

**House of Commons Transport Select Committee**  
**INQUIRY INTO OVERCROWDING ON PUBLIC TRANSPORT**  
**Evidence from the Passenger Transport Executive Group**

**Introduction**

1. The Passenger Transport Executive Group (PTEG) has substantial evidence of overcrowding on rail services within certain PTE areas causing significant hardship to passengers. PTEG believes that overcrowding on the heavy rail network is a result of a failure to plan for growth due to inadequacies in the franchise mechanism, poor operational performance, failures in the rolling stock leasing market and the lack of a clear rolling stock strategy.
2. The evidence below relates to recent experience of overcrowding on PTE rail services in England. It particularly relates to experiences in West Yorkshire, the West Midlands and Greater Manchester. Evidence is also provided relating to problems of overcrowding on the Manchester Metrolink light rail system.

**Background**

3. PTEG represents the 6 English PTEs and Strathclyde PTE in Scotland. The PTEs cover areas with a population of 13 million people. The GDP in the six English PTEs constitutes approximately 20% of the GDP for England. PTEs are responsible for the investment of large amounts of public money (during 2001/2 PTA/Es collectively were responsible for almost £1 billion of investment in transport) and the majority of this is in the form of indirect and direct subsidy support to the commercial bus and train operators. The PTE areas include the busiest stations and the most heavily used local rail services outside London. All PTEs are co-signatories to the appropriate local rail franchises in their area and, therefore, feel well placed to comment on the impact that overcrowding is having on the ability for rail to play a full role in an integrated transport strategy.
4. PTEs are committed to delivering high quality integrated transport networks for the conurbations they represent. Through investment in rolling stock, new stations and other improvements to the network, use of the local railways in conurbations has grown significantly. Furthermore, each PTE has in place Local Transport Plans and Rail Strategies for further developing their networks. These strategies recognise that if rail is to continue to play its part in an integrated transport network for the conurbations, the service offered must be of a significantly consistent high quality.

5. Market research indicates that one of the most important issues for passengers after reliability, punctuality and security/safety is overcrowding whether on longer distance or metropolitan services. Passengers in different areas do, however, have different tolerance levels depending on the nature of the rail services and the alternatives available. If PTEs are to make a contribution to national policy objectives (including the 50% growth target in the 10-year plan) and also meet their own Local Transport Plan objectives they need to ensure that rail is a real competitor with the private car in terms of frequency, journey times, comfort and ambience.

#### **Evidence of Overcrowding**

6. There is clear evidence of significant overcrowding on several PTE rail networks. In West Yorkshire, passengers have had to endure persistent overcrowding at peak times. On no single day since the start of the franchise in 1997 has all the planned peak capacity been provided. Since the start of the franchise the average achievement rate of planned peak train formations has been less than 80%. Put another way, a regular commuter can expect, on average, to experience a train formed of less than the booked number of carriages twice a week. Overcrowding is often of such a scale that passengers either cannot board trains or have to endure conditions so cramped that the journey is extremely unpleasant.

#### **Example 1**

The 06.52 York to Leeds via Harrogate train is a key commuter service into Leeds arriving at 08.20. The average number of passengers using this service in autumn 2002 was 245. The train is planned as a 3-car pacer unit with 195 seats meaning that the average load factor is 126%. Pacer units are unsuitable for commuter services as they have narrow bus-style seats and aisles reducing the availability of standing space.

Between the start of the winter 2002/03 timetable and the middle of December 2002, the train has only had its correct 3-car formation on 43% of occasions. That is to say on more than half the days in question the train operated as a 2-car train. In the majority of cases, the substitute unit was a 2-car sprinter with approximately 150 seats, which implies a load factor of 163%. On 7 occasions the train operated as a 2-car pacer, which implies a load factor of more than 200%, but in reality some West Yorkshire passengers would be unable to board the service.

7. Within the Centro area in the West Midlands, overcrowding is perceived to be a significant issue among many peak rail users, and it is not unusual for passengers to complain about not being able to board trains due to the severe overcrowding. One in six commuter journeys into Birmingham is made by rail, but increasing overcrowding will create a significant barrier to growing this proportion. Market research shows that most rail users have a car available for their journey, but choose to use the train. Unless rail users can be offered a comfortable service, including having a seat, then many will choose to drive, further congesting the road network. Under these circumstances, encouraging existing car users to transfer to rail becomes virtually impossible.

