



Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2013

Statistical Release

10 September 2014

These statistics are based on counts of the numbers of passengers on board trains on the national rail network. They show that on a typical autumn weekday in 2013:

- **Overall peak crowding across the 11 cities included in these statistics remains virtually unchanged since 2012**, with 2.6% of passengers in excess of capacity (PiXC), an increase of 0.1 percentage point. Crowding was higher in the 3 hour morning peak (7-10am), which had 3.4% PiXC compared to 1.7% in the afternoon peak (4-7pm).
- **Crowding was higher in London than in other cities**, with 3.1% PiXC in London compared to 1.0% PiXC across the other 10 cities. The highest crowding outside London was in Sheffield, which had 2.6% PiXC.
- In London, **120 thousand passengers had to stand at trains' busiest points in the morning peak**, 20% of the overall total. 24% of morning peak trains were over capacity and in total 60% had passengers standing.
- **In the morning peak 545 thousand passengers arrived by rail into central London** (Zone 1 of the travelcard area), a 2% increase from the year before. Just under one million passengers arrived into central London by rail across the whole day.
- **The city outside London with the highest number of passengers was Birmingham**, with 39 thousand passengers on board trains arriving into the city centre in the morning peak. Manchester had 30 thousand morning peak arrivals and Leeds 24 thousand.

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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 of PiXC on each service are added together and shown as a percentage of the total number of 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.

About this release

This publication presents rail passenger numbers on trains throughout the day in several major cities and the levels of peak crowding in these cities. The statistics in this report are based on passenger counts carried out by franchised train operators of the numbers of passengers using their services in autumn 2013. They represent passenger numbers on national rail services on a 'typical weekday'.

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1. Main findings

Crowding

The summary table below shows the latest PiXC crowding figures from 2013 for the routes into each city and London terminal, including the percentage point change from the year before. Note that because passenger numbers fluctuate from day to day and may vary across the autumn period this can have an impact on the statistics, depending on the sample of days on which particular services are counted. Therefore, small differences in the crowding figures between routes or between years should be treated with some caution.

Table 1: Passengers in excess of capacity (PiXC) by city: 2013, and percentage point change from 2012 (Rail web table [RAI0209](#))

City	AM peak		PM peak		Both peaks	
	PiXC	Change from 2012	PiXC	Change from 2012	PiXC	Change from 2012
Birmingham	0.7%	↕0.2%	0.9%	↘0.1%	0.8%	↔0.0%
Bristol	1.2%	↕0.7%	0.8%	↕0.3%	1.0%	↕0.5%
Cardiff	1.0%	↕0.4%	0.4%	↕0.4%	0.7%	↕0.4%
Leeds	1.5%	↘0.6%	1.6%	↕0.1%	1.5%	↘0.3%
Leicester	1.2%	↕0.8%	0.9%	↘0.3%	1.0%	↕0.2%
Liverpool	0.3%	↔0.0%	0.0%	↘0.1%	0.1%	↘0.1%
Manchester	2.6%	↕0.5%	0.7%	↘0.4%	1.6%	↕0.1%
Newcastle	0.0%	↔0.0%	0.0%	↘0.3%	0.0%	↘0.2%
Nottingham	0.0%	↘0.2%	0.0%	↔0.0%	0.0%	↘0.1%
Sheffield	4.0%	↕1.6%	1.5%	↕0.1%	2.6%	↕0.8%
All cities outside London	1.3%	↕0.3%	0.8%	↘0.1%	1.0%	↕0.1%
Routes into London terminals						
Blackfriars (via Elephant and Castle)	10.2%	↕5.6%	1.5%	↕0.8%	6.7%	↕3.7%
Euston	4.6%	↕3.2%	5.3%	↕0.4%	4.9%	↕1.8%
Fenchurch Street	6.0%	↕1.4%	1.6%	↕0.7%	4.0%	↕1.0%
King's Cross	1.4%	↕0.9%	2.0%	↕1.4%	1.7%	↕1.1%
Liverpool Street	3.5%	↘0.7%	1.5%	↘0.3%	2.6%	↘0.5%
London Bridge	2.1%	↘0.7%	0.5%	↘0.4%	1.4%	↘0.6%
Marylebone	3.5%	↘5.1%	1.2%	↕0.3%	2.4%	↘2.7%
Moorgate	2.0%	↘0.6%	0.2%	↘0.8%	1.2%	↘0.6%
Paddington	9.7%	↕0.1%	8.7%	↕4.3%	9.2%	↕2.1%
St. Pancras	3.2%	↕1.1%	1.6%	↔0.0%	2.5%	↕0.6%
Victoria	3.5%	↘1.4%	0.6%	↘0.1%	2.2%	↘0.8%
Waterloo	5.0%	↔0.0%	2.9%	↘0.2%	4.0%	↘0.1%
London total	4.0%	↘0.1%	2.0%	↕0.2%	3.1%	↔0.0%
All cities (including London)	3.4%	↔0.0%	1.7%	↕0.1%	2.6%	↕0.1%

Note: All percentage point changes in this table are shown to one decimal place, with changes of less than 0.05 percentage points shown as unchanged.

- Overall crowding in 2013 has increased by a negligible amount since 2012 despite growing passenger numbers in most cities. This suggests that where there was growth in peak passenger numbers it was generally met with increased or better deployed capacity, or it occurred on routes with low levels of crowding where it could already be accommodated.
- The city with the largest increase in PiXC was Sheffield, which had a large increase in the morning peak, when the standard class critical load increased by 5.1%.

Key definitions:

The **critical load point** is the location in a city where the passenger load on a service is highest. For example, for a service arriving into Manchester Victoria in the morning peak the critical load point might be on arrival at Salford Crescent or Salford Central rather than at Manchester Victoria.

The **standard class critical load** is the number of standard class passengers on the service at the critical load point, and this is the passenger load upon which the crowding statistics are based.

- In London the standard class critical load increased by 2.2% in the morning peak, when PiXC fell slightly, and by 3.1% in the afternoon peak, when PiXC rose from 1.8% to 2.0%.
- The highest level of crowding in London was at Paddington, as it has been in recent years, where PiXC increased to 9.2%. This increase followed a 9.0% increase in the standard class critical load in the afternoon peak, leading to PiXC nearly doubling from 4.4% to 8.7%.
- There were large increases in PiXC accompanied by large increases in the standard class critical loads at Blackfriars, Euston, King's Cross and St Pancras. There was a large decrease in PiXC at Marylebone in the morning peak where capacity was increased, with three more services being run than in the previous year.
- Because PiXC is measured relative to the overall number of passengers in a city, larger cities may have more instances of crowding than a smaller city with a higher PiXC percentage. London, Manchester, Leeds and Birmingham all had more instances of crowding than Sheffield, even though Sheffield had a higher crowding level than some of these cities.

Passenger numbers

There has been a high level of growth in rail usage in recent years, such that the annual figures published by the Office of Rail Regulation (ORR) show the number of passenger journeys in Great Britain having more than doubled since rail privatisation, from 735 million in 1994/95 to 1.6 billion in the latest financial year (2013/14). They show continued growth in passenger numbers at the time that the passenger counts for the statistics in this release were carried out in 2013, with particularly high growth on local services in London and the South East compared to the year before.

Commuter travel into the major cities makes up a substantial component of the total. The National Travel Survey (NTS) suggests that on weekdays around 50% of rail trips in England are for

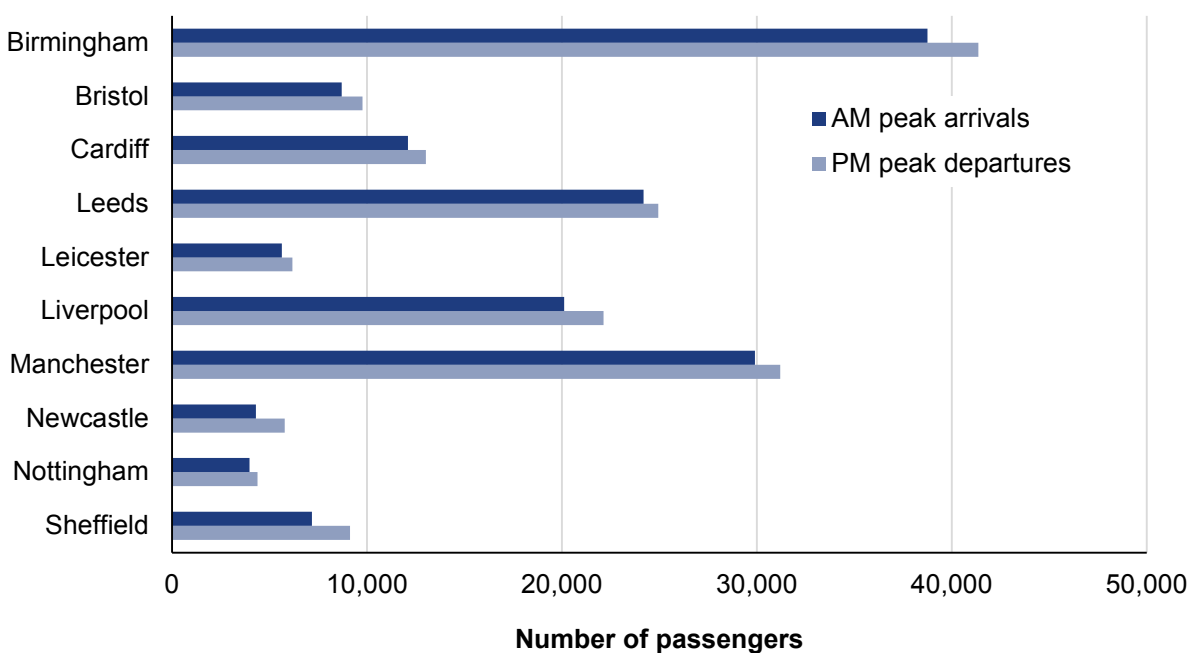
commuting purposes, and a further 10% are for business travel. Because this release focuses on travel into cities on weekdays during school term time, commuter journeys are likely to account for a much higher percentage of trips.

In addition to information about crowding, the statistics in this release also show the numbers of passengers travelling by rail in each city throughout the day. The passenger number statistics differ from the crowding statistics in that they include first class passengers as well as standard class passengers, and also because they show the numbers of passengers on board trains as they arrive at or depart from city centre stations, which are not always the critical load points.

- London had a much higher number of passengers travelling in and out of the city centre compared to any other city, with 545 thousand arrivals in the morning peak on a typical weekday in 2013 compared to 39 thousand in Birmingham, the second busiest city.
- As well as in Birmingham, there were also typically more than 20 thousand arrivals into the city centre during the morning peak each day in Manchester, Leeds and Liverpool.
- All cities outside London had a higher number of passengers departing during the 3 hours of the afternoon peak than arriving in the 3 hour morning peak. This is likely to be because there will have been more leisure travellers during the afternoon than in the morning, in addition to the large number of commuters.

The following chart shows the number of morning peak arrivals and afternoon peak departures in each city outside London on a typical autumn weekday in 2013.

