

# **The Future Tube Priorities Investigative Committee**

Mind the gap – between what Londoners want  
and what Londoners get  
January 2003



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Investigative Committee**

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## Chair's Foreword



The alarming news of the tube derailment at Chancery Lane is fresh in all our minds. This timely report highlights the urgent need for a raft of measures to ensure Londoners can travel on the Underground in safety, comfort and on time.

When we carried out our inquiry, the heavy responsibility for implementing these improvements rested with London Underground. But, as this report went to print, the Mayor of London's announcement that he expects to take over the running of the Tube after resolving his dispute with the Government over the PPP means that the burden will soon rest with him. Make no mistake, it will be a burden. The Mayor and Transport for London face monumental challenges. Tube staff, London's council taxpayers and passengers will endure years of delay and dislocation.

Londoners will agree with the Mayor when he says that this city deserves a world-class Underground system. Tube passengers, who between them make one billion journeys a year, know that there is a huge gap between today's Tube and a world-class system.

To achieve vital improvements to the system, targets need to exist that are understandable to the public and reflect their own priorities. We believe that in consultation with the London Assembly, TfL should now produce a set of targets that drive performance on the Underground to deliver the world class Tube system Londoners deserve.

We welcome recent and planned infrastructure improvements, much needed after years of under-investment. However unless we speed the process up, congestion will worsen in the short term as demand continues to grow. We see room for a wide range of management interventions, which will more quickly make a noticeable difference to the quality of the travel experience for Londoners.

Our report aims to contribute to this target setting for the Tube. What we do is compare London's underground system with similar urban systems around the world and come to a view on the standards of service that Londoners should expect from a 21st century metro system. We believe that we should not put up with second-best. We describe what Londoners can reasonably expect.

We now want TfL to tell us how or whether these targets can be met, and over what period. In particular, we need to know whether the current PPP contracts can deliver the improvements we have identified as necessary.

I would like to thank all those who contributed their time to this investigation and our consultants NERA. My five colleagues on the Committee have individually and collectively made valuable contributions for which I thank them.

**Lynne Featherstone**

Chair, Future Tube Priorities Investigative Committee

## **The Future Tube Priorities Investigative Committee Membership**

Lynne Featherstone (Chair)	Liberal Democrat
John Biggs (Deputy Chair)	Labour
Roger Evans *	Conservative
Samantha Heath	Labour
Jenny Jones	Green
Andrew Pelling	Conservative

*\* Roger Evans replaced Angie Bray on the Committee from 16<sup>th</sup> May 2002*

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## Executive Summary

Londoners will agree with the Mayor when he says that this city deserves a world class Underground system. They certainly don't have one yet. The passengers, who make one billion Tube journeys each year, have a right to expect more trains, more space, more reliability. They need safety and security on trains and in stations. They have a right to expect trains and stations which are clean and smart.

The London Assembly has carried out a study of subway systems worldwide, using all the research data available. No foreign trips at public expense were involved in this scrutiny.

The starting point for this Scrutiny was the Tube users' own priorities. London Underground's passenger surveys show that these are:

- Improving train frequencies
- Reducing overcrowding on the underground
- Reducing passenger journey delays
- Improving safety and security for underground users
- Providing a cleaner and more pleasant travelling environment

Our Scrutiny has focused on these areas of key customer concern. By examining in detail the services travellers in six other cities around the world enjoy we have developed benchmarks that Transport for London (TfL) can use to drive service improvements.

Our main findings and ten key recommendations are set out below.

### Improving train frequencies

Increasing train frequency reduces waiting and journey times for customers. With more trains per hour on the busiest lines, especially at peak times, more passengers can be carried. Each train is likely to be less crowded.

Train frequencies vary considerably from line to line and according to time of day. The highest level currently achieved is on the Central Line which runs 29 trains per hour in the peak period. Compared with many other metros London is not far off achieving world-class frequencies on key lines.

A late addition to the PPP contract will deliver significant improvements to the frequencies on the Jubilee Line. This demonstrates that, where the political will exists, technology can be made to deliver improved frequencies.

#### Key Recommendation 1

**Tube users should reasonably expect, with upgraded signalling and better management, minimum frequencies of 35 trains per hour on *a//*the deep Tube lines.**

TfL needs to investigate this target and its relationship to current performance, PPP enhancements and the engineering requirements of such a change.



## **Reducing overcrowding on the Tube**

Travel on the Underground has reached record levels and has increased by 25 per cent in the last decade alone. Planned upgrades to the network are estimated to achieve a maximum of an eight per cent increase in capacity between 2001 and 2011, *but demand is expected to grow in this period by seventeen per cent.*

When TfL takes over the Tube, it has to set new more ambitious targets. Cattle truck standards are not acceptable in the 21<sup>st</sup> century.

Overcrowding is a result of the failure to invest and TfL must develop a comprehensive programme to address this issue. A vision and planning strategy is needed to invest in new lines and other, complementary public transport services to tackle overcrowding. The Government needs to have a strategy to provide the funding to achieve these improvements.

### **Key Recommendation 2**

**New space standards must ensure that where passengers have to stand on Tube trains they should not have to endure the “crush levels” they currently experience. TfL needs to develop a programme of capacity and performance increases driven by the need to reduce overcrowding to the Paris metro standard of 0.25m<sup>2</sup> minimum standing space per passenger at peak times.**

## **Reducing passenger journey delays**

London Underground’s figures show that for 2000/01 there were 2,860 delays of over 15 minutes. Compared to the other cities we looked at, the Tube London performs relatively poorly in terms of reliability.

