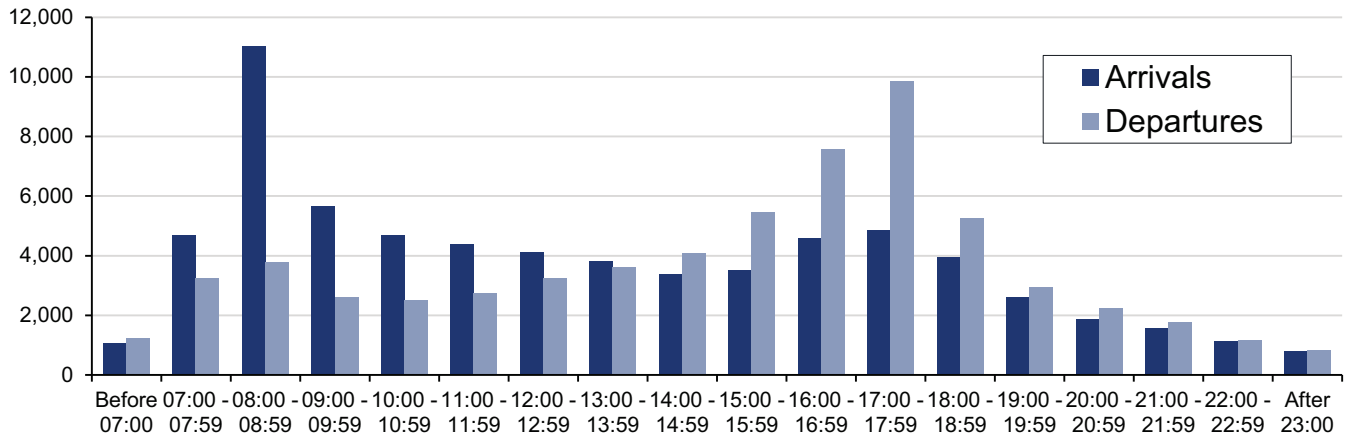
Chart 23: Passengers in excess of capacity by operator: Leicester, 2015 (Rail web table RAI0214)

🚆 Liverpool

Six train operators operate services in Liverpool, with Merseyrail providing the majority of services on local routes at central Liverpool underground stations. All other operators run services on routes to or from Liverpool Lime Street.

Across the day 68 thousand passengers were on services arriving into the city.

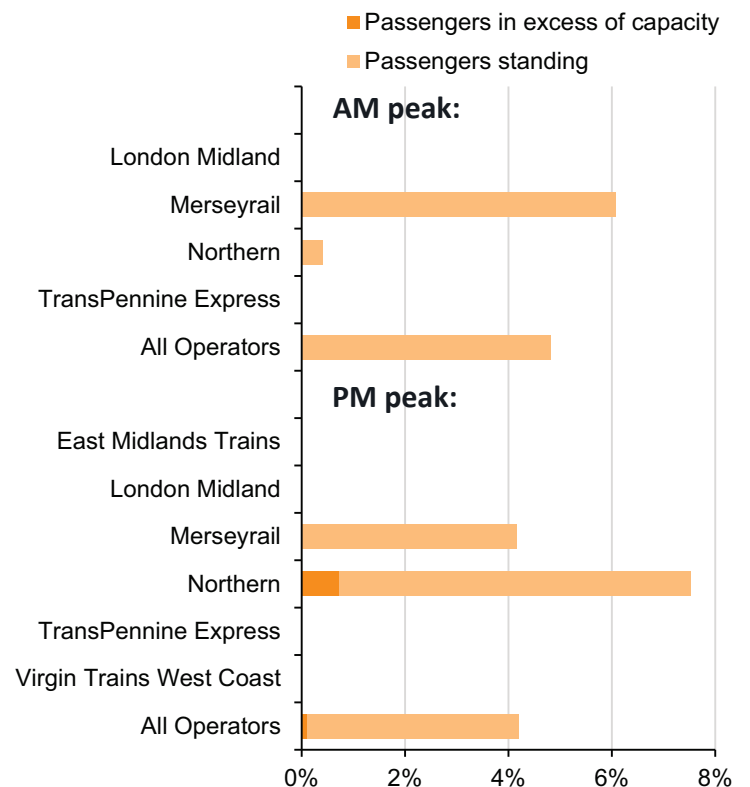## Chart 24: Arrivals and departures by time band: Liverpool, 2015 (Rail web table RAI0202)