Chart 1: City centre peak arrivals and departures by rail, excluding London: 2013
 (Rail web table [RAI0201](#))



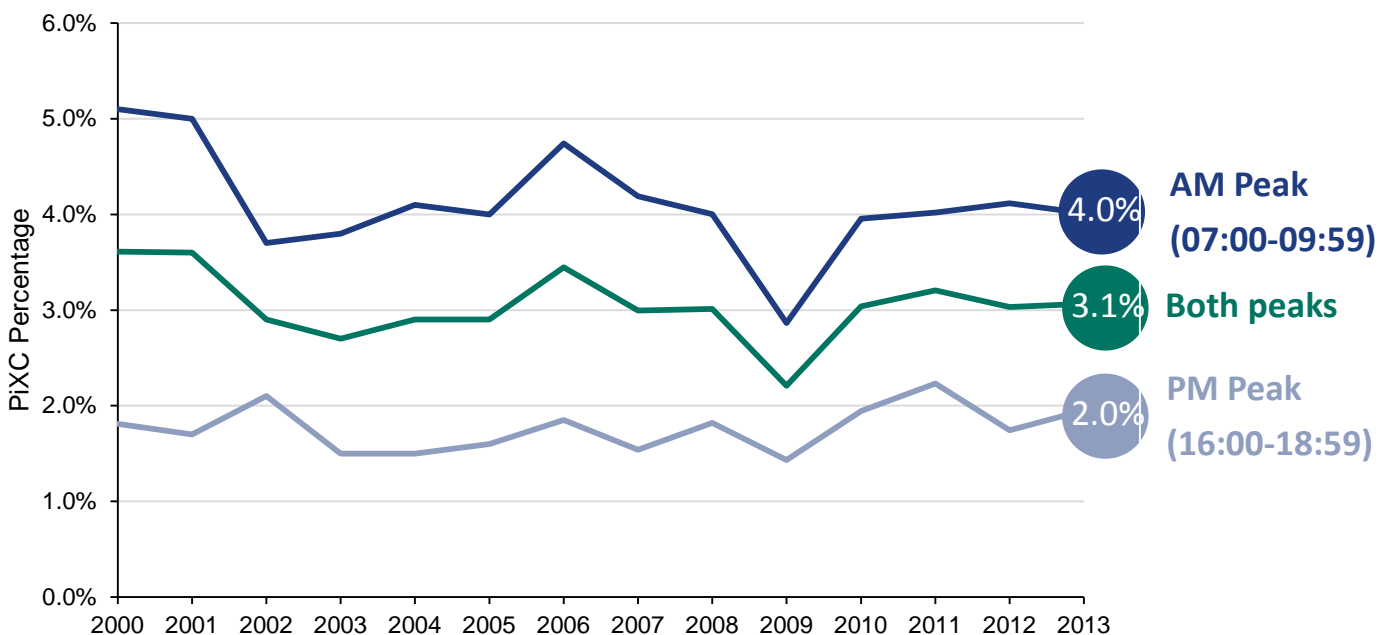
2. Results by city

London

On a typical weekday in autumn 2013, across both peaks, 3.1% of passengers were in excess of capacity (PiXC) on London & South East rail services. This was an increase from 3.0% PiXC in 2012. In the morning peak, crowding decreased slightly to 4.0% PiXC from 4.1% in 2012, but in the afternoon peak it increased from 1.7% PiXC in 2012 to 2.0% in 2013. The overall standard class critical loads in London rose slightly compared to 2012, with an increase of 2.2% in the morning peak and an increase of 3.1% in the afternoon peak.

Chart 2 shows how PiXC on London & South East rail services has changed over time. Overall PiXC for both peaks has fluctuated at around 3% for the last ten years, apart from 2009 when it dropped to 2.2%. The recession that ended in late 2009 is likely to have had an impact on this figure, as the number of passengers using London & South East operators' services fell at that time. Other than the fall in 2009, this fairly flat trend in peak crowding is set against a high level of growth in the overall number of journeys made on London & South East operators' services over this period.

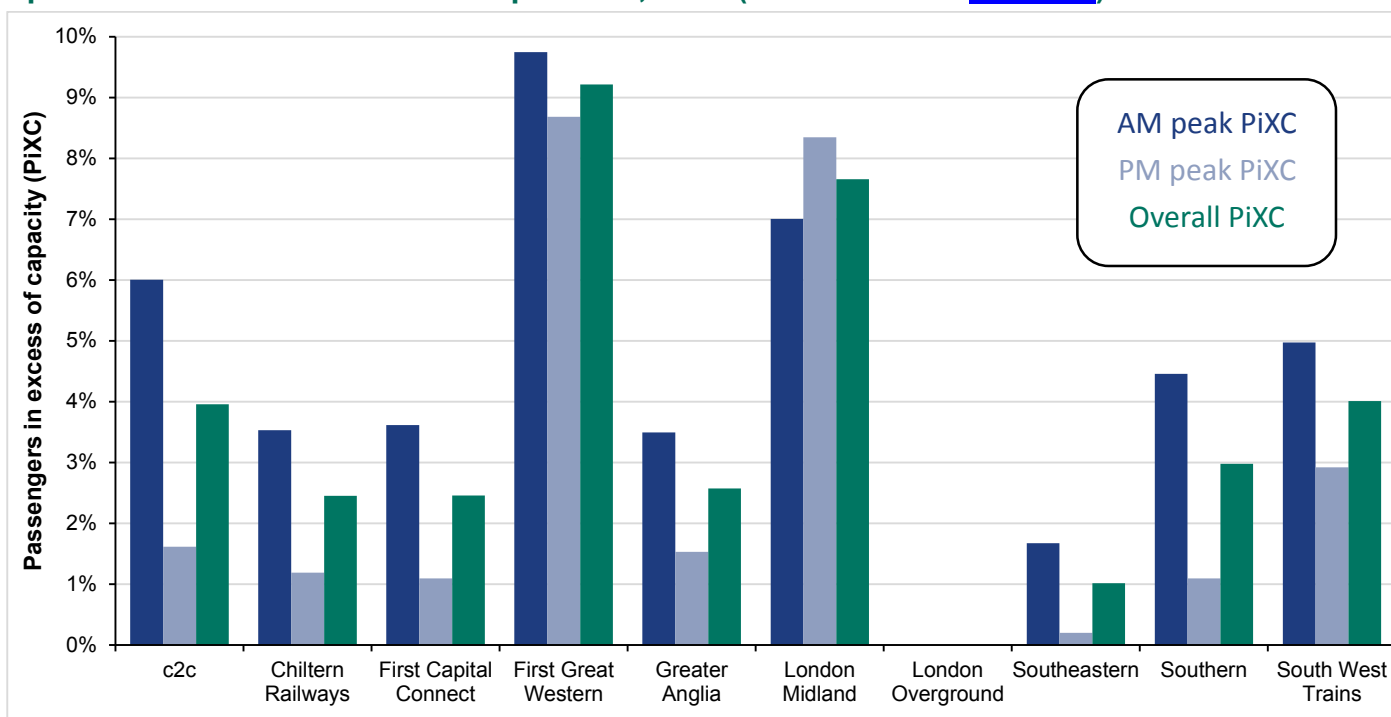
Chart 2: Passengers in excess of capacity (PiXC): London & South East operators, 2000-2013 (Rail web table [RAI0210](#))



In London, PiXC tends to be higher in the morning peak than the afternoon peak, reflecting the crowding caused by the more concentrated nature of commuter travel in the high peak hour in the morning (08:00 to 08:59) compared to the more evenly distributed nature of departures in the afternoon. In 2012, 5.8% of passengers were in excess of capacity in the morning high peak hour, compared to 2.3% across the rest of the morning peak. In the afternoon peak this figure was 2.0% in both the high peak hour (17:00 to 17:59) and across the whole peak.

- In the morning peak 24% of the 1,032 London services had passengers in excess of their capacity and 60% had passengers standing, compared to 12% of the 1,018 services in the afternoon peak having PiXC and 47% having passengers standing. These figures are greater for services arriving in the high peak (08:00 to 08:59), when 38% of services had PiXC and 81% of services had passengers standing.
- On an average weekday in autumn 2013, 120 thousand passengers were standing at the critical load point on arrival into London in the morning peak, equating to 20% of all passengers. 13% of passengers were standing at critical load points during the afternoon peak. These figures are slightly up on last year.

Chart 3: Passengers in excess of capacity (PiXC) in the morning and afternoon peaks by operator: London & South East operators, 2013 (Rail web table [RAI0211](#))



- First Great Western had the highest level of crowding of any London & South East operator in 2013 with 9.2% PiXC across both peaks, an increase from 7.1% in 2012. This increase occurs mainly in the afternoon peak where the PiXC figure rose from 4.4% in 2012 to 8.7% in 2013 and follows an increase in the afternoon peak critical load of 9.0% from the previous year. Despite the high PiXC figure, the proportion of passengers standing on First Great Western peak services is lower than for a number of other operators, partly because a large number of passengers commute between Reading and London using long-distance services on which standing is not included in the PiXC measure, so every passenger standing on these services is in excess of the capacity.
- London Midland had 7.7% PiXC in 2013, the second highest figure for any London & South East operator, with an increase in its morning peak PiXC from 1.8% in 2012 to 7.0% in 2013. This follows a 20.1% increase in the standard class critical load in the morning peak between

2012 and 2013. PiXC has fluctuated over the last few years for London Midland. Unlike most operators, it had more PiXC in the afternoon than in the morning, with 8.3% PiXC in the afternoon peak in 2013 compared to 7.0% in the morning peak.

- London Overground had the lowest PiXC of any train operator in 2013, with no PiXC in either peak for the fourth year running. This follows the introduction of new high-capacity, metro-style rolling stock on the Watford DC line in 2010. These trains are designed to carry a high number of standing passengers but have limited numbers of seats compared to most other rolling stock, resulting in London Overground having the highest proportion of passengers standing of any operator, with 50.8% standing in the morning peak and 45.4% in the afternoon peak.