London Underground have already invested in improvements which have resulted in increases in reliability such as the Northern Line signalling, Central Line track, new procurement measures for rolling stock and escalators and better management procedures to improve staff availability. London Underground promises further improvements such as installing modern signalling systems and replacing all trains, which are currently more than 10 years old, but this will not be complete before 2019.

We believe better management could improve reliability. We want to see staff incentives for good performance. Managers need to deliver a rapid response with targeted action whenever statistics show there is a problem.

### **Key Recommendation 3**

**The number of delays exceeding 15 minutes must be reduced by 30% to match that of the best performing lines on the network within five years of the Tube being handed over to TfL.**

## **Improving safety and security for underground users**

### *Safety*

London Underground is proud of its safety record and we accept that the priority should continue to be to keep risk as low as is reasonably possible. It should be noted that despite this good safety record there clearly are risks on the Tube as we have sadly seen with the Chancery Lane derailment. London Underground’s priority is to keep

those risks as low as is reasonably practical and we expect TfL to confirm this will remain the case.

We are not convinced how, under present plans, with capacity unable to respond to increases in demand, public confidence in the Tube system can be maintained.

#### **Key Recommendation 4**

**That the Mayor of London, as Chair of TfL, appear before the Assembly's Transport Committee within three months of taking control of the Tube to make a statement defining TfL's strategy for safety on the Tube.**

#### *Security*

About three million journeys are made on the Tube each day but there are fewer than 40 crimes a day reported. Investment in CCTV has produced reductions in crimes and the Committee believes TfL should accelerate its programme of installing cameras on board the trains themselves.

#### **Key Recommendation 5**

**TfL should aim to demonstrate an improvement in customer satisfaction ratings of not less than 10% between 2003 and 2008 with regard to safety and security on trains and stations.**

#### *Policing*

The Tube is served by the British Transport Police and 400 officers patrol the entire system. The Committee heard that there is confusion over the boundaries served by this force and the Metropolitan Police. At the very least co-ordination between the two forces should be enhanced to improve personal security on the Tube.

The Mayor of London should press the case for seriously examining the possibility of merging the British Transport Police in London with the Metropolitan Police.

#### **Key Recommendation 6**

**That British Transport Police and Metropolitan Police comment on current staffing levels dealing with crime on the Tube and the justification for maintaining a separate Transport Police. They are also requested to report on the issues in terms of co-ordination between the two forces which need to be addressed to ensure that personal security is improved.**

### **Providing a cleaner & more pleasant travelling environment**

There are low levels of satisfaction with the cleanliness of the Tube, particularly on the trains themselves. London Underground has identified this as a priority for improvement.

Management action on cleaning trains and stations should quickly produce improvements since this does not require major capital investment. Londoners should expect to see this done soon.

#### **Key Recommendation 7**

**TfL should aim to demonstrate an improvement in customer satisfaction ratings of not less than 10% between 2003 and 2008 with regard to cleanliness on trains.**

The high temperatures on board trains, made worse through overcrowding and by trains being stopped in tunnels, is an area of particular concern. London Underground told us that air conditioning is not a practicable solution. This means they choose not to afford it. Other networks abroad have found ways of cooling their trains.

Londoners have a right to expect cooler trains, and management must take this requirement seriously.

### **Key Recommendation 8**

**TfL must present plans and costed options for cooling trains within a year of control of the Tube passing to their management.**

### **Information provision and customer care**

The relationship between London Underground's staff and their customers is an area for much needed improvement. Users of the Tube wish to see more staff on hand on platforms and other areas of the system who, when they are asked to help, can do so in a knowledgeable and polite manner. This is an area that TfL should be able to improve upon in a relatively short time since it does not require major capital expenditure.

### **Key Recommendation 9**

**That TfL reports within one year on their plans for reallocating staff freed from ticket office duties following their ticketing initiatives to duties that are more focused on providing help and information to customers.**

### **Improving the Tube's accessibility**

The fact that many stations were designed and built long ago, the existence of deep tunnels, and space restrictions all contribute to the fact that, currently, only a small proportion of London Underground's stations can be classed as truly "step-free". The evidence received by the Committee indicates that groups representing those with disabilities largely accept that complete step-free access is a long-term goal rather than one that can be attained in the short to medium term.

Londoners can expect improvements in the accessibility of the Tube for the disabled and others such as those with pushchairs or cycles, but the complex nature of the system and the configuration of all but the newest stations means that progress may seem slow and that concerns will still remain.

### **Key Recommendation 10**

**That TfL report on their plans for achieving the "core accessible network" by June 2003 and any changes to funding, feasibility studies or other factors which are mentioned in "Unlocking London for All" which could result in significant delays to the step free access development plan.**

## **Introduction - The Tube Future Priorities Report**

The question of service targets and performance indicators for the Tube is one with a direct and practical relevance for millions of Londoners. They use the Tube regularly, often daily, experience both its strengths and its shortcomings, and have views on what needs to be improved. As the Tube moves from the control of London Underground Limited (LUL) to Transport for London (TfL) there is an opportunity to set targets and standards for our underground system which meet the concerns of Londoners and drive service delivery.

Our report aims to contribute to this target setting for the Tube. What we do is compare London's underground system with similar urban systems around the world and come to a view on the standards of service that Londoners should expect from a 21st century metro system. We believe that we should not put up with second-best. We describe what Londoners can reasonably desire.

We now want TfL to tell us how or whether these targets can be met, and over what period. This technical exercise is the necessary next step in determining the service delivery standards to be applied to the Tube in future years. In particular, we need to know whether the current PPP contracts can deliver the improvements we have identified as necessary. We believe that TfL is the proper body in the first instance to undertake such an analysis and that this analysis should constitute the response of TfL to this preliminary report.