Key statistics for Liverpool:

Liverpool	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	21,400	22,700
Number of services	128	139
Percentage of passengers in excess of capacity (PiXC)	0.0%	0.1%
Percentage point change from 2014	⟳ 0.0 pp	⬇ 0.3 pp
Percentage of passengers standing	4.8%	4.2%
Percentage point change from 2014	⬆ 1.3 pp	⬇ 1.2 pp

➤ Merseyrail had the largest percentage of passengers standing in the AM peak, but Northern had the largest percentage of passengers standing in the PM peak.

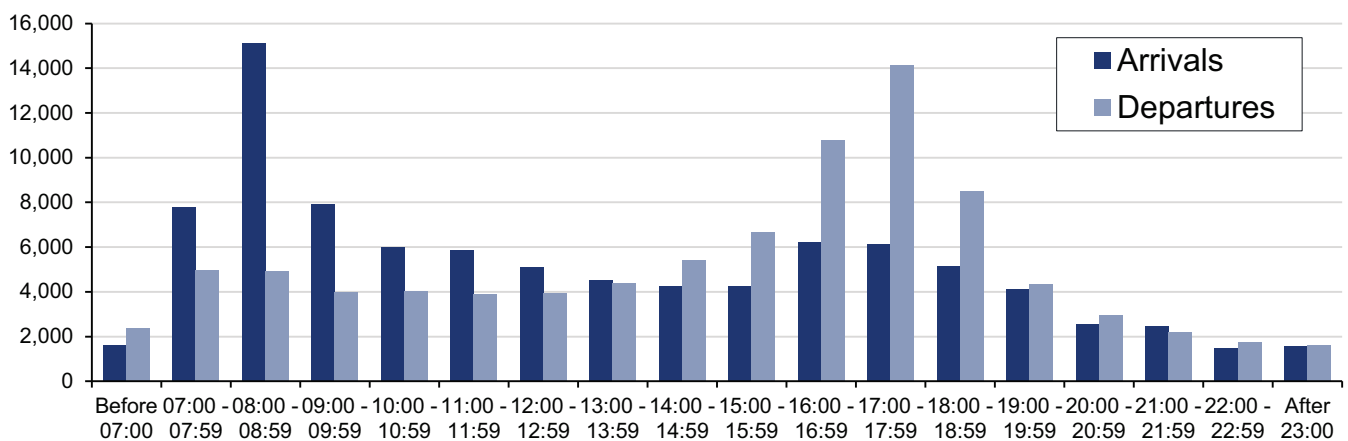## Chart 25: Passengers in excess of capacity by operator: Liverpool, 2015 (Rail web table RAI0214)

*East Midlands Trains and Virgin Trains West Coast figures in the AM peak are not shown for confidentiality reasons

🚆 Manchester

Six train operators run services to and from Manchester, with Northern providing the majority of these.

On an average weekday 31 thousand passengers arrived into central Manchester in the morning peak, the second highest number for any city outside London. Across the day 92 thousand passengers were on services arriving into Manchester.