Chart 4: Passengers in excess of capacity (PiXC) and passengers standing in the morning peak by London terminal: 2013 (Rail web table [RAI0213](#))

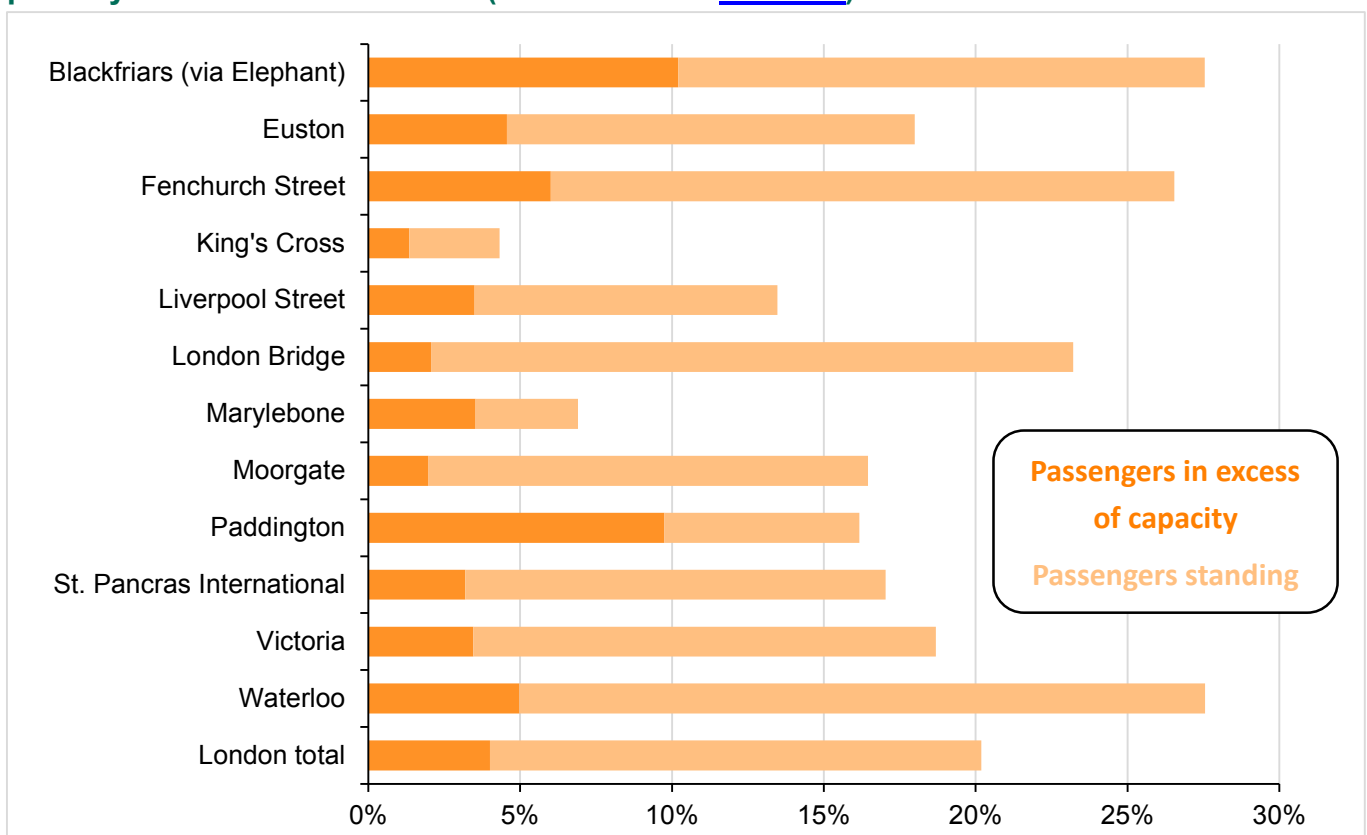


Chart 4 compares the percentages of PiXC and passengers standing on the routes into each London terminal in the morning peak in 2013.

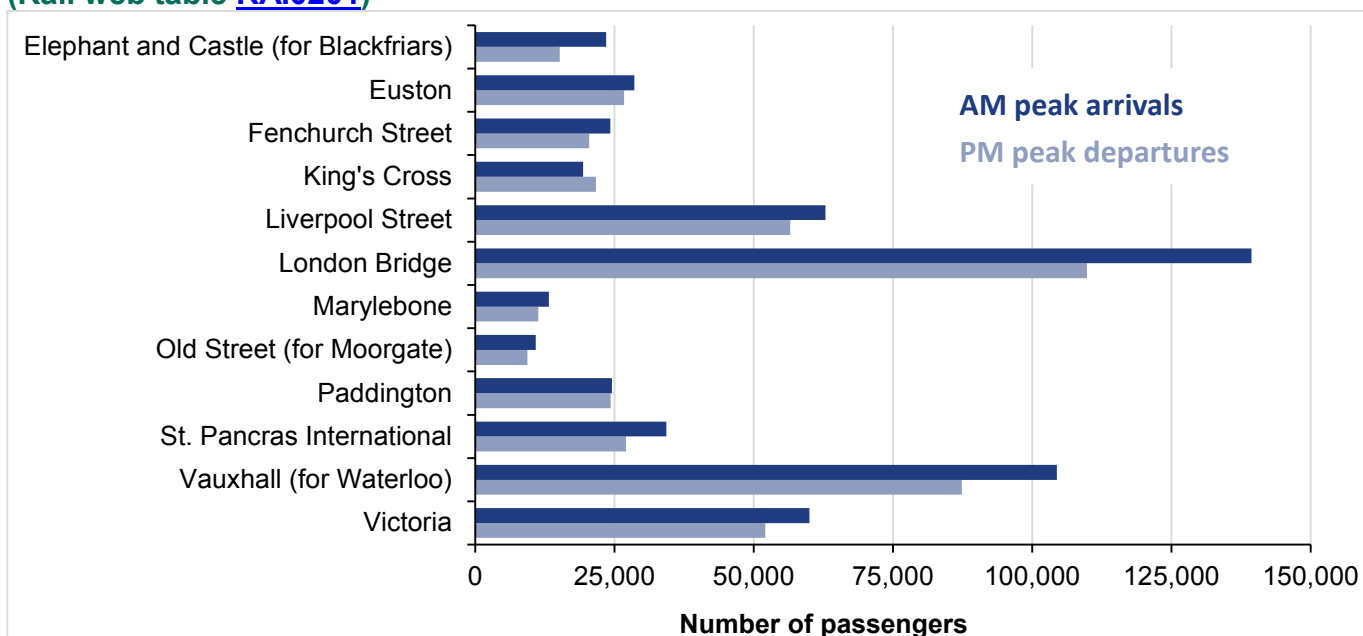
- Blackfriars had the highest crowding level of any terminal, rising from 4.6% PiXC in 2012 to 10.2% in 2013. This high level of crowding was seen on services from both operators at this station, with First Capital Connect higher at 12.4% and Southeastern at 8.3%. This increase in the level of crowding was not replicated in the afternoon peak where Blackfriars had a crowding level of 1.5% PiXC in 2013, only a slight increase on 2012 with 0.7%. Blackfriars also had the highest level of passengers standing, joint with Waterloo at 27.5% and closely followed by Fenchurch Street.

- King's Cross had a much lower level of PiXC and passengers standing than any other London terminal, a pattern which has been seen in each of the four years for which these statistics have been published. Marylebone also had low levels of passengers standing and saw a fall in PiXC and standing levels from 11.5% and 8.7% in 2012 to 6.9% and 3.5% respectively.

Passenger numbers in London

Chart 5 shows how the number of passengers arriving and departing from Zone 1 in London in the peaks varied by route on a typical weekday in autumn 2013. The stations listed are the stations on or closest to the Zone 1 boundary on each route.

Chart 5: Peak arrivals and departures by rail, by station: London Zone 1: 2013
(Rail web table [RAI0201](#))

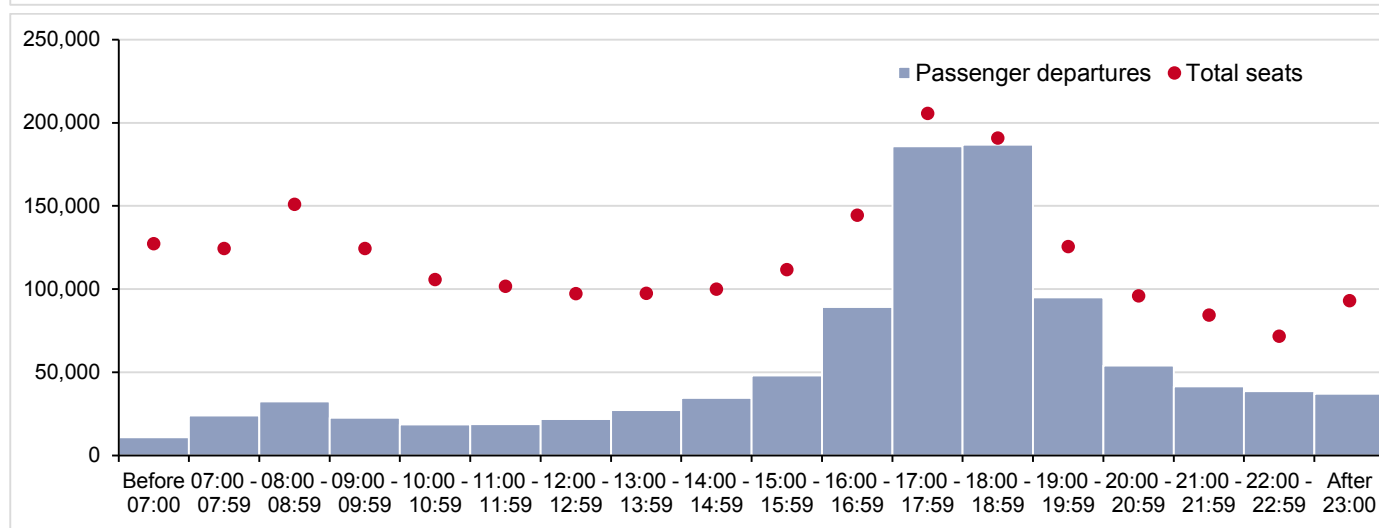
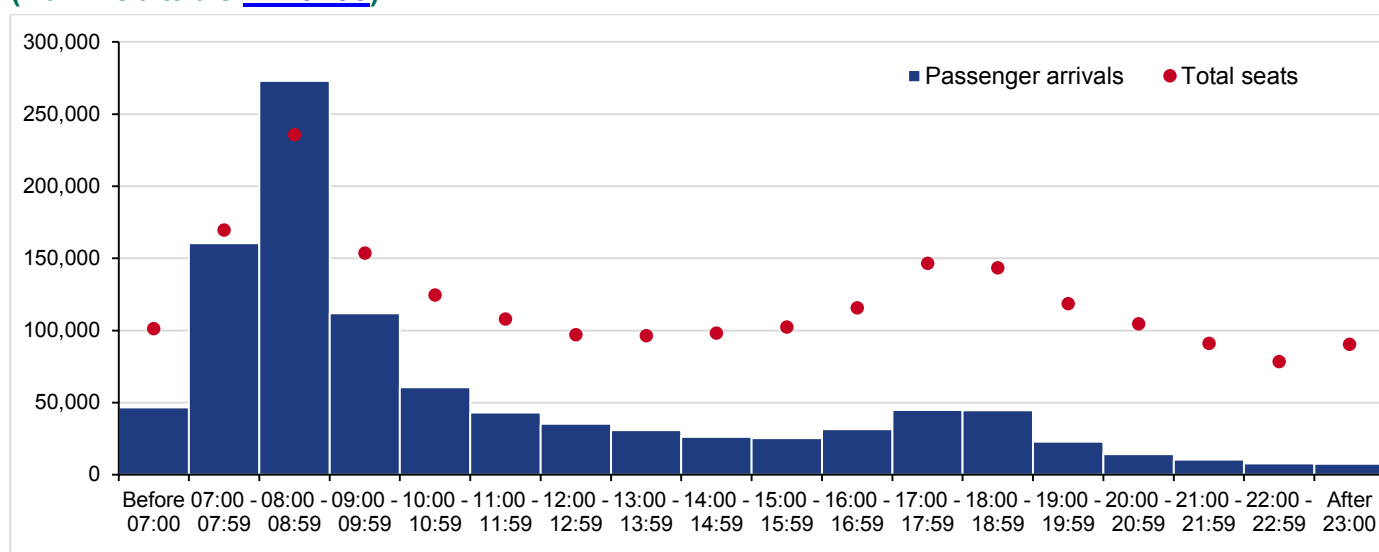


- In the morning peak, 139 thousand passengers were on trains entering Zone 1 at London Bridge, 25.6% of all peak arrivals into Zone 1. This total includes passengers who travelled through London Bridge to other stations, such as Charing Cross and Cannon Street. 23.8% of afternoon peak departures were on this route.
- At Vauxhall, 104 thousand passengers were on trains entering Zone 1 in the morning peak, 19.2% of all peak arrivals in London. This includes passengers travelling to Waterloo, including those on trains that did not stop at Vauxhall. 18.9% of afternoon peak departures were on this route.
- Between them, the routes into London Bridge, Vauxhall, Victoria and Liverpool Street accounted for over two-thirds of all morning peak arrivals and afternoon peak departures in London.