The comparative material contained in this report, and the technical analysis to be produced by TfL, will form the basis of future work by the London Assembly Transport Committee designed to secure realistic but challenging service delivery standards for our Underground.

The purpose of this Scrutiny is not to focus on the relative merits of funding the improvements needed to the Tube by either PPP or other methods. Whatever method is finally approved it will still mean substantial investment over the next thirty years. The central concern of the Committee is that this investment should produce a real improvement in the service provided to those who use the system. The investigation therefore looks to produce a set of targets and benchmarks by which the Mayor, or whoever runs the Tube, can work towards achieving.

# 1 Background

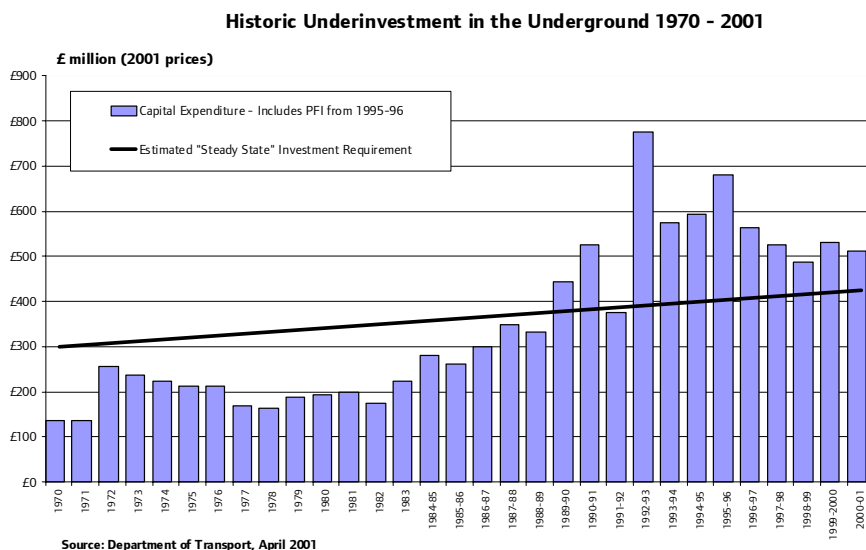
*This section introduces the purpose of this scrutiny investigation, the scale of investment needed to be made on the London Underground, the kind of services which are taken for granted by travellers in other world cities and the Committee's approach to measuring realistic expectations.*

## Purpose of Scrutiny

- 1.1 The Mayor has said that London, as a world-class city, deserves a world class Underground system. In this scrutiny we aim to describe what a world-class underground system should look like; what realistic, yet demanding, benchmarks should be used to assess the Tube system of the future; and what Tube service standards Londoners deserve and ought to expect.
- 1.2 In identifying these standards the Committee is concerned to establish how much improvement we can reasonably demand from our Tube system, and to do so, examined in detail the services which other cities take for granted.

## The Need for Improvement

- 1.3 London's Underground system has benefited from considerable investment over the past 15 years, including completion of the Jubilee Line Extension, modernisation of the Central Line, complete replacement of rolling stock on the Central, Northern, Jubilee and Waterloo & City lines, heavy refurbishment of other rolling stock, and station refurbishment.
- 1.4 Despite these recent improvements there is still much to do. There is widespread agreement that the London Underground has suffered from underinvestment for decades. Government figures state that from 1979 to 1997 the average core investment was £395 million a year. Historically this did not even match that needed to maintain the system in a "steady state" let alone keep up with increased demand.<sup>1</sup> The figure below illustrates the degree of underfunding, particularly during the 1970s and 1980s.



<sup>1</sup> Department for Transport, April 2001 - <http://www.local-transport.dft.gov.uk/pppoffer/index.htm>

## **Funding Issues**

- 1.5 The two main options for funding the needed improvements are well known. The Government prefers the Public Private Partnership option whereas the Mayor advocates funding through a bond system linked to future revenues from ticket sales.
- 1.6 The purpose of this Scrutiny was not to focus on the relative merits of funding the improvements needed to the London Underground by either PPP or other methods. Whatever method is finally approved it will still mean substantial investment over the next thirty years. The central concern of the Committee was that this investment should produce a real improvement in the service provided to those who use the system. The investigation therefore looked to produce a set of targets and benchmarks by which the Mayor, or whoever runs London Underground, can work towards achieving.

## **Comparator Systems – World Class Performance**

- 1.8 Other metro systems across the world have some of the following services which are not enjoyed by users of the London Underground. These include:
- In New York a 24 hour a day service (18 hours in London)
  - In Paris, an average distance between stations of 700 metres (1600 metres in London)
  - In Madrid a best peak hour service of 40 trains per hour (29 trains per hour best in London)
  - Air conditioning on all trains in Singapore and Hong Kong and most trains in New York.
- 1.9 These levels of service reflect, of course, the different characteristics of other cities' metro systems. Whilst taking account of the basic differences between London's tube system and those of other cities, the Committee wanted to find out whether the performance of the London Underground could match these levels of service. We selected a number of other systems to compare London's performance against and these are described later in this report at section 2.11 below.

## **Realistic Expectations**

- 1.10 London Underground conducts regular customer satisfaction surveys, which it uses to identify priorities for improvement. It is clear from this information that those using the Underground expect more frequent trains which are less crowded. They want fewer delays to their journeys and increased levels of safety. They also want a cleaner environment on the Tube system.<sup>2</sup>
- 1.11 In this report we examine whether these priorities are reflected in London Underground's current performance and future plans.