8. Within Greater Manchester, regular overcrowding on the heavy rail network occurs on the Bolton-Manchester, Greenfield-Manchester and Atherton lines at peak times. There are also overcrowding problems on the Metrolink light rail system and these are evidenced separately towards the end of this submission.

### **Causes of Overcrowding**

9. Overcrowding occurs on both a planned and unplanned basis. Planned overcrowding is a result of an inability to match the available rolling stock resources with passenger demand. Unplanned overcrowding results from a deviation from the planned train service and train formations on a day-to day basis. The main causes of overcrowding problems in PTE areas are:
  - Planned capacity is insufficient to meet demand;
  - Shortfalls in delivery of agreed capacity caused by:
    - a) A shortage of rolling stock;
    - b) Inadequate penalties for under-delivery;
    - c) Service disruptions;
    - d) A lack of resilience.

### **Capacity Planning**

10. Fundamentally the original franchises did not make adequate provision for passenger growth and the consequential need to provide additional capacity. In short, growth of the levels achieved in some PTE areas was either not envisaged or simply not properly planned for in the original franchises. Where growth has occurred, the franchise mechanisms have been unable to fully respond to it. For example, in West Yorkshire, peak patronage increased by over 40% in the first three years of the franchise and there was no corresponding increase in rolling stock capacity.
11. Capacity and overcrowding are measured through a capacity regime. Different regimes operate in PTE areas compared to those operated in the South East. There are several reasons why different overcrowding standards need to be applied in PTE areas:
  - Rail demand outside London and the South East is still relatively elastic. The conditions on the highway networks, although congested, are not as severe as in London. If rail is to effectively compete with rail car drivers need a reasonable expectation of a seat and personal space. If their experience of rail is unfavourable, they will switch back to car;
  - Much of the rolling stock deployed in PTE areas is unsuitable for carrying high volume peak commuter flows. In some areas, a large number of services are still provided by pacer and sprinter units. Pacers with their few external doors and narrow seats and aisles cannot physically accommodate large volumes of standing passengers. Most sprinters were designed for longer distance flows with 2+2 seats and doors at each end of the vehicles again not suitable for high volume commuter flows with large numbers of passengers attempting to board in a short space of time;

- Many PTE services are operated by an intricate mix of rolling stock types (for example in West Yorkshire there are 10 different unit types all with varying capacities). Train operators and PTEs have developed train plans that optimise the use of scarce rolling stock resources by matching train loadings as closely as possible to unit types which are often deployed in combination. The result is often a train plan that is not robust enough to consistently deliver the planned capacity as perturbations (for example due to unit breakdowns) cause the substitution of a lower capacity unit and the inevitable overcrowding. In the West Midlands, electric services are limited to either 3 or 6 car formations which means that where a 4 car train is required either an overcrowded 3 car, or underused 6 car train has to be planned;
  - Peak loadings can vary significantly from day-to-day and therefore on any given day actual loadings and overcrowding can be significantly higher than the train plan suggests.
  - PTEs need to be able to offer a consistently high quality rail service in order to meet Local Transport Plan objectives and to support regional economies.
12. In West Yorkshire, planned capacity is measured through the Passengers In Excess of Capacity (PIXC) measure defined in the Franchise Agreement. PIXC is an aggregate measure of the proportion of passengers travelling in the peak period in excess of the number of seats provided on each train. The Franchise Agreement states that PIXC for West Yorkshire should be no more than 4.0% in the morning and evening peak periods.
  13. At present PIXC in West Yorkshire is 9.0% in the morning peak (more than double the permitted level in the Franchise Agreement) and 5.3% in the evening peak (lower because it covers a longer time period). This means that there are a significant number of overcrowded trains even when the service operates correctly.
  14. Within the Central Trains franchise, Central Trains is required to deploy up to 112 vehicles on PTE sponsored rail services. The franchise as written requires that:
    - a. Passengers shall not be required to stand on trains for more than 15 minutes during peak periods and not at all at any other time.
    - b. To the extent that passengers are obliged to stand during peak periods the number standing shall exceed the seating capacity of the train by no more than an average of 10 per cent on Weekdays, provided that the number standing shall exceed the seating capacity of any individual train by no more than 35 per cent on any individual service on any day.
  15. In the West Midlands, overcrowding is monitored on an individual train-by-train basis rather than the aggregate PIXC approach used elsewhere. Passenger counts are regularly undertaken on all peak trains. If a train has, on average, a load of more than 110% of its seating capacity, then the train operator is required to provide additional capacity.