Passenger numbers in the morning peak were most concentrated in the hour from 08:00 to 08:59, with 273 thousand passengers arriving into central London in this time, half of the morning peak total and over a quarter of all arrivals across the day. The afternoon peak was more spread out, and a slightly higher number of people actually departed from Zone 1 in the first hour after the peak (19:00 to 19:59) than in the first hour of the peak (16:00 to 16:59).

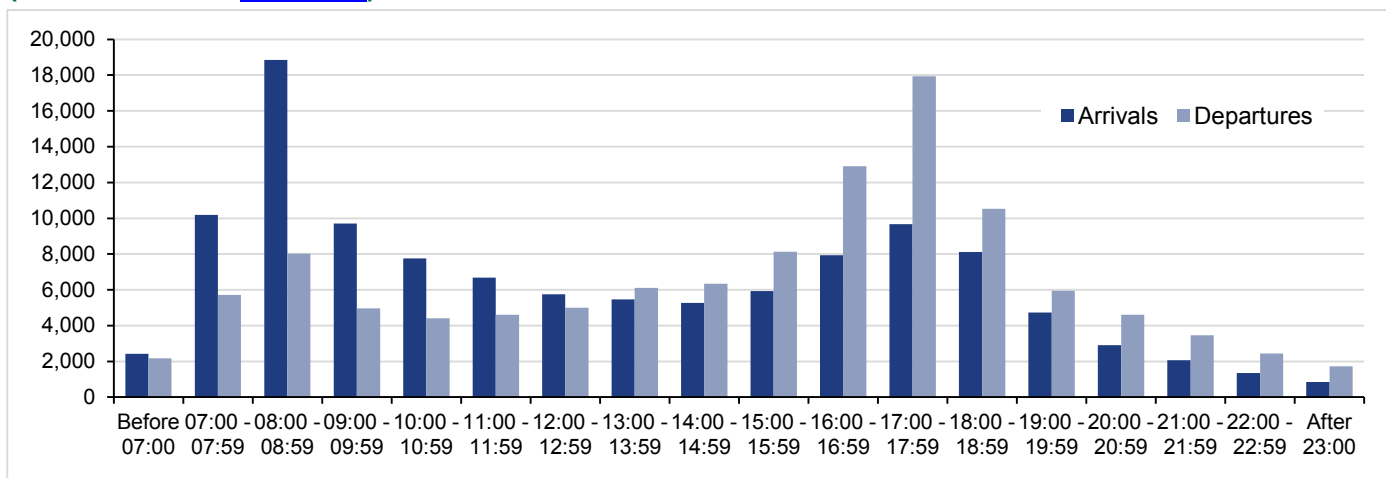
Charts 6 and 7 give an indication of how passenger numbers compared to the total seats provided throughout the day. As these are aggregate figures they hide a lot of detail, as there will be crowding on some routes and services while others have spare capacity. However, they do demonstrate how outside the peaks there is often a large amount of spare capacity, although this spare capacity will generally not be transferrable between routes or to other times of day.

Charts 6 & 7: Arrivals and departures by rail, by time band: London Zone 1: 2013
 (Rail web table [RAI0203](#))



Birmingham

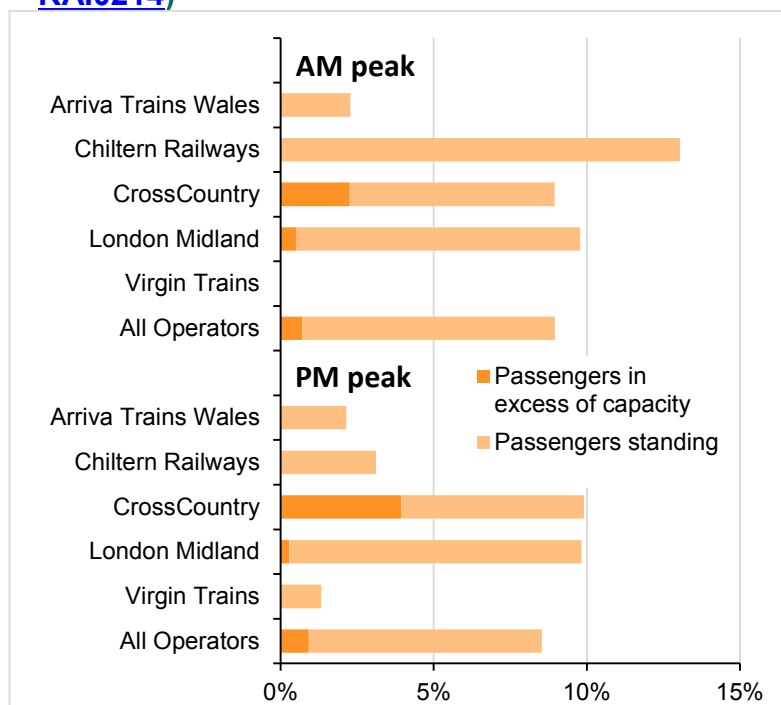
Chart 8: Arrivals and departures by rail, by time band: Birmingham: 2013
(Rail web table [RAI0202](#))



Five train operators operate services in Birmingham, with London Midland providing the majority of services on local commuter routes.

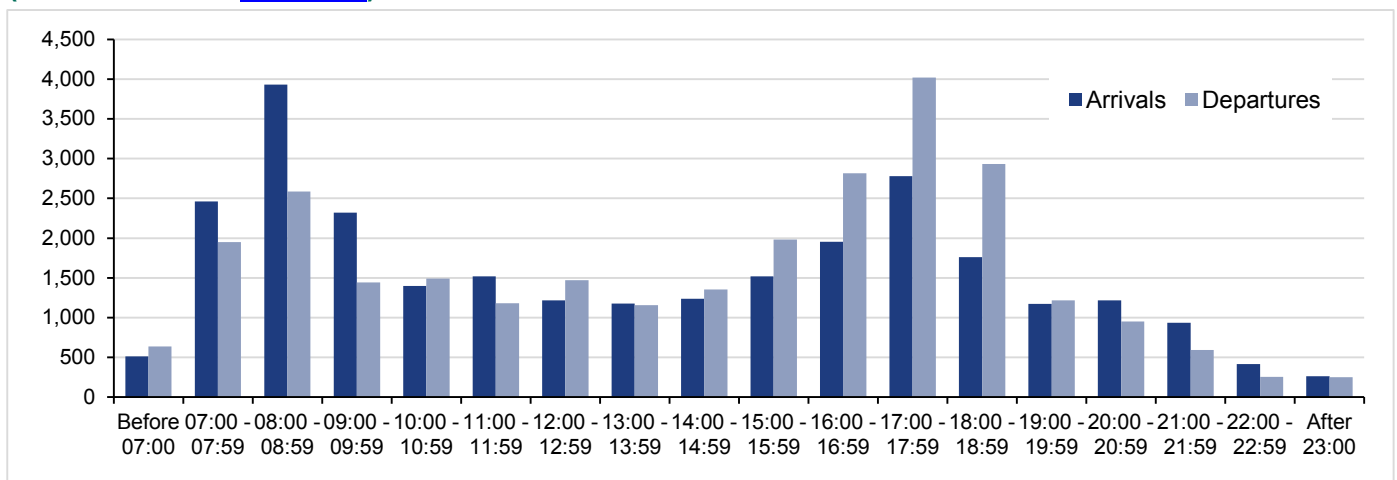
- On an average weekday 39 thousand passengers arrived into central Birmingham in the morning peak, the highest number for any city outside London. Across the day 116 thousand passengers were on services arriving into Birmingham. Passenger numbers have increased since 2012, when disruption on London Midland services during the autumn period led to reduced demand.
- At trains' busiest points 0.7% of passengers were in excess of capacity in the morning peak and 9.0% were standing in total. In the afternoon peak these figures were 0.9% and 8.5% respectively.
- The highest levels of crowding in both peaks were on CrossCountry services with 2.3% PiXC in the morning peak and 3.9% in the afternoon peak.
- 13.1% of passengers were standing on Chiltern services arriving into Birmingham Moor St and Snow Hill in the morning peak. However, just 3.1% were standing in the afternoon peak.

Chart 9: Passengers in excess of capacity by operator: Birmingham: 2013
(Rail web table [RAI0214](#))



Bristol

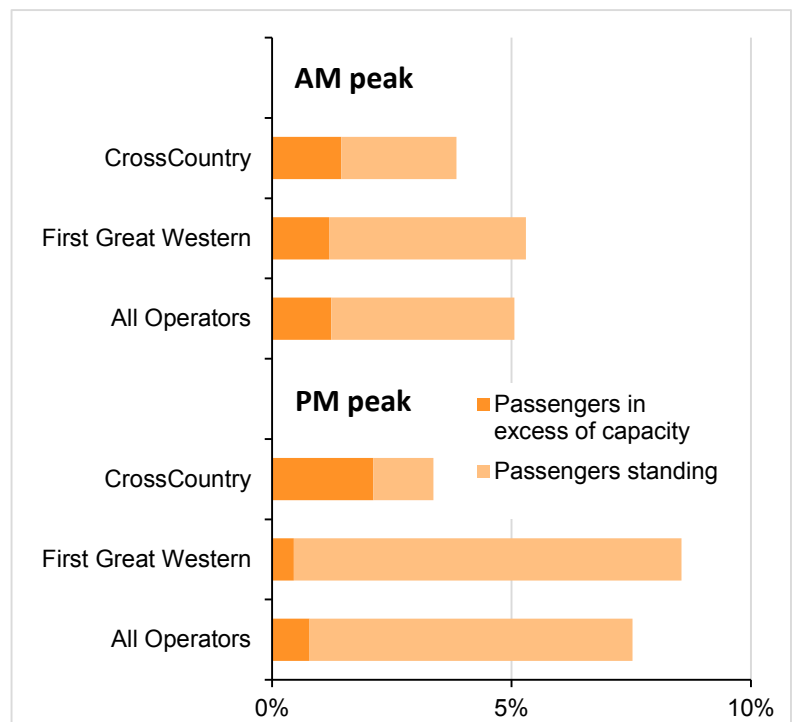
Chart 10: Arrivals and departures by rail, by time band: Bristol: 2013
(Rail web table [RAI0202](#))