## **The Consultants' Technical Report**

- 1.12 The Committee commissioned National Economic Research Associates (NERA) to assist with technical aspects of the investigation and conduct a survey of

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<sup>2</sup> London Underground written evidence, September 2001.

other comparable metro systems. NERA's extensive technical report has been published to accompany this report and we make reference to this throughout.

- 1.13 We are grateful to our consultants for their advice and assistance and we would also like to record our thanks to those who submitted written and oral evidence to the Committee. A full list of those who contributed to this Scrutiny is set out in Appendix 1.

## 2 The London Underground

*This section describes the London Underground in terms of its physical characteristics, the growth in demand and pressure on the system, and introduces other cities' metro systems which the Committee used to compare the performance of the London Underground.*

### The London Underground

- 2.1 London's Underground system is the oldest in the world, with the first line built in 1863. It is also one of the largest and most complex systems in the world, with the following important characteristics:
- The London Underground is 414 kilometres long, around 45 per cent of which is underground. The lines are a combination of deep tunnels (35 per cent), sub-surface (10 per cent), and overground (55 per cent). The only other system in the world of a similar size is New York. Other systems are smaller – Moscow, 250 kilometres, and Paris, the fourth largest has just over 200 kilometres of line.
  - London Underground carried 970 million passengers in 2000/01. While a number of systems carry more (such as New York, with around 1,100 million, Tokyo with over 2,000 million, and Moscow with over 3,000 million a year) this figure still makes London Underground one of the busiest systems worldwide.
  - There are 12 lines on the London Underground, larger than the number normally found on other metros (the largest is New York with 25, followed by Paris with 14).
  - There are currently 275 stations on the network. Again, this number is large by international standards, and is only exceeded by New York and Paris.
  - There are almost 4,000 carriages compared with 5,800 in New York and 3,500 in Paris.
- 2.2 The age of the system is a major obstacle to improving London's Underground. The geographical layout was not designed with modern commuter populations' demands on mass transit systems in mind and has suffered from piecemeal development for more than 100 years.
- 2.3 A major problem affecting the tube network is the small tunnel diameter, which limits the train cross section, so reducing the number of passengers that can be carried and leading to on-train overcrowding.
- 2.4 Some lines, especially the sub-surface District, Metropolitan and Circle lines, have junctions that cause conflicting movements between trains that can contribute to delays. Other difficulties concern the complexity of the network (number of lines, where/how they intersect, etc) compared to simpler systems elsewhere in the world.

### Trends in demand

- 2.5 Nearly one billion journeys are made on the London Underground each year. Figures show the number of passengers travelling on the Underground has



grown strongly in recent years, and is forecast to continue to grow, which will worsen the current capacity problems unless there is adequate investment in the short-term.

- 2.6 Travel on the Underground has reached record levels. This continuing growth in demand, over 4.5 % in the last year and 25% in the last decade, places increasing strain on the ageing network and further emphasises the need for sustained and substantial investment in the system.<sup>3</sup> A reflection of this growth in ridership is the average number of passengers per train which has grown 12.5 per cent in just five years. The implications of still further increases in demand are discussed in section 6.

### **Customer Satisfaction**

- 2.7 Figures provided by London Underground show that customer satisfaction has risen from around 65% in 1990/91 peaking at 80% in 1994-95 and fluctuating between 75-80% since then. London Underground suggests that this levelling off in the level of customer satisfaction reflects record demand and increased overcrowding.<sup>4</sup>
- 2.8 **The Committee welcomes the recent improvements in customer satisfaction levels but is concerned that London Underground set targets for continuing improvement in satisfaction levels in the future, not just maintaining current levels.**

### **Customer Priorities**

- 2.9 London Underground conducts regular customer satisfaction surveys, which it uses to identify priorities for improvement. The current information suggests customers have the following priorities:<sup>5</sup>
- Improved frequency (28%)
  - Reduced overcrowding (26%)
  - Reduced delays (18%)
  - Improved passenger safety (18%)
  - Cleaner stations (17%)
  - Cleaner trains (16%)
- 2.10 To understand whether these priorities can be reasonably reflected in an improved London Underground the Committee needed to examine what levels of service have proved to be possible on other systems across the world.

### **Can London Expect a World Class Tube? The Comparator Systems**

- 2.11 By comparing the performance standards of other metro systems the Committee hoped to find out what is being achieved by other cities. To do this it is necessary to compare like with like, so that results are not distorted by differences in the social and economic environment in which the metros operate.

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<sup>3</sup> London Transport Annual Report 2000/1.

<sup>4</sup> London Underground written evidence, page 1, September 2001.

<sup>5</sup> London Underground written evidence, page 14, September 2001.

Unfair comparisons can also result from differences in the characteristics of the systems themselves and by differences in the way data are collected or measured. In making fair comparisons between metro systems the Committee relied heavily on data from the Community of Metros (CoMET) database which holds information on nine of the world's largest systems.

### **The CoMET Database**

Benchmarking metro systems is difficult. Each metro system has its own culture, its own definition of terms, physical characteristics etc.

To overcome these problems, in 1994 London Underground and four other metro systems formed a group to share performance data with each other. In 1996, these systems and three more formed themselves into the CoMET group, which by 1998 consisted of nine large metro systems.

The members of the CoMET group are:

- London
- Berlin
- Hong Kong
- Mexico City
- Moscow
- New York
- Paris
- Sao Paulo
- Tokyo

The objectives of CoMET are to:

- Build a system of measures to identify best practice which can be accepted and used by mass transit railways;
- Use the system of measures for internal management;
- Help prioritise areas for improvement; and
- Provide comparative information.