16. The obligation on the train operator to meet the overcrowding standards in the Franchise Agreement only extends up to a specified number of vehicles. In the West Yorkshire this cap was actually reached from day one of the franchise. Therefore there has been no obligation whatsoever on the franchise operator to fund additional vehicles during the course of the franchise. This inadequacy in the franchise has been the fundamental cause of overcrowding problems experienced in West Yorkshire.
17. In the West Midlands, the rolling stock cap was reached a couple of years ago, but overcrowding has been kept within the 110% limit until this year (in part due to other longer-distance operators being able to carry significant volumes of commuters). The current position is that unless a way of funding additional rolling stock is found, passengers will have to suffer conditions worse than envisaged in the franchise agreement.
18. PTEG believes that the SRA should fund rolling stock to meet capacity standards through the franchise mechanism. Due to the failure of this process some PTEs have developed Rail Passenger Partnership (RPP) bids on a piecemeal basis to try and bridge the gap. In Greater Manchester, funding was made available to retain some pacer units that were due to go 'off lease', but the impact has been negated by problems in introducing new rolling stock.
19. Metro has sought and received RPP funding totalling £6.3m for additional rolling stock in West Yorkshire. Bids have been prepared at considerable cost to Metro, but it was the only mechanism available to fund additional capacity that was desperately needed. To date an additional 13 diesel vehicles and 16 new electric vehicles have been funded for use in West Yorkshire through this mechanism. The impact of the additional diesel vehicles has been reduced by an underlying shortfall of rolling stock in the franchise. The additional electric vehicles have allowed half of the fleet of new Class 333 units to be strengthened to 4-car units. The remainder of the fleet will be converted in 2003.
20. The result of additional rolling stock provided through the RPP mechanism has assisted in reducing the growth in overcrowding, but not solved the problem per se. As noted above, PIXC in West Yorkshire is still twice the permitted limit in the morning peak and this does not take any account of the day-to-day shortfalls in the provision of planned capacity.

### **Shortfalls in the Delivery of Planned Capacity**

21. Shortfalls in planned capacity are compounded by failures to deliver on the day where train operators are unable to provide the planned capacity.

#### Shortage of rolling stock

22. The main cause of unplanned overcrowding in West Yorkshire is a fundamental shortage of rolling stock to operate the services. In February 2001, the Arriva Trains Northern (ATN) franchise was extended for a period of 2 years and as part of the contract, an underlying shortfall of 18 vehicles (9 x 2-car units) was identified. The shortfall manifests itself most often in short-formed peak trains.

23. To date, 4 additional vehicles (2 x 2-car units) have been sourced by ATN (and funded by the SRA), but this still leaves an underlying shortfall of 14 vehicles for which there is no readily identifiable source. Even if they could be sourced, the SRA has indicated that its current budgetary position means that it would be unable to fund them.
24. There is currently a national shortage of rolling stock with no readily available rolling stock that can be drafted in to meet shortfalls in specific areas. The only real solution is new build, but the long lead times and incompatibility with existing rolling stock often rules this out as a short term option.
25. The timescales associated with procuring additional rolling stock are also an issue as suitable spare rolling stock does not currently exist. The lack of a national rolling stock strategy means that re-allocation of rolling stock between franchises to meet particular shortfalls is difficult (except between franchises with the same parent operating group).

#### Economics of rolling stock

26. The difficulty with procuring additional rolling stock is the costs involved which create a significant ongoing need for subsidy. The basic economics are that it costs about £150,000 per year to lease, maintain and operate each vehicle. Given that there is plenty of spare capacity off-peak, this cost effectively has to be justified on the basis of one morning and evening peak journey. The maximum income that a single peak round trip is likely to generate would be around £50,000 assuming a full and standing load. Therefore every additional peak vehicle needed to reduce overcrowding would generate a subsidy requirement of £100,000 per annum. This is a significant difference from the South East where longer journeys mean that passengers pay more per journey and thus the direct lease and operational costs can often be covered. Under this scenario PTEs are very concerned that London and the South East will be seen as better value for money for investment in rolling stock, and reducing overcrowding in PTE areas could be considered unaffordable by the SRA.
27. The high cost and unavailability of rolling stock is a clear indication of market failure that the Rolling Stock Leasing Companies have failed to address. The few 'speculative' orders placed for rolling stock have in fact quickly filled existing gaps. There is also no short-term leasing market for the type of rolling stock that could be readily deployed on commuter services.
28. Rolling stock leasing companies are generally seeking lease lengths beyond the end of franchises in order to reduce uncertainty (and consequential risk pricing). This is particularly problematic for franchises that are close to their renewal dates (or in the case of Arriva Trains Northern about to enter an 'interim' 2-year franchise period). The rolling stock leasing companies are risk averse and the SRA is reluctant to provide the necessary ongoing commitments indicating a failure of the rolling stock market. Shorter franchise lengths could exacerbate this problem.