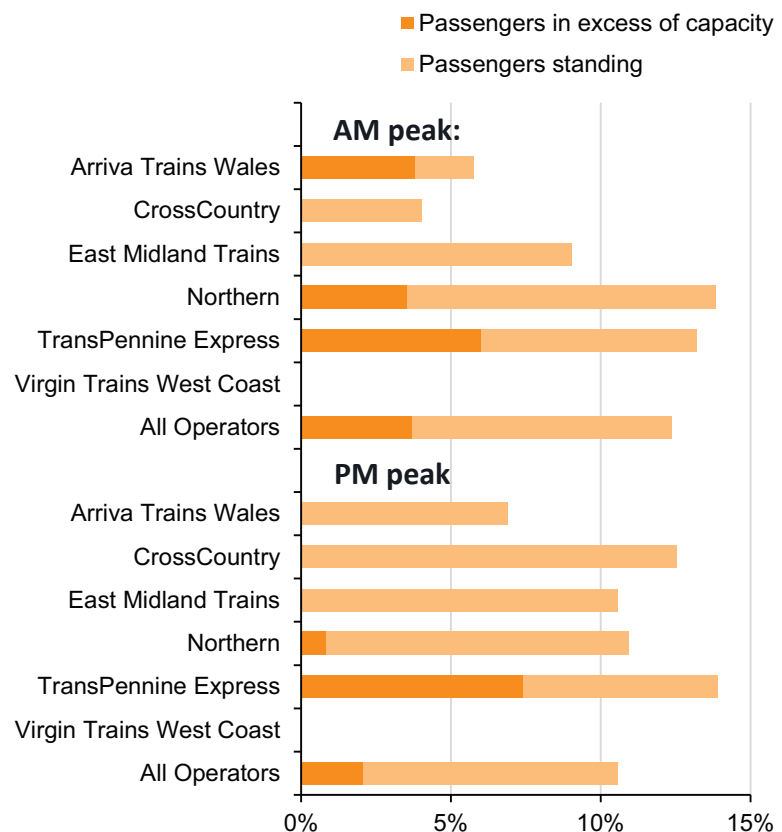## Chart 26: Arrivals and departures by time band: Manchester, 2015 (Rail web table RAI0202)

Key statistics for Manchester:

Manchester	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	30,800	33,400
Number of services	180	184
Percentage of passengers in excess of capacity (PiXC)	3.7%	2.1%
Percentage point change from 2014	⬇ 0.6 pp	⬇ 0.3 pp
Percentage of passengers standing	12.4%	10.6%
Percentage point change from 2014	⬇ 3.3 pp	⬇ 1.2 pp

➢ Whilst Virgin Trains recorded no crowding or passengers standing in either peak, all other operators had some crowding at these times. TransPennine Express had the highest level of crowding in both the morning and afternoon peaks
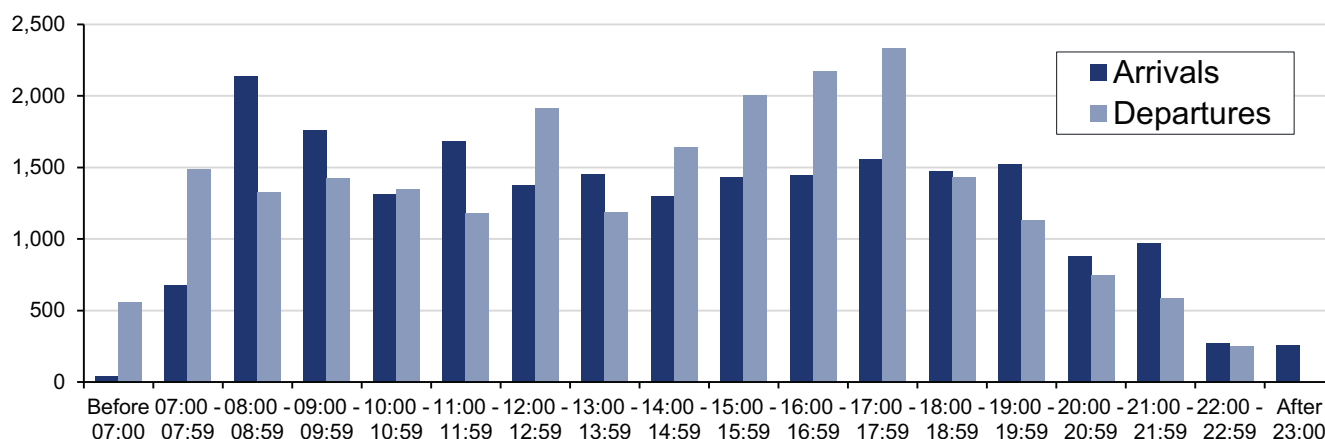
Chart 27: Passengers in excess of capacity by operator: Manchester, 2015 (Rail web table RAI0214)

🚆 Newcastle

Four train operators run services to and from Newcastle, with Northern providing the most services on local routes. CrossCountry and Virgin Trains East Coast provide longer distance services into and out of the city.