To meet these objectives, a system of 32 key performance indicators has been developed, including measures both of a "hard" operational nature and of a "soft" customer focused orientation.<sup>6</sup>

To ensure the collaboration of all CoMET members, a confidentiality agreement has been signed whereby they can share all the data amongst themselves but cannot publish the data externally with metro names attached.<sup>7</sup>

2.12 Trying to compare similar systems means that systems such as Rotterdam, Munich and Hamburg have not been considered as they are smaller, less complex networks. Similarly, the Committee avoided making comparisons with modern systems such as Singapore and Hong Kong, which do not face the historical constraints of the London system.

2.13 An additional problem for the Committee arose from data availability. Although Tokyo was initially considered as a comparator, the very limited data available

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<sup>6</sup> Transport Operations Scrutiny Committee, minutes 12<sup>th</sup> June 2001.

<sup>7</sup> NERA final technical report section 4.4.

from published sources (other than the CoMET database) prevented us from studying the Tokyo underground system in detail.

- 2.14 We selected the following metro systems to act as comparators to London Underground: New York, Paris, Berlin, Stockholm, Madrid and Barcelona. Summaries of the characteristics of the comparator systems are contained in Appendix 2.

### 3 Performance Measurement and Target Setting

*In this section we look at performance measurement and the issues surrounding setting realistic and achievable benchmarks by which the future Tube should be judged. These will be addressed in the remainder of the report across all the main features of the Underground service.*

#### Targets and Performance Measurement

- 3.1 One of the most important outcomes of this investigation is the ability to set out some of the realistic and achievable benchmarks and performance targets by which the Committee believes the future Underground should be judged.

#### Target Setting

- 3.2 London Underground already operates its own internal system of targets for levels of service, known as the Customer Service Delivery Standards (CSDS). The CSDS cover the following key areas:
- Accessibility and interchange – covering for example, interchange with buses, national rail, cars, and bicycles, layout planning, opening hours, step free access and the provision of lifts.
  - Ambience – covering e.g. advertising, lighting, air quality, train condition, litter, graffiti and station condition.
  - Amenities and facilities – e.g. space, seats, clocks, telephones, litter bins and retail units.
  - Customer relations – e.g. handling of customer comments, and the Customer Charter.
  - Customer information – e.g. visual electronic information, audible information, signed information and information provided by staff.
  - Personal security – e.g. design considerations, security monitoring, emergency help facilities and staff action.
  - Standards for staff – e.g. staff numbers and deployment, skills, knowledge, appearance, and helpfulness.
  - Standards for ticketing – e.g. availability of ticket vending facilities, and the behaviour and knowledge of ticket office staff.
  - Standards for train service – e.g. service frequencies, on-train congestion, closures, operating hours, and travelling time.
- 3.3 The CSDS are detailed, and the examples given above are just a selection of the high level headings under which more detailed standards are set. CSDS are made available to the public on request and from London Underground's web site.<sup>8</sup>
- 3.4 The Committee was aware of these standards when considering setting targets and monitoring the Underground's future performance. But using the CSDS as the sole basis for monitoring is not perfect, given the very large number of

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<sup>8</sup> The Customer Service Delivery Standards document "London Underground's Commitment to Customer Service" is 53 pages long and can be found at: <http://www.thetube.com/content/about/commit.pdf>.

standards covered, and the descriptive nature of some of the standards which makes monitoring progress difficult. The CSDS are aimed at articulating London Underground's commitment to the customer, rather than at setting specific performance targets for the future.

### **Targets Set by Transport for London**

- 3.5 The Mayor's Transport Strategy sets out his targets for the Underground over the next ten years (Appendix 3). Some of these targets are qualitative rather than quantitative or easily measurable, and some do not have specific timescales attached to them. However, it is important for TfL to bear these targets in mind when setting its own targets and monitoring future performance, not least to ensure that there are no inconsistencies in target-setting.
- 3.6 Among the most important of the Mayor's proposals in terms of improving reliability of the system are:
- Requiring LUL to produce proposals for returning the percentage of Underground services operated to levels observed between 1991 and 1996. (It is unclear whether this refers to the minimum performance during this period (94.5 per cent), to the average (around 96 per cent) or to the best (97.5 per cent). The 2000/01 performance on this measure was 91.5 per cent.)
  - Requiring LUL to halve 2000/01 delays caused by equipment failures by 2008. (Whether this applies to delays of a specific duration or to all delays is not clear).
  - Requiring LUL "as a matter of priority" to implement a programme to solve the problem of out of service lifts and escalators. (The programme was to be in place by early 2002, but specific time targets for the solution are not given, nor is a definition of the solution.)
- 3.7 The Mayor's Transport Strategy also notes that "Targets will be set by TfL to improve Underground performance to reach the benchmark of comparable world city metros".<sup>9</sup>

### **Benchmarking – Some Issues to be Considered**

- 3.8 The Committee was concerned that a balance should be struck between setting a sufficient number of targets to cover all key performance areas, and the danger of setting too many targets, which would become more difficult to monitor and which might be less meaningful to the general public.
- 3.9 A significant amount of monitoring already takes place of the system by a number of bodies outside of London Underground<sup>10</sup>. So when setting targets, it is important that they do not conflict with targets imposed by others (for example those set by the Mayor such as those detailed in Appendix 3 referred to in 3.5 above). Similarly, it is important that they do not create "perverse incentives" for managers to concentrate on performance in specific areas to the

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<sup>9</sup> Proposal 4C.5, page 132, Mayor's Transport Strategy, July 2001.