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

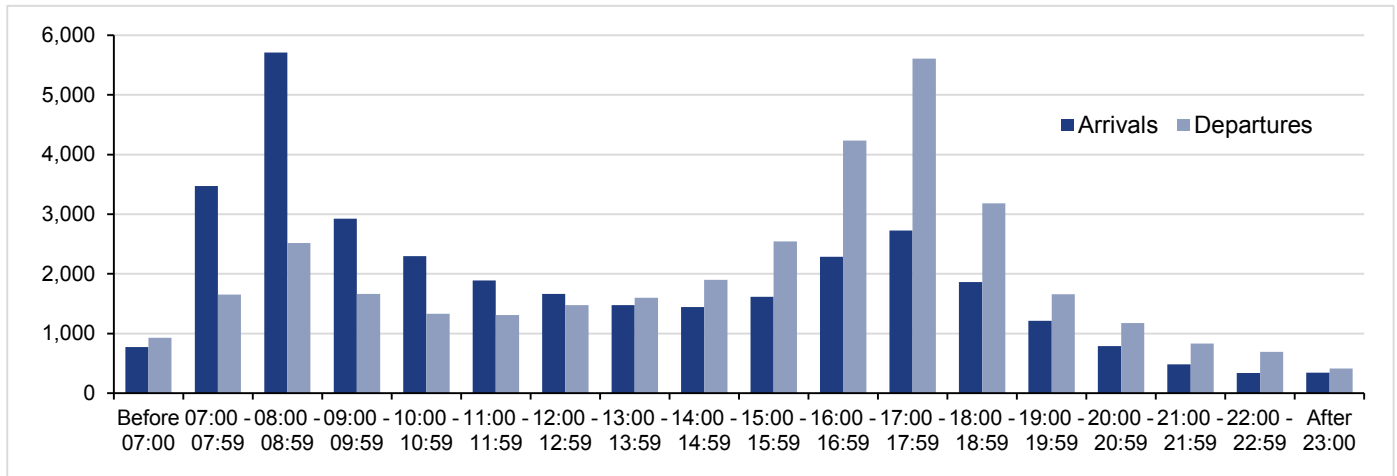
- On an average weekday 9 thousand passengers arrived into central Bristol in the morning peak. Across the day 28 thousand passengers were on services arriving into Bristol.
- At trains' busiest points 1.2% of passengers were in excess of capacity in the morning peak and 5.1% were standing in total. In the afternoon peak these figures were 0.8% and 7.5% respectively.
- The highest levels of crowding in both peaks were on CrossCountry services with 1.4% PiXC in the morning peak and 2.1% in the afternoon peak.
- 8.5% of passengers were standing on First Great Western services departing from Bristol Temple Meads in the afternoon peak, compared to 5.3% in the morning peak.

Chart 11: Passengers in excess of capacity by operator: Bristol: 2013 (Rail web table [RAI0214](#))



Cardiff

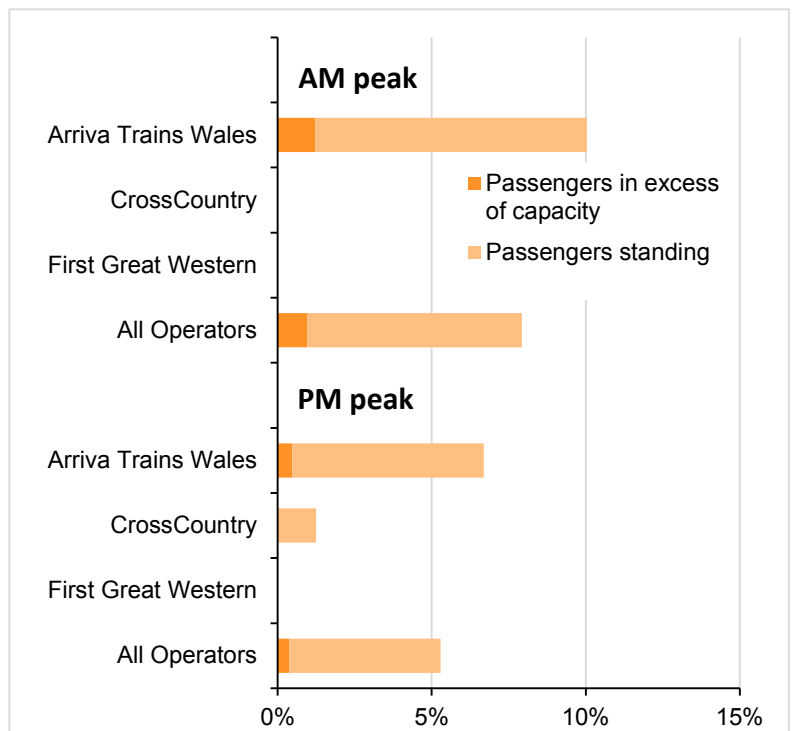
Chart 12: Arrivals and departures by rail, by time band: Cardiff: 2013
(Rail web table [RAI0202](#))



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

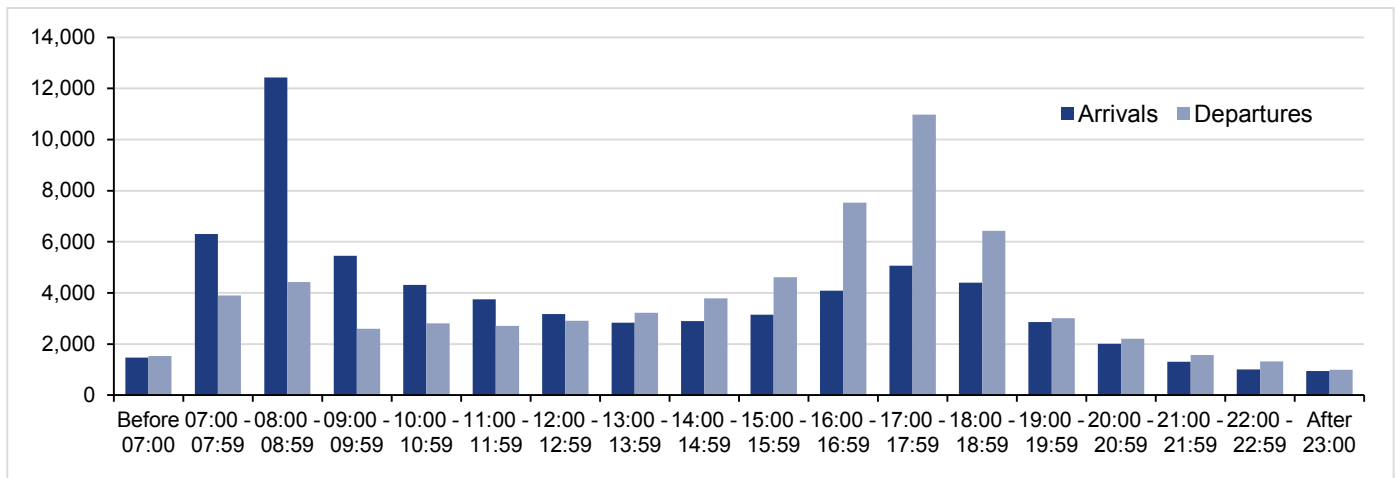
- On an average weekday 12 thousand passengers arrived into central Cardiff in the morning peak. Across the day 33 thousand passengers were on services arriving into Cardiff.
- At trains' busiest points 1.0% of passengers were in excess of capacity in the morning peak and 7.9% were standing in total. In the afternoon peak these figures were 0.4% and 5.3% respectively.
- The highest levels of crowding in both peaks were on Arriva Train Wales services with 1.2% PiXC in the morning peak and 0.5% in the afternoon peak.
- First Great Western had no passengers standing in either peak, and CrossCountry only had 1.2% of passengers standing in the afternoon peak, with no passengers standing in the morning.

Chart 13: Passengers in excess of capacity by operator: Cardiff: 2013 (Rail web table [RAI0214](#))



Leeds

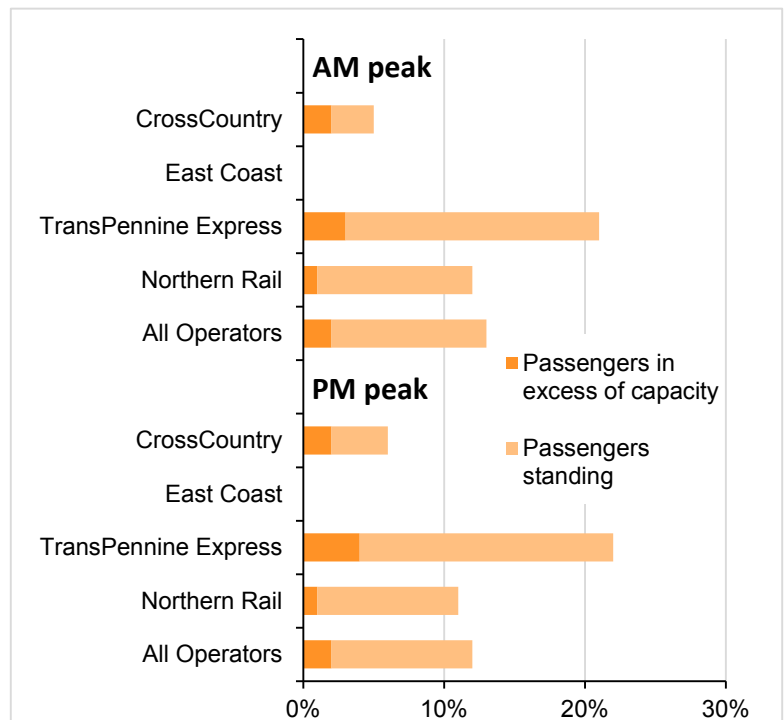
Chart 14: Arrivals and departures by rail, by time band: Leeds: 2013
(Rail web table [RAI0202](#))



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

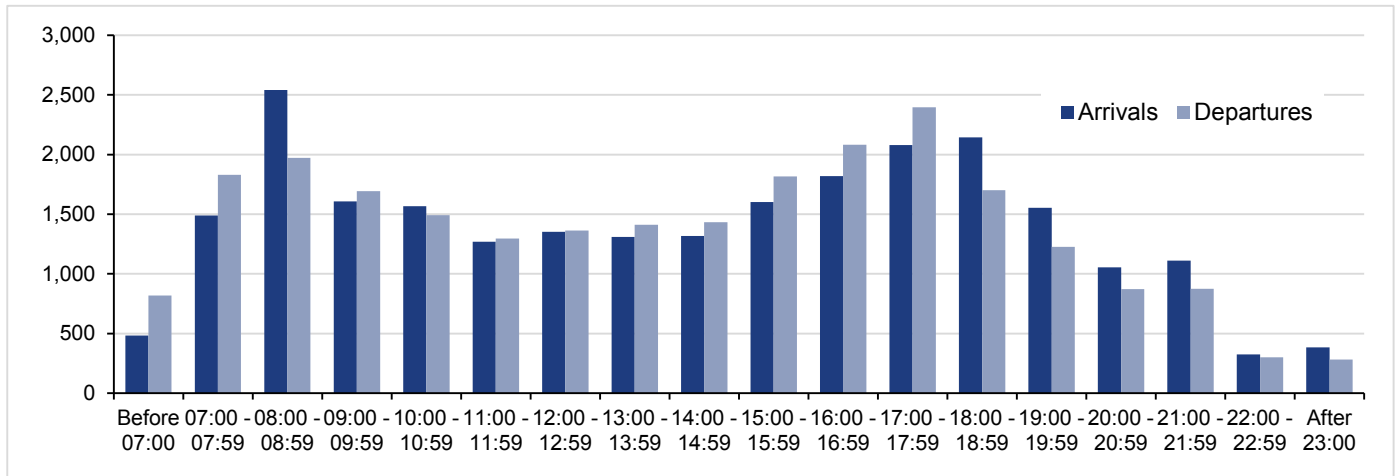
- On an average weekday 24 thousand passengers arrived into central Leeds in the morning peak. Across the day 67 thousand passengers were on services arriving into Leeds.
- At trains' busiest points 1.5% of passengers were in excess of capacity in the morning peak and 12.7% were standing in total. In the afternoon peak these figures were 1.6% and 12.0% respectively.
- The highest levels of crowding in both peaks were on TransPennine Express services with 3.3% PiXC in the morning peak and 4.1% in the afternoon peak.
- 20.9% of passengers were standing on TransPennine Express services arriving into Leeds in the morning peak and 21.7% in the afternoon peak.