### Incentive Regime

29. Where PTEs have a capacity regime in place, shortfalls in agreed capacity are measured through the Short Formation Incentive Payment (SFIP) regime. Each peak train contained within the train plan has a capacity based on the number of seats to be provided. Any deviation from this is recorded as an SFIP failure and a penalty is levied based on the difference between the actual and planned number of seats provided.
30. SFIP penalty payments are related to the main Performance Incentive Regime (and must continue to be so in order to prevent perverse incentives to cancel a train rather than short-form it). However, the penalties do not currently relate avoidable cost of leasing an additional unit of rolling stock. The West Yorkshire example below indicates that there could be an incentive to short-form rather than lease additional rolling stock (where there is an underlying short fall such as in West Yorkshire).

#### **Example 2**

The 07.15 Sheffield to Leeds service forms a key commuter service into Leeds arriving at 08.30 carrying an average of 290 passengers. The train is booked to operate as 2 pacer units coupled together which would provide 243 seats implying that 47 passengers would have to stand. Since the start of the winter 2002/03 timetable the train has only operated with the booked capacity on 55% of occasions. The other 45% of occasions it has generally operated as a single 2-car unit implying a load factor of up to 240%.

The SFIP penalty for such a failure is in the order of £200 per day or £50,000 p.a. This can be compared with the annual lease cost of an additional 2-car unit of at least £200,000 p.a. (excluding maintenance and staff cost).

31. In West Yorkshire, the SFIP regime does not apply to some of the busiest commuter routes (including Harrogate to Leeds and TransPennine services between Huddersfield and Leeds) and therefore no penalties are payable for short-formations. Some of these routes have some of the worst records of short formations and overcrowding. On the TransPennine route for example one morning service between Huddersfield and Leeds loads to 184% of seating capacity and is regularly formed of less than the booked number of carriages.

### Service Disruptions

32. Service unreliability is also a significant cause of overcrowding. Recent exceptionally poor performance in the West Midlands has meant that overcrowding is a frequent occurrence across the network and is the single largest cause of overcrowding. Overcrowding occurs when, for example, the cancellation of a train results in a double load on the next one, or late running means that some of the load of the next train is picked up.

33. Overcrowding can be both the cause and the effect of late running. A shortformed train that is seriously overcrowded will spend longer in stations while passengers board and alight, and thus it will run late. On a high frequency local service, any late running will mean that it will pick up passengers arriving for the next train, resulting in further overcrowding and late running.
34. Problems such as this are a particular problem in the morning for passengers trying to catch trains from stations closer to the city centre, as by the time the train reaches them they are often unable to board.

#### Lack of Resilience

35. The original franchises were let on the basis of a reducing cost base. This led to operators making efficiency savings or alternatively working existing resources more intensively. In many cases assets have been worked too hard and there is no resilience left in the system.
36. The current peak train plans rely on very tight resource diagrams in order to maximise the usage of rolling stock. However, this means that the timetable is very tight and prone to delay. Building more slack and turn-round allowance into unit diagrams would have performance benefits, but would result in greater overcrowding as less efficient use of the rolling stock is being made. There is therefore a trade-off between performance, overcrowding levels and costs.
37. In West Yorkshire, there are also specific examples of staffing levels being reduced, which has had a direct impact on overcrowding. For example, staffing levels were reduced in the Service Delivery Centre (by the original franchisee, MTL) such that controllers were unable to sufficiently focus on allocating the correct unit to each diagram, particularly during 'out of course' running when the focus is necessarily on keeping the service going. Staffing has since been increased again by Arriva Trains Northern, but this serves to illustrate the false economies of staff reductions.