<sup>10</sup> For example Crime Concern, London Transport Users Committee, Greater London Action on Disability and Capital Transport Campaign.

detriment of performance in other areas that, while still high priority to passengers, are not measured.

- 3.10 For this reason, the Committee had to consider whether to take a broad approach to its recommendations on monitoring, and not to over-emphasise LUL's performance against just a few headline indicators.
- 3.11 At some of the evidential hearings, frustration was expressed with the fact that targets and monitoring measures used tend to change over time, sometimes making it difficult to compare trends over anything more than a few years. While some change is inevitable given shifting changes in customer preferences and expectations, changes over time to the definitions of targets set should be minimised so as to allow effective comparisons with previous years and to permit, wherever possible, a continuous trend to be monitored with the earlier data.

### **Examination of London Underground's Service and Future Levels of Improvement**

- 3.12 The rest of this Report looks at aspects of the Tube service against customer expectations and London Underground's plans for improvement. It suggests some targets that Londoners should reasonably expect as a result of the investment planned across the system in the next 15 years and beyond.

## 4 The Priorities of the Future Tube System – The Committee’s Approach

*In this section we discuss the Committee’s approach to investigating the performance of the Tube system and how we decided on the structure of our Report. The priorities of those who use the Tube, we decided, should be the principal focus.*

4.1 In section 3.3 we outlined how London Underground operates its own system of targets for various aspects of the Tube’s performance. These Customer Service Delivery Standards cover the following “high level” indicators:

- Accessibility and interchange
- Ambience
- Amenities and facilities
- Customer relations
- Customer information
- Personal security
- Staff
- Ticketing
- Train service.

4.2 The Committee was of the opinion that these categories, while useful for internal purposes to London Underground, do not reflect what the customer actually experiences or their key concerns. To produce a report that divided the performance of the Tube system into such distinct and technical elements would not focus on what the customer really wants or understands.

4.3 Section 2.9 above highlights what the priorities of the customers currently are. The following sections of this Report use these priorities to look at what the current service delivers and what Londoners should expect in the future following the massive investment in it which is promised. This Report therefore uses the following headings, which we hope clearly sets out what the users of the system want:

- Improving train frequencies
- Reducing overcrowding on the system
- Reducing delays to passengers journeys
- Improving safety and security for those using the Underground
- Providing a cleaner and more pleasant travelling environment
- Information provision and customer care
- Improving accessibility on the Underground
- Improving integration with other forms of transport.

We believe these last three headings, though not among the stated customer priorities, should also be central to London Underground's commitment to providing continuous improvement to the users of the system.



## 5 Improving Train Frequencies

*This section discusses how to improve train frequencies – the customers’ highest priority. It looks at the current performance of the system compared with frequencies enjoyed by users of other systems, London Underground’s plans for the future and barriers to improving the service still further.*

- 5.1 Improving the frequency of the train service is the number one priority for users of the London Underground. Increasing train frequency not only reduces waiting and journey times for customers, but is also the most significant way of increasing the capacity of the system. This also helps to reduce overcrowding – another priority which we discuss later in this Report.
- 5.2 We investigated what has been achieved elsewhere in the world in terms of train frequencies and also the technology now available, which can improve train frequencies still further. The Committee is aware, however, that there are ultimately physical constraints, determined by the age and design of the Underground, which make these theoretical improvements difficult to achieve.
- 5.3 London Underground’s “Train Service Standards” require a consistent, high frequency service in the central area and a “turn up and go” service in outer areas so that customers do not feel obliged to time their arrivals. In practical terms, customers should reasonably expect a scheduled interval between trains no greater than 5 minutes in the central area and 10-15 minutes in the outer area.<sup>11</sup>
- 5.4 Train frequency levels vary by line and by time of day, from 29 trains per hour on the Central Line in the peak, to six on parts of the Metropolitan Line in the off-peak.<sup>12</sup> The table below illustrates the variation for a selection of lines.

### Train Frequencies

Line	Peak frequency (trains per hour)	Off-peak frequency (trains per hour)
Central	29	18
Victoria	28	18
Jubilee	24	16
Piccadilly	27	21
District	22.5	17.5
Metropolitan	15	6
Circle	7.5	7.5

- 5.5 The maximum frequency that can be operated is determined by a variety of factors such as:
- The spacing of trains (as determined by the signalling system),
  - The speed of the train (including acceleration and deceleration),
  - By time spent stationary at the platforms (dwell time),

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<sup>11</sup> London Underground written evidence, September 2001.

<sup>12</sup> Peak hours are 0700 to 1000 and 1600 to 1900, Monday to Friday (excluding public holidays).

- The size and availability of the trains themselves,
  - The layout of the lines themselves (including branch lines and intersecting junctions).
- 5.6 Some metro systems run at frequencies well in excess of those achieved on the London Underground but these are often simple shuttle systems and have trains designed more for speedy boarding and alighting than in-journey comfort.<sup>13</sup>

### **International Comparisons**

- 5.7 Peak frequency levels in Paris and on the best line in Madrid are slightly better than those typically seen on the best lines in central areas of London where the highest frequencies are just below 30 trains per hour or just over one every two minutes on average. Typical off-peak frequencies in Paris and Madrid are similar to the averages for London. In New York, frequency levels are probably similar to those seen in London, though the comparison is complicated by the widespread occurrence of fast services there. In Berlin and Barcelona, frequency levels are somewhat lower than in London, both during peak and off-peak hours.
- 5.8 **This comparison of London train frequency statistics with those seen in other “comparable” metro systems suggests that London is not far off achieving world-class train frequency levels on key lines.**
- 5.9 However, there would appear to be scope for improvement by increasing peak service train frequencies on all London Underground lines, where overcrowding warrants it. This is more likely to be in the central areas but the Committee would also wish to see improvements to the peak frequencies that LUL has achieved on some lines (e.g. 29 per hour on the Central line, 28 per hour on the Victoria line) *across all lines*.
- 5.10 LUL already has plans to increase frequency on a number of lines. Key examples include plans to upgrade signalling on the Northern, Piccadilly and Victoria lines over the next 15 years.<sup>14</sup> LUL intend to further increase frequency to 33 trains per hour on the Central line, and to 24 trains per hour on the Jubilee line. LUL have longer-term aspirations to increase frequencies to 36 trains per hour or more on various lines. London Underground do not believe that there is at present the technology in a deep tube environment that is capable of operating more than 33 trains an hour.