Chart 15: Passengers in excess of capacity by operator: Leeds: 2013 (Rail web table [RAI0214](#))



Leicester

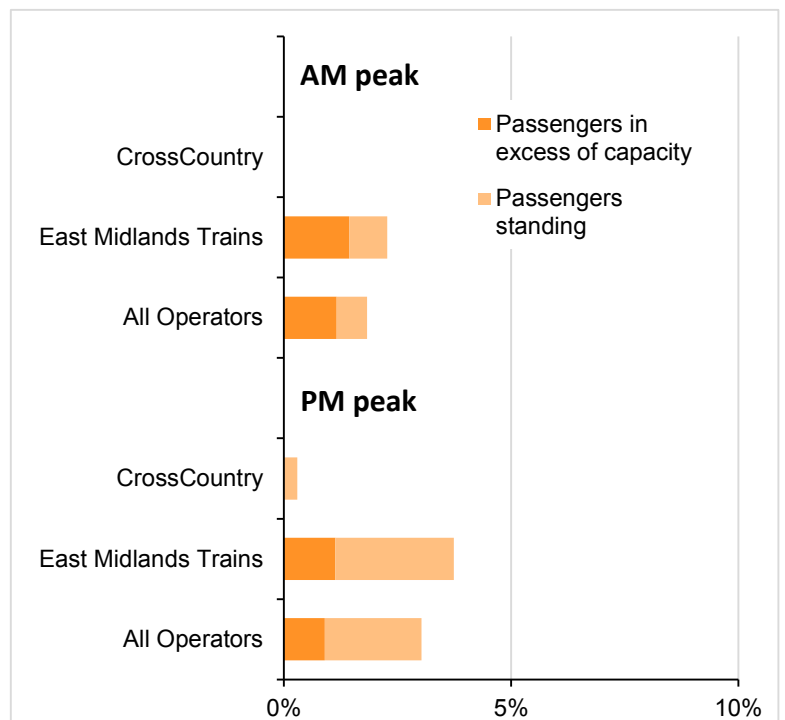
Chart 16: Arrivals and departures by rail, by time band: Leicester: 2013
(Rail web table [RAI0202](#))



Two train operators operate services in Leicester, with East Midlands Trains providing the majority of services on long distance routes. There were two peaks in the passenger numbers at Leicester during the day but demand was much more even across the day than seen in other cities.

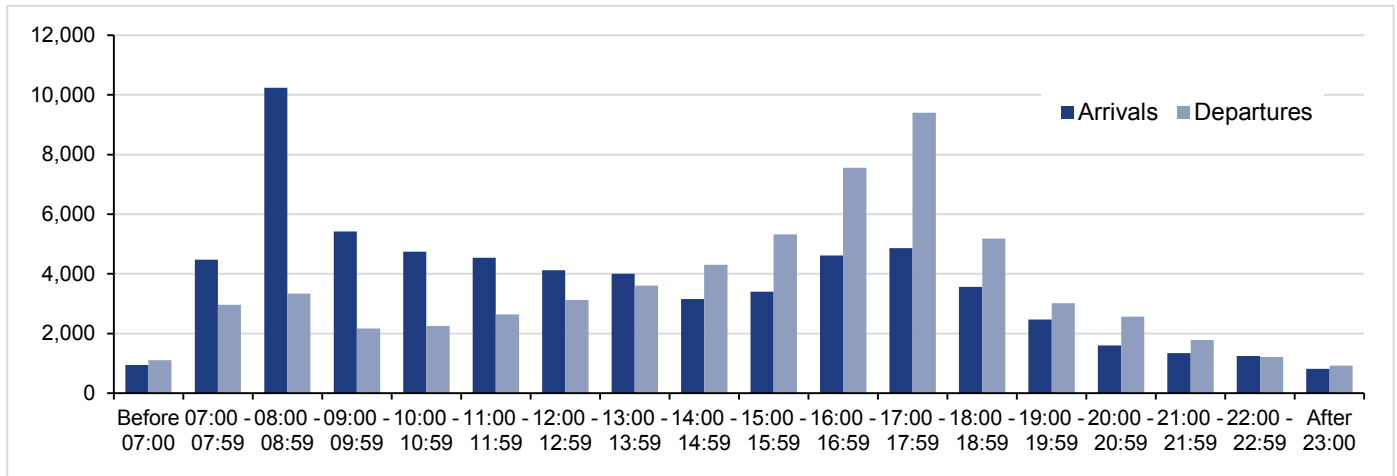
- On an average weekday 6 thousand passengers were on services arriving at Leicester in the morning peak. Across the day 25 thousand passengers were on services arriving into Leicester. These figures include passengers on trains passing through the city as well as those alighting there.
- At trains' busiest points 1.2% of passengers were in excess of capacity in the morning peak and 1.8% were standing in total. In the afternoon peak these figures were 0.9% and 3.0% respectively.
- The highest levels of crowding in both peaks were on East Midlands Trains services with 1.4% PiXC in the morning peak and 1.1% in the afternoon peak.
- East Midlands Trains services also had the highest percentage of passengers standing in both peaks with 2.3% and 3.7% respectively.

Chart 17: Passengers in excess of capacity by operator: Leicester: 2013 (Rail web table [RAI0214](#))



Liverpool

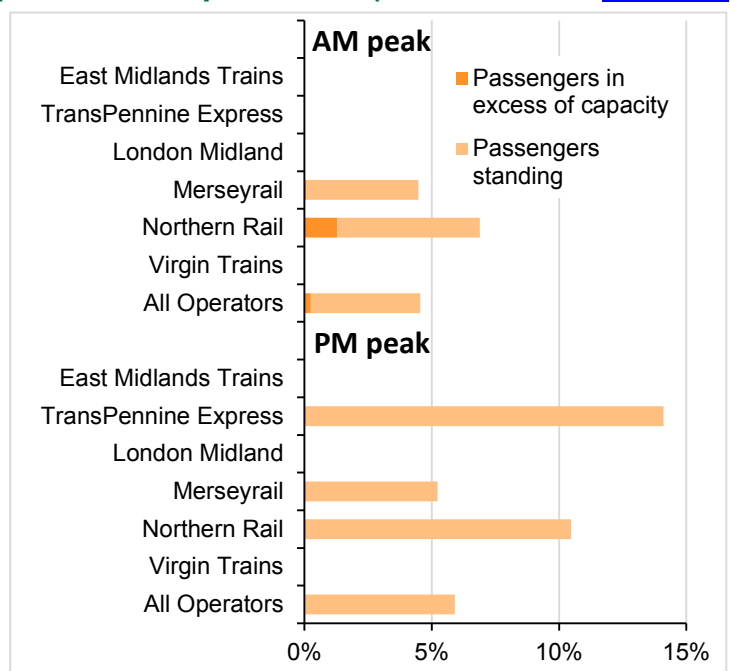
Chart 18: Arrivals and departures by rail, by time band: Liverpool: 2013
(Rail web table [RAI0202](#))



Six train operators operate services in Liverpool, with Merseyrail providing the majority of services on local routes. All other operators run services on routes into Liverpool Lime Street.

- On an average weekday 20 thousand passengers arrived into central Liverpool in the morning peak. Across the day 66 thousand passengers were on services arriving into Liverpool.
- At trains' busiest points 0.3% of passengers were in excess of capacity in the morning peak and 4.6% were standing in total. In the afternoon peak these figures were 0.0% and 5.9% respectively.
- The highest levels of crowding in the morning peak was on Northern Rail services with 1.3% PiXC in the morning peak. They had no PiXC in the afternoon peak.
- Merseyrail were the only operator to have crowding in both the peaks, however this was less than 0.1% PiXC in each of them.
- There was a higher percentage of passengers standing in the afternoon peak than the morning with 14.1% of First TransPennine Express passengers standing in the afternoon peak.

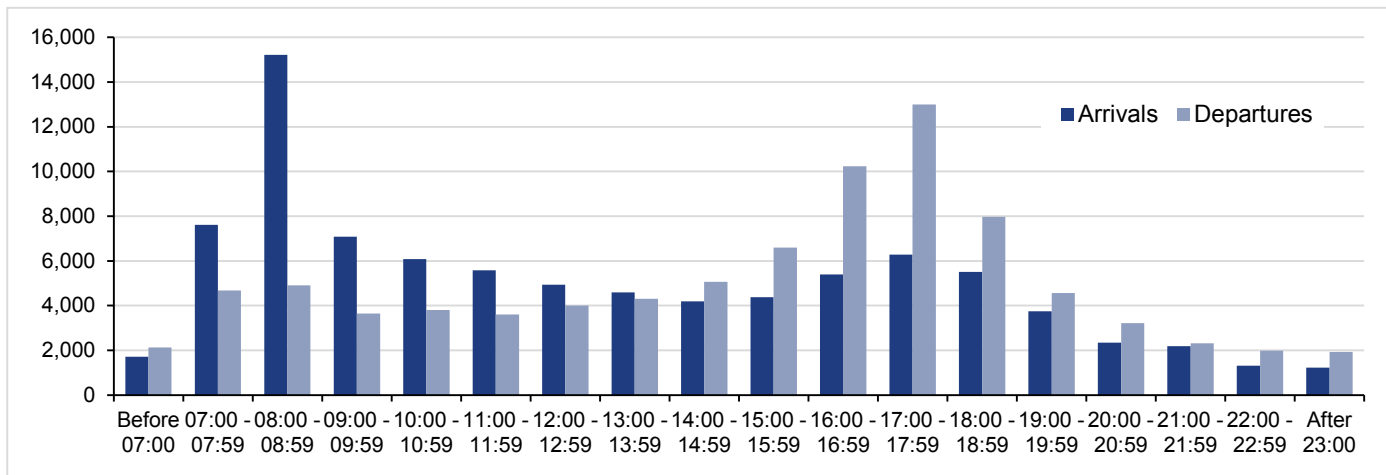
Chart 19: Passengers in excess of capacity by operator: Liverpool: 2013 (Rail web table [RAI0214](#))



* East Midlands Trains and Virgin Trains morning peak figures are not shown for confidentiality reasons.