#### **Other Issues**

38. Another issue which impacts on overcrowding is the fact that new or refurbished trains now have to comply with the Rail Vehicle Accessibility Regulations. In order to make the trains more accessible for disabled people, seating capacity is inevitably reduced. Thus if an existing fleet of trains is refurbished, there will be less capacity than before and either more vehicles would be needed, or greater standing would have to be tolerated.
39. Many PTE routes are shared with other operators. By planning jointly with other operators, good use of overall rolling stock can be made. However, if another operator changes the times of their trains, then this can significantly alter the loading of the PTE services in a way that may not be manageable. Depending on other operators to carry local passengers also means that it is not possible to impose the PTE loading standards on these services.

40. For example, one of the most overcrowded services in the West Midlands is Chiltern Railways 1710 Birmingham Snow Hill to Marylebone service which has an approximate 170% load factor, however Chiltern consider that tackling overcrowding in the London area is a higher priority than putting extra vehicles on this service. Between Coventry, Birmingham and Wolverhampton, Centro is largely reliant on Virgin Trains to carry many of the local passengers, and their recent upgrade to Voyager rolling stock has created significant difficulties due to the severe overcrowding on their services.

### **Light Rail – Experiences on Manchester Metrolink**

41. Increased patronage of the Metrolink network has resulted in parts of the system suffering from temporary overcrowding, in particular during peak times and before/after major public events. The success of the Metrolink system in moving large numbers of people quickly and safely is well proven. During the recent Commonwealth Games an estimated 80% of all visitors used public transport in preference to car to access the events.
42. There are currently 32 trams in total in the Metrolink Fleet and three services are planned to operate as double trams in the morning peak. The current operator of the Metrolink system has been unable to consistently meet the timetabled requirement for trams in daily service due to a higher than expected level of faults and failures. This has at times randomly increased the levels of overcrowding experienced.
43. GMPTE is working closely with the existing Metrolink Concessionaire and shortlisted bidders for the Phase 3 extension to address both the immediate requirement to remove overcrowding and to ensure that the system will provide sufficient capacity for the expected future patronage growth.
44. To address immediate overcrowding, GMPTE has supported the current operator in providing increased peak fleet availability by moving tram maintenance to night times. It is also sponsoring the resolution of all latent defects in the trams including a major overhaul of the 26 vehicles in the Phase 1 fleet. GMPTE is currently investigating the opportunity to procure up to 13 additional trams, which are expected to become available shortly in Germany. These would be funded by a grant of £6m from the DfT, which has already been approved in principle. The second-hand trams will provide a vital stop-gap before new trams are built and commissioned on to the Phase 3 network.
45. GMPTE believes that the current demand to use the system is partially suppressed by the overcrowding and that the new journey opportunities and system quality will substantially increase patronage. It has, therefore, set out clear requirements to the bidders for the Phase 3 concession to provide sufficient vehicles for the expected increase in patronage of the existing system as well as the new extensions for the next 20 years. GMPTE is delighted that the DfT has endorsed this strategy within the £520m of funding approved for the Phase 3 expansion.

## Conclusions and Recommendations

46. PTE areas have witnessed some significant growth in heavy rail patronage and rail is a vital element of their integrated transport systems. Growth has not, in general, been accompanied by any significant investment in rolling stock. This coupled with poor service delivery has led to significant overcrowding problems (to the extent of passengers frequently being unable to board trains). If the problem continues, the growth is likely to stagnate and targets are unlikely to be met.
47. Many trains in PTE areas currently operate as 2, 3 or 4 car formations as standard. Most peak trains do not operate at their maximum length and there is therefore considerable scope to lengthen trains in peak periods to provide additional capacity. In some cases, platforms need to be lengthened, but this can be undertaken at considerably less expense than the massive infrastructure schemes that are necessary to provide additional capacity in the South East.
48. PTEG suggests that the following measures are required to address the problems:
  - New franchises need to include a clear mechanism for ensuring that the provision of additional capacity is linked to patronage growth and delivered in a timely manner;
  - Investment is focused on longer trains and platform lengthenings to maximise use of existing route capacity;
  - Franchises need to have adequate resilience built in (including a sufficient level of spare rolling stock to deal with day to day perturbations);
  - Action is required to correct failures in the rolling stock leasing markets including the inconsistency of lease lengths and franchise lengths;
  - A national rolling stock strategy should be developed without delay that includes a strategic pool of rolling stock that can be allocated in the short term to deal with peaks in demand.

PTEG

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