### **Constraints to Improving Frequency**

- 5.11 London Underground gave evidence that, at present, most lines suffer constraints caused by fleet size and signalling capacity, although these are likely to be addressed by the line upgrades. There are other constraints on the existing network (much of which dates back to Victorian times), which present a

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<sup>13</sup> LTUC written evidence, October 2001.

<sup>14</sup> The proposed PPP improvements include a 25 per cent reduction in train, signal and track faults on the Northern Line and a 10 per cent improvement in signal reliability. The Piccadilly Line will see a 32 per cent reduction in train, signal and track faults with a 10 per cent improvement in signal reliability. The Victoria Line will see reliability improvements of 41 per cent in trains, 32 per cent in track and 26 per cent in signalling.

ceiling on achievable train frequencies given known technology. Of course, new lines can be designed to operate at higher frequencies however the ongoing Jubilee Line signalling problems show that the full potential is yet to be realised.<sup>15</sup>

- 5.12 Improving frequency is not just an end in itself. More frequent trains using track and signalling which remain unreliable will lead to more delays should faults and breakdowns occur. A careful balance must be struck to ensure the system as a whole improves.

### **What Can Londoners Reasonably Expect?**

- 5.13 If the London Underground is to be classed as a “world class” system Londoners should be able to expect greater train frequencies in the peak than those they currently receive. This is particularly true for the centre of London since LUL have already demonstrated they can provide high frequencies on some lines (paragraph 5.9 above). LUL’s current plans to upgrade signalling systems on a number of lines should make significant improvements to current frequency levels within the next 15 years, but, were it to have the appropriate levels of funds, LUL could arguably do more.
- 5.14 Comparisons with systems overseas suggest that LUL could make some improvements to train frequency over those planned, but that on some lines in particular, these would be relatively small and would not on their own “solve” current or forecast capacity problems.

*NERA report section 7.4.1*

For example, it is estimated that with “state of the art” line side signalling technology, LUL might be able to increase train frequencies to around 36 trains per hour per direction (tph). The introduction of cab and moving block signalling could increase this to an absolute maximum of around 42 tph further into the future (the final figure will be driven by the detailed constraints on each line and the degree of timetable robustness sought but we expect it to lie in the 40 to 45 tph range for each line).

- 5.15 Improvements much beyond these levels are unlikely to be feasible in the foreseeable future and indeed such figures are very close to the ultimate physical constraints imposed by station dwell times and rates of train acceleration and deceleration that are acceptable for passenger comfort.

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<sup>15</sup> London Underground, written evidence 28<sup>th</sup> June 2002.

**Key Recommendation 1**

**Tube users should reasonably expect, with upgraded signalling and better management, minimum frequencies of 35 trains per hour on *all* the deep tube lines. TfL needs to investigate this target and its relationship to current performance, PPP enhancements and the engineering requirements of such a change.**

*Supplementary Recommendation 1A*

TfL should justify how planned increases to 35 – 38 trains per hour on the Jubilee line can be achieved on other lines within 15 years.

*Supplementary Recommendation 1B*

Signalling companies should comment on the technical feasibility of achieving frequencies of 42 trains per hour on the London Underground.

5.16 Since London Underground have already indicated their intention to increase the frequency of the Central Line from 29 to 33 trains per hour, this should be achieved well within the 15 year period. Where a much more substantial increase is required to meet our benchmark (e.g. Jubilee Line at 24 trains per hour), the full time period may be needed.

## 6 Reducing Overcrowding on the Underground

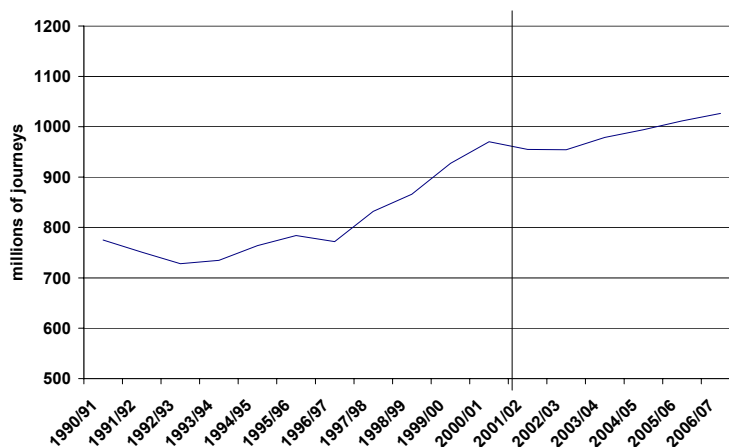
This section deals with overcrowding on the London Underground which is the second highest customer priority. It looks at the current situation, which is one of a system which is trying to cope with record levels of demand, and forecasts of an even more crowded system in the near future.