Across the day 22 thousand passengers were on services arriving into Newcastle.

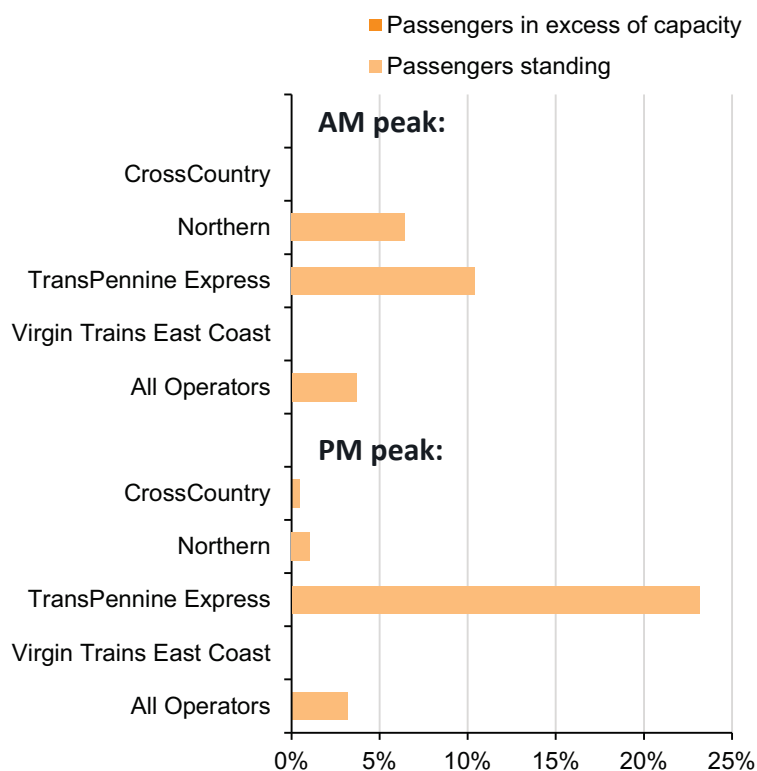## Chart 28: Arrivals and departures by time band: Newcastle, 2015 (Rail web table RAI0202)

Key statistics for Newcastle:

Newcastle	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	4,600	5,900
Number of services	35	38
Percentage of passengers in excess of capacity (PiXC)	0.0%	0.0%
Percentage point change from 2014	⮑ 1.0 pp	⮑ 0.0 pp
Percentage of passengers standing	3.7%	3.2%
Percentage point change from 2014	⮑ 0.6 pp	⮑ 0.4 pp

Chart 29: Passengers in excess of capacity by operator: Newcastle, 2015 (Rail web table RAI0214)