Manchester

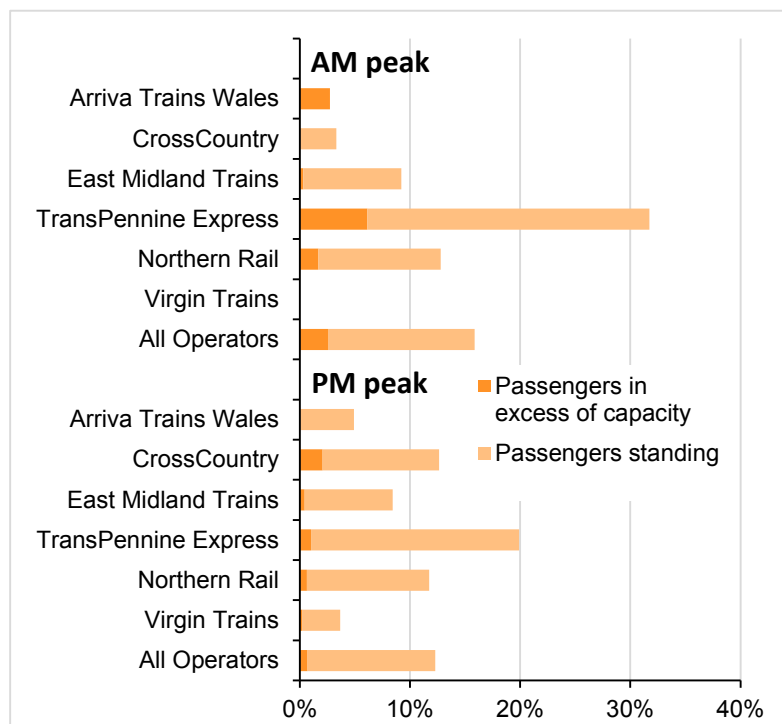
Chart 20: Arrivals and departures by rail, by time band: Manchester: 2013
(Rail web table [RAI0202](#))



Six train operators operate services in Manchester, with Northern Rail providing the majority of services.

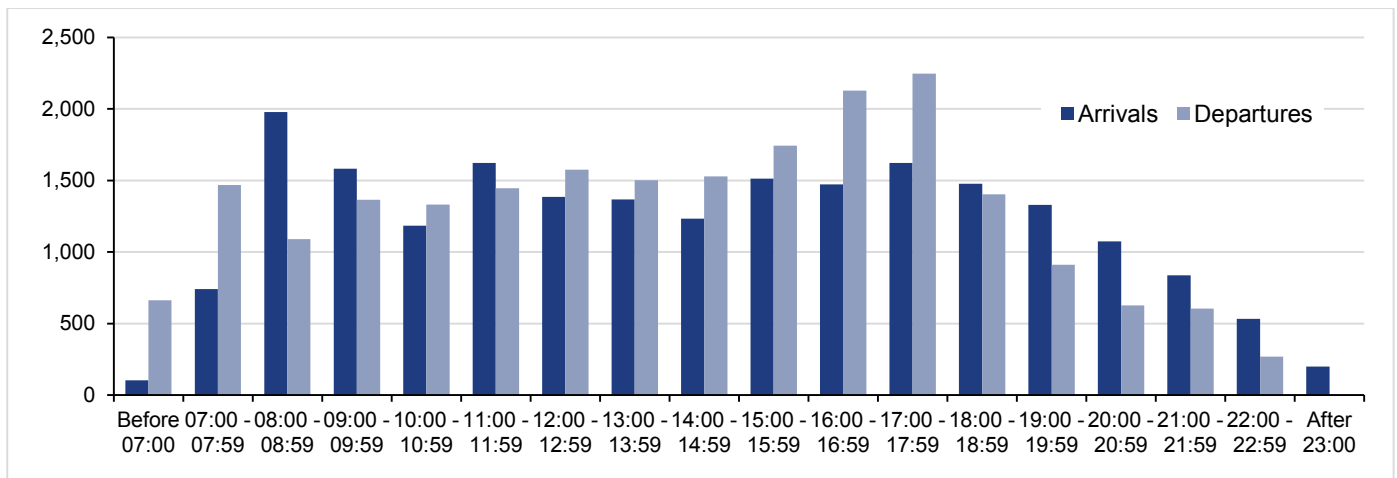
- On an average weekday 30 thousand passengers arrived into central Manchester in the morning peak, the second highest number for any city outside London. Across the day 89 thousand passengers were on services arriving into Manchester.
- At trains' busiest points 2.6% of passengers were in excess of capacity in the morning peak and 15.9% were standing in total. In the afternoon peak these figures were 0.7% and 12.3% respectively.
- The highest levels of crowding were in the morning peak, when Manchester had one of the highest PiXC levels for any city.
- First TransPennine Express had the highest level of crowding in the morning peak with 6.1% PiXC and 31.7% of passengers standing. It had 1.0% PiXC and 19.9% of passengers standing in the afternoon peak.

Chart 21: Passengers in excess of capacity by operator: Manchester: 2013 (Rail web table [RAI0214](#))



Newcastle

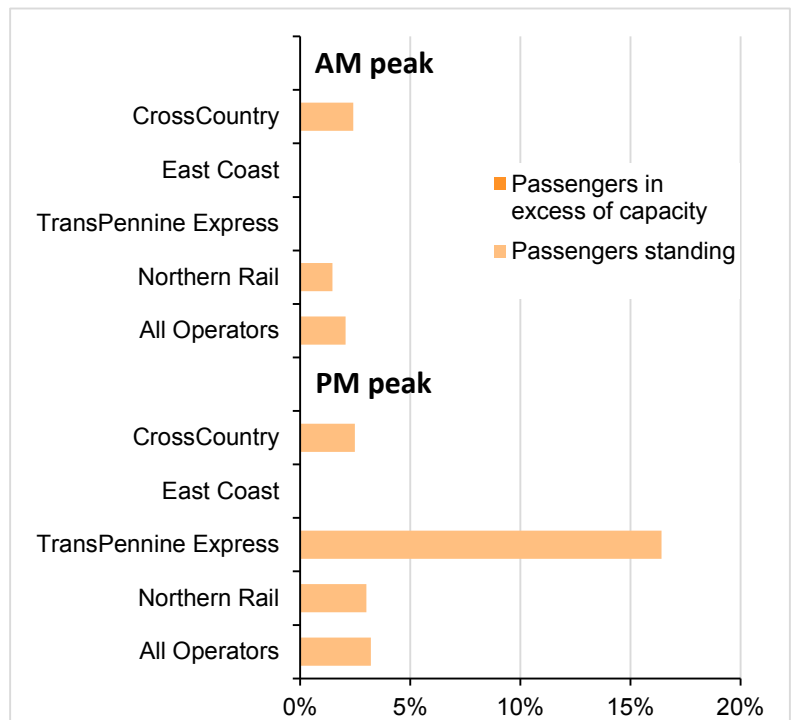
Chart 22: Arrivals and departures by rail, by time band: Newcastle: 2013
(Rail web table [RAI0202](#))



Four train operators operate services in Newcastle, with Northern Rail providing the most services on local routes. A large number of long distance East Coast and CrossCountry services also call at Newcastle.

- On an average weekday 4 thousand passengers arrived into central Newcastle in the morning peak, the second lowest number for any of the cities in these statistics. Across the day 21 thousand passengers were on services arriving into Newcastle.
- Passenger numbers are fairly constant through the day with only small peaks, the afternoon being more pronounced.
- There were no passengers in excess of capacity in either of the morning or afternoon peaks. 2.1% of passengers were standing in the morning peak and 3.2% in the afternoon peak.
- East Coast had no passengers standing in either the morning or the afternoon peak.

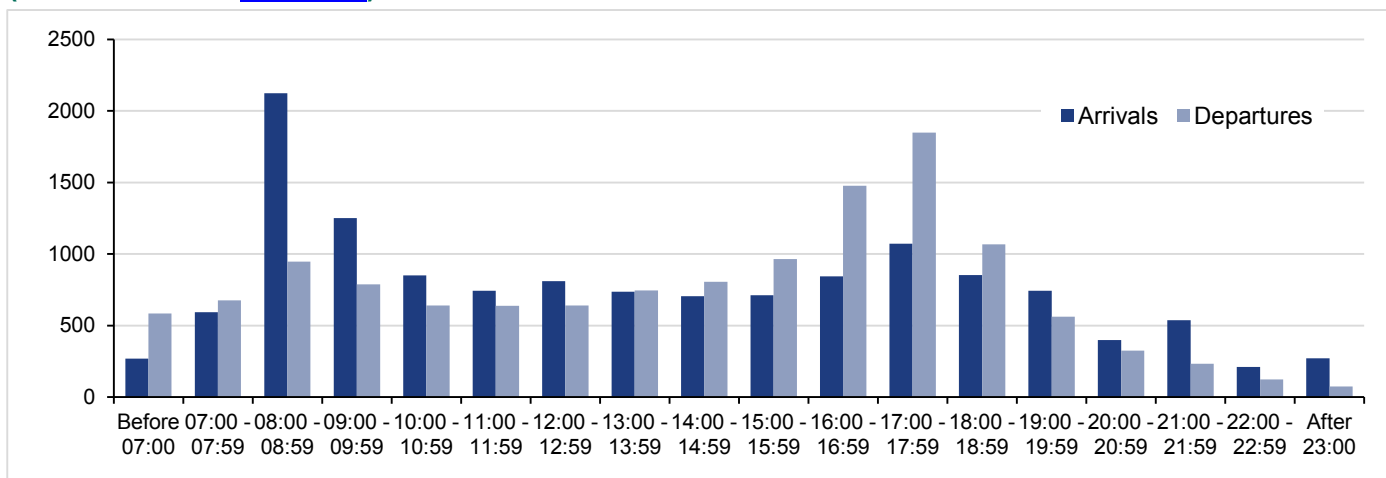
Chart 23: Passengers in excess of capacity by operator: Newcastle: 2013 (Rail web table [RAI0214](#))



* TransPennine Express morning peak figures are not shown for confidentiality reasons.