➢ Newcastle services had no passengers in excess of capacity at either peak. The largest percentages of passengers standing were on TransPennine Express services.
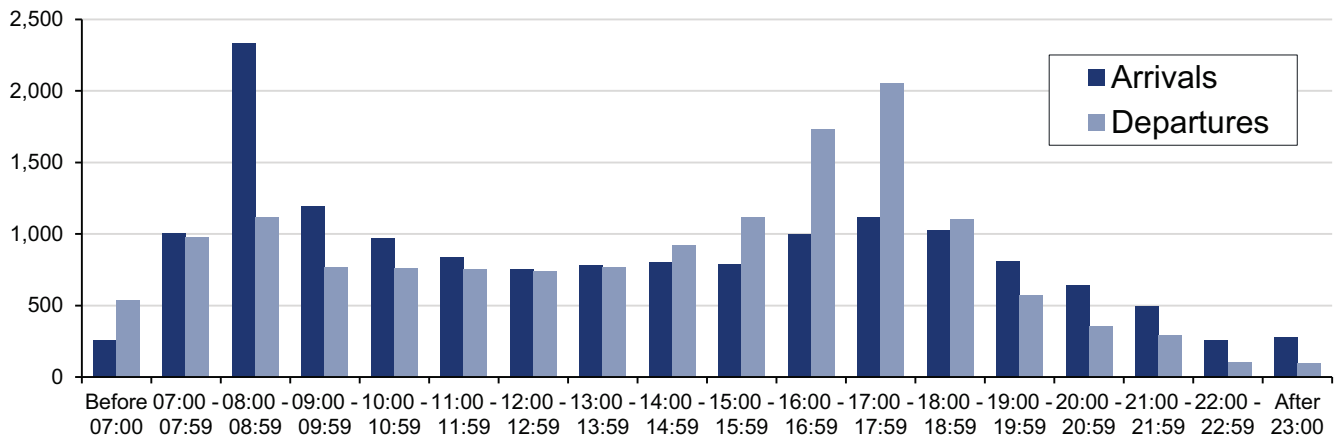
🚆 Nottingham

Three train operators operate services in Nottingham, with East Midlands Trains providing the majority of services.

Across the day 15 thousand passengers were on services arriving into Nottingham, the lowest number for any city in this publication.

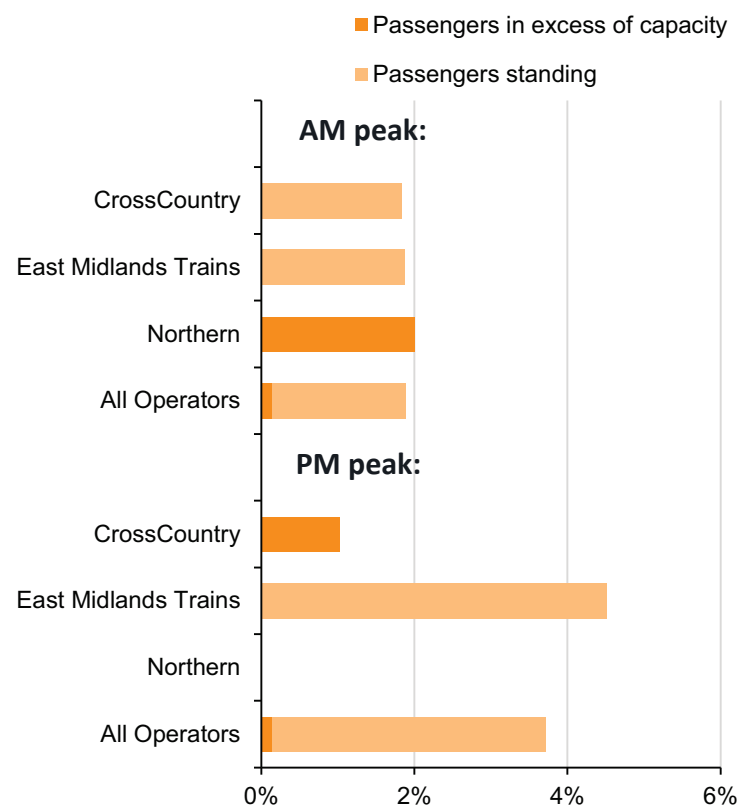## Chart 30: Arrivals and departures by time band: Nottingham, 2015 (Rail web table RAI0202)

Key statistics for Nottingham:

Nottingham	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	4,500	4,900
Number of services	38	42
Percentage of passengers in excess of capacity (PiXC)	0.1%	0.1%
Percentage point change from 2014	⬆ 0.1 pp	⬆ 0.9 pp
Percentage of passengers standing	1.9%	3.7%
Percentage point change from 2014	⬆ 1.9 pp	⬆ 1.3 pp

Chart 31: Passengers in excess of capacity by operator: Nottingham, 2015 (Rail web table RAI0214)

➢ Northern services have the highest percentage of PiXC in the AM peak. East Midlands Trains has the highest percentage of passengers standing in the PM peak.
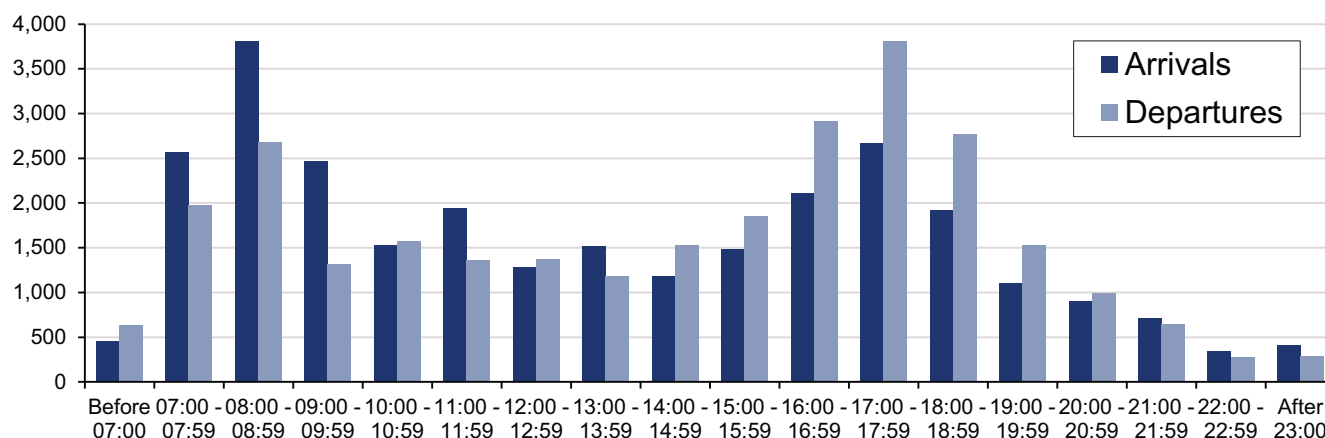
🚆 Sheffield

Four train operators provide services in Sheffield, with Northern operating around half of all services.

Across the day 32 thousand passengers were on services arriving into Sheffield.

## Chart 32: Arrivals and departures by time band: Sheffield, 2015 (Rail web table RAI0202)

Key statistics for Sheffield:

Sheffield	In the AM peak	In the PM peak
Passenger arrivals (AM) and departures (PM)	7,700	9,400
Number of services	58	63
Percentage of passengers in excess of capacity (PiXC)	1.6%	0.7%
Percentage point change from 2014	⬆ 0.5 pp	⬆ 0.1 pp
Percentage of passengers standing	6.3%	3.8%
Percentage point change from 2014	⬆ 1.3 pp	⬇ 0.5 pp

➢ TransPennine Express has the highest percentage of passengers standing in both peaks, while the few CrossCountry services that arrive in the AM peak have the highest percentage of PiXC.