Nottingham

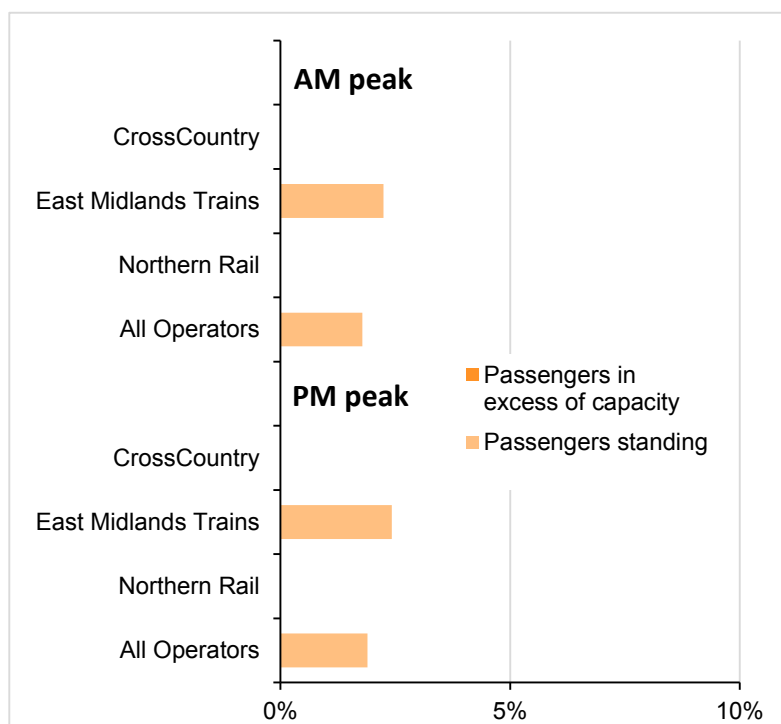
Chart 24: Arrivals and departures by rail, by time band: Nottingham: 2013
(Rail web table [RAI0202](#))



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

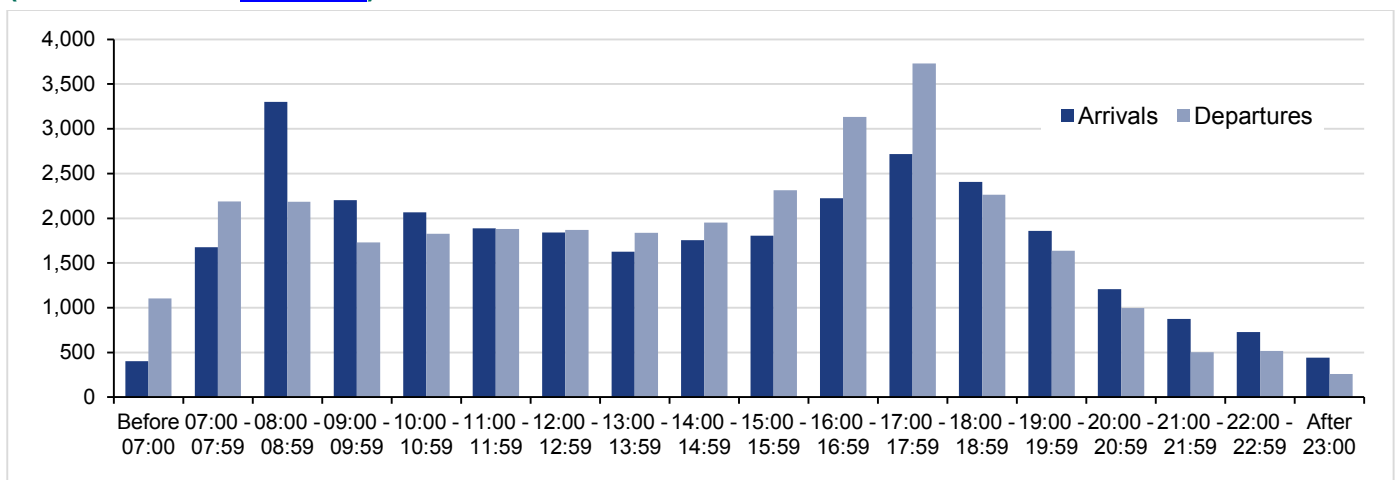
- On an average weekday 4 thousand passengers arrived into central Nottingham in the morning peak, the lowest number for any city counts were taken at. Across the day 14 thousand passengers were on services arriving into Nottingham.
- There are two clear peaks in passenger numbers through the day. The morning peak is shorter and more pronounced than the afternoon.
- There were no passengers in excess of capacity in either of the morning or afternoon peaks. 1.8% of passengers were standing in the morning peak and 1.9% in the afternoon peak.
- The only operator to have passengers standing on its services at Nottingham was East Midlands Trains, with 2.2% standing in the morning peak and 2.4% in the afternoon peak.

Chart 25: Passengers in excess of capacity by operator: Nottingham: 2013 (Rail web table [RAI0214](#))



Sheffield

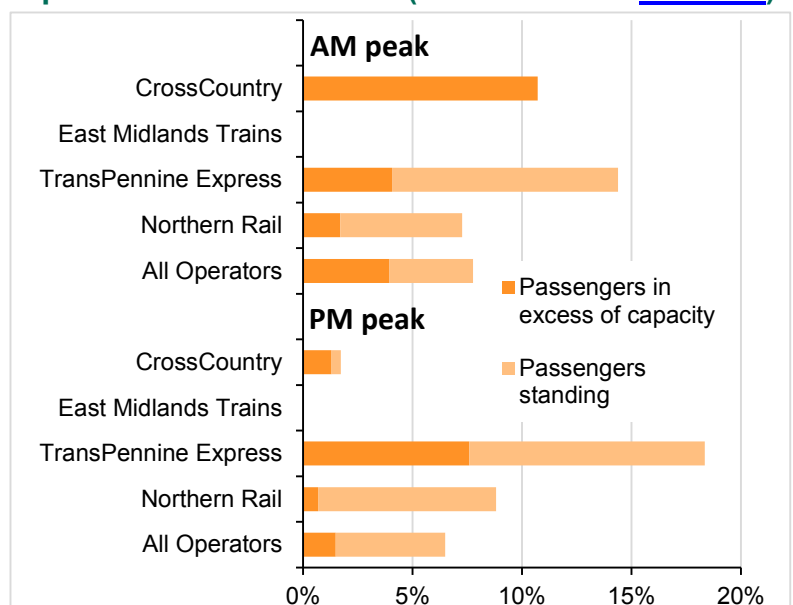
Chart 26: Arrivals and departures by rail, by time band: Sheffield: 2013
(Rail web table [RAI0202](#))



Four train operators provide services in Sheffield, with Northern Rail operating the majority of services.

- On an average weekday 7 thousand passengers arrived into central Sheffield in the morning peak. Across the day 31 thousand passengers were on services arriving into Sheffield.
- At trains' busiest points 4.0% of passengers were in excess of capacity in the morning peak and 7.8% were standing. In the afternoon peak these were 1.5% and 6.5% respectively. Sheffield had the highest peak PiXC level of any city in these statistics, although these PiXC were on just 15 services in total.
- The highest levels of crowding in the morning peak were on CrossCountry services with 10.7% PiXC. This figure dropped to 1.3% in the afternoon peak. These were predominantly passengers having to stand for more than 20 minutes between stations.
- The highest levels of crowding in the afternoon peak were on TransPennine Express services with 7.6% PiXC and 18.3% of passengers standing.

Chart 27: Passengers in excess of capacity by operator: Sheffield: 2013 (Rail web table [RAI0214](#))



3. 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, which can have an impact on the aggregate statistics, depending on the sample of days each year on which particular services are counted. This can have an impact on the aggregate statistics, particularly in cases where they 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 some 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.
- As the statistics are designed to represent a typical weekday during school term time in the autumn they will not necessarily be representative of passenger numbers and crowding at 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/230587/rail-notes-definitions.pdf

4. 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: 2013
RAI0202	City centre arrivals and departures by rail on a typical autumn weekday, by city and time band: 2013
RAI0203	Central London arrivals and departures by rail in on a typical autumn weekday, by station and time band: 2013

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: 2013
RAI0213	Peak rail capacity, standard class critical loads and crowding on a typical autumn weekday in London by terminal: 2013
RAI0214	Peak crowding on a typical autumn weekday by city and train operator: 2013
RAI0215	Peak crowding on a typical autumn weekday in London by terminal and train operator: 2013

5. 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 three 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, either by 'infra-red' or 'load weighing' equipment.
Autumn period	The period from mid-September to mid-December, excluding school half term.
City centre	One or more selected stations in the centre of the city. In London this includes all stations within Zone 1 of the Transport for London (TfL) travelcard area on routes into major terminals.
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. 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 three 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. These counts are either collected manually or by automatic counting equipment fitted to the train.
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. It is the difference between the standard class critical load and the standard class capacity, or zero if the critical load is within the capacity.
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. It is the difference between the standard class critical load and the number of standard class seats, or zero if the number of seats is greater than the passenger load.
Total seats	Includes all standard and first class seats on services when they arrive at or depart from the city centre.
Standard class capacity	Includes the number of standard class seats on the service and may include a standing allowance. No allowance for standing is made on a service when the time between stations before (AM) or after (PM) the critical load point is more than 20 minutes, but it is allowed when it is 20 minutes or less.
Standard class critical load	The number of standard class passengers on a service at the critical load point. It is the highest number of standard class passengers on a service on arrival at (AM peak) or on departure from (PM peak) a city.
'Typical' weekday	A midweek weekday during school term-time on which services are not disrupted and passenger numbers are not affected by any unusual events.

6. 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 tasks. 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 the feedback we have received from users in a recent 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.

7. Revisions

Several revisions have been made to the 2011 and 2012 statistics. In most cases they have a very small impact on the statistics overall. The main impacts of the revisions are as follows:

- In the 2011 statistics there have been small revisions to the numbers of seats and peak capacities in the Birmingham and London Euston data, and as a result to the London totals. The changes to the seating and capacity totals are very small, but they have also led to minor changes to the PiXC and passengers standing statistics for Virgin Trains and the city/terminal as a whole. Most notably for Virgin Trains the percentage of passengers standing and PiXC have both reduced from 1.7% to 0.5% in the PM peak at London Euston, and the percentage of passengers standing has increased from 0% to 1.0% in the AM peak at Birmingham.
- In the 2011 crowding statistics the Bristol standard class critical load has been reduced by 6% in the 3 hour PM peak and 5% in the 1 hour PM peak. As the number of passengers standing is unchanged this has led to the percentage of passengers standing increasing from 7.1% to 7.6% in the 3 hour peak and 7.4% to 7.7% in the 1 hour peak, and an increase in the First Great Western PM peak percentage standing from 8.2% to 8.9%.
- In the 2012 passenger number statistics there have been small increases to some of the passengers and total seats figures for arrivals into Leeds, Liverpool and Manchester, and for departures from Leeds and Manchester. All increases made at most a 0.6% difference to the totals for the whole day.

- There have been several revisions to the 2012 crowding statistics for Birmingham, Leeds, Liverpool, Manchester, and at London Bridge. The changes these make to the 3 hour peak PiXC and passengers standing statistics are summarised in the table below, and there have also been changes to the figures for some of the operators at these cities.

Table 2: Revisions to 2012 crowding statistics

	Original figures		Revised figures		Percentage point difference	
	PiXC	Passengers standing	PiXC	Passengers standing	PiXC	Passengers standing
AM peak						
Birmingham	0.5%	7.5%	0.5%	7.6%	unchanged	+0.1%
Leeds	2.2%	12.9%	2.2%	12.8%	-0.0%	-0.1%
Liverpool	0.2%	4.4%	0.2%	4.4%	-0.0%	-0.0%
Manchester	2.1%	11.1%	2.0%	11.8%	-0.0%	+0.7%
London Bridge	2.8%	23.0%	2.8%	22.9%	-0.0%	-0.2%
London total	4.1%	19.3%	4.1%	19.3%	-0.0%	-0.0%
PM peak						
Liverpool	0.2%	5.4%	0.2%	5.4%	Unchanged	+0.1%
Manchester	1.8%	12.1%	1.1%	12.1%	-0.7%	-0.1%

Note: differences of '0.0%' indicate a difference of less than 0.05 percentage points

8. 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 c2c services at London Liverpool Street and two Chiltern Railways services at London Paddington were excluded from the 2013 passenger number statistics, and one South West Trains service at Bristol was excluded from the crowding 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 2014 statistics published in July 2015.