Chart 33: Passengers in excess of capacity by operator: Sheffield, 2015 (Rail web table RAI0214)
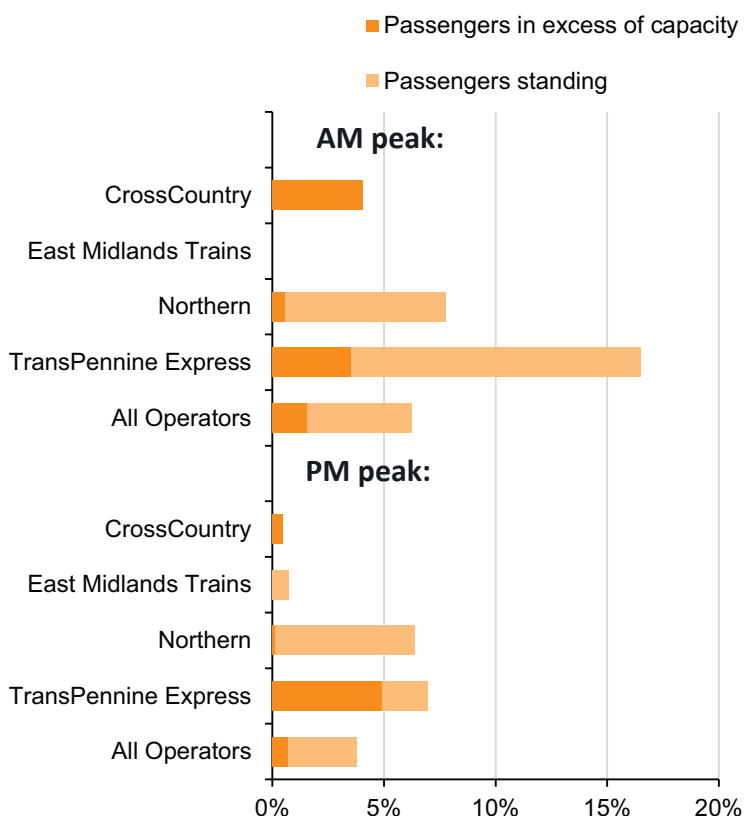
Strengths and weaknesses of the data

These statistics 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 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-weighing 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 other services 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/uploads/system/uploads/attachment_data/file/352512/rail-notes-definitions.pdf

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 and departures 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, by city and time band: annual from 2010
RAI0203	Central London arrivals and departures by rail in on a typical autumn weekday, by station and time band: annual from 2010

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 & South East train operators' services: annual from 1990
RAI0211	Passengers in excess of capacity (PiXC) on a typical autumn weekday by operator: London & South East train operators: annual from 2008
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 2010
RAI0215	Peak crowding on a typical autumn weekday in London by terminal and train operator: annual from 2010

Revisions

Following a change of methdology used for calculating PiXC where first class reduction factors apply, revisions have been made to the back series of PiXC statistics from 2011 to 2014. The change has not affected PiXC percentages in 2015, but there have been minor revisions to some percentage points changes compared with a year ago. For example, AM peak PiXC at London Bridge in 2014 increased from 3.1% to 3.2%, which affected the comparison between 2014 and 2015. More information on these revisions can be found in the notes and definitions document.

Definitions

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

Afternoon (PM) peak	All services that depart from a city centre terminal 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.
Automatic passenger count (APC)	A passenger count collected by electronic equipment fitted to a train, for example 'infra-red' or 'load weighing' systems.
Autumn period	The period from mid-September to mid-December, excluding school holidays and bank holidays.
City centre	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.
Cordon point	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.
Critical load point	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 from service to service, but will usually be at the same location for services on the same route.
Franchised train operator	A train operator that is franchised by DfT or another government body. Non-franchised train operators' services are not included in these statistics.
Manual passenger count	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.
Morning (AM) peak	All services arriving at a city centre terminal 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.
Number of passengers	Includes all standard and first class passengers on services when they arrive at or depart from the city centre (unless otherwise stated).
Number of services	The number of services that the statistics are based on. This includes all franchised train operators' services timetabled to run during the autumn period.
Passenger count	A count carried out by a train operator of the number of passengers on board a train at a particular point along its route.
Passengers in excess of capacity (PiXC)	The number of standard class passengers on a service that are in excess of the standard class capacity at the critical load point.
Passengers standing	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.
Total seats	Includes all standard and first class seats on services when they arrive at or depart from the city centre.
Service	A train service refers to a specific train that operates routinely during a timetable period between its origin and destination, for example, the 10:00 King's Cross – Aberdeen 17:06.
Standard class capacity	Includes the number of standard class seats on the service and may include a standing allowance. A standing allowance is included when the time between stations before (AM) or after (PM) the critical load point is 20 minutes or less.

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.

We are always keen to hear how these statistics are used and would welcome your views on this release. Comments and queries can be addressed to 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 2015 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 2016 statistics published in summer 2017.