- 6.1 Reducing overcrowding features consistently as one of the highest priorities for improvement identified in customer surveys on the London Underground. London Underground currently suffers excessive levels of crowding both on trains and in stations on a fairly regular basis, predominantly in peak hours.

### Growth in Passenger Demand

- 6.2 The number of passengers using the Underground strongly reflects factors such as the state of the London economy, population growth and the impact of tourism. The Mayor's "London Plan" forecasts that London will grow rapidly, driven by powerful market and demographic forces which cannot be realistically reversed. Over the next two decades, London's population is expected to grow by around 700,000 people and more than 600,000 new jobs are likely to be created over the period of the London Plan.<sup>16</sup>
- 6.3 The number of passengers travelling on the Underground has grown steadily in recent years and is forecast to continue to grow, making current overcrowding worse if no investment is undertaken to increase capacity. The graph below shows this growth and predicted demand.

### London Underground Passenger Journeys *per annum*



Source: Historical figures TfL, forecasts LUL.

#### NERA report section 3.2

If passenger kilometres are divided by train kilometres, average "train loading" figures can be derived - the average number of passengers per train. While average train loadings fell in the early to mid 1990s, much of the growth in passenger journeys and passenger train kilometres since 1996/97 has been accommodated by increases in average train loadings, rising from 104 in 1996/97 to 117 in 2000/01.

<sup>16</sup> The Draft London Plan, the Mayor's Draft Spatial Development Strategy for Greater London, June 2002.

6.4 London Underground measure crowding using three key measures relating to the percentage chance of being on a train with:

- All seats full;
- One person standing for every person sitting; and
- Two persons standing for every person sitting.

The Committee saw evidence on these measures that the chance of a passenger finding all seats full is now 61 per cent (up one point from 2000) while the chance of two passengers standing for every seated passenger was 2 percent in 2000.<sup>17</sup> **The Committee is of the opinion that these figures do not reflect the actual experience of the passenger, particularly in peak hours and in the central area.** Our conclusions are based on the way London Underground averages overcrowding figures across the entire network, which distorts the publicly presented picture of overcrowding. We make recommendations on presenting these figures more clearly at the end of this section.

6.5 Evidence from Capital Transport Campaign also focussed on this particular issue. Capital Transport Campaign quoted evidence from *Hansard* in December 2001 showing that on all but two lines, passenger numbers in peak times on the Tube exceeded London Underground's planning standard of one passenger standing for each passenger seated, and on five lines the passengers carried are twice the planning standard of one passenger standing for every one passenger seated.<sup>18</sup>

### **International Comparisons**

6.6 London Underground's way of measuring crowding differs from other metros such as New York, Paris and Madrid where crowding statistics look at the amount of standing space (in square metres) that each person has.<sup>19</sup> However because the average journey length on the London Underground is significantly longer than that on many other metro systems, the availability of seats is a more important consideration in London than might be the case on some other systems (e.g. Paris in particular).

6.7 **The Committee believes that TfL should apply separate standards to Zone 1 of the Tube that are more like those used in other cities.** For example a passenger travelling from Oxford Circus to Victoria has entirely different needs to one travelling from Amersham to Baker Street<sup>20</sup>, particularly in respect of the availability of seating and the average amount of personal space that is available.

### **Future Levels of Overcrowding**

6.8 London Underground expects, over the next 30 years, that passenger growth on the system and improvements in capacity on the system will generally balance

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<sup>17</sup> London Underground information provided to NERA. NERA final report section 8.2.

<sup>18</sup> Capital Transport Campaign, supplementary written evidence dated 31<sup>st</sup> January 2002.

<sup>19</sup> New York has a minimum standing space of 0.28m<sup>2</sup>, Paris 0.25m<sup>2</sup> and Madrid 0.16m<sup>2</sup> in peak hours.

<sup>20</sup> Passenger priorities in Zone 1 are for frequent services rather than finding a seat for relatively short journeys.

each other. However, as the Mayor's Transport Strategy sets out, even with upgrades to the existing network, the problem of overcrowding on the London Underground is set to get worse over the next ten years. **Planned upgrades to the network are estimated to achieve a maximum of an eight per cent increase in capacity between 2001 and 2011, but demand is expected to grow in this period by seventeen per cent. Overcrowding will inevitably get worse.**

- 6.9 London Underground indicated that over the next few years increases in loadings on the Jubilee Line will mean that it will become the most crowded line on the network (though capacity enhancements will eventually alleviate this).<sup>21</sup> The Committee finds this difficult to reconcile with LUL's own standards which state that "Service frequencies and patterns, when new or refurbished rolling stock is being introduced, must be sufficient to obviate the need for any customer to stand for more than 15 minutes. Seating for at least one sixth of the maximum capacity of each car must be provided".<sup>22</sup>
- 6.10 However, to deliver real reductions in crowding levels, the best solution is the construction of new lines and other public transport alternatives. It is therefore essential that new schemes such as the two Crossrail schemes; proposals for trams; and improvements to bus services are realised as soon as possible. These proposals must all be delivered as together they relieve different aspects of congestion on the system: Crossrail 1 will particularly relieve pressure on east-west routes, notably the Central Line and parts of the Jubilee Line. Crossrail 2 will relieve pressure on the central sections of the Victoria and Piccadilly lines, while Thameslink 2000 and the Cross-River Transit scheme would assist the Northern and Bakerloo lines.
- 6.11 Overcrowding is not just an issue that affects the chances of a comfortable journey. There are potential risks to passenger safety in the event of an accident as it is recognised that standing passengers experience more serious injuries than those who are seated.<sup>23</sup> There are also issues as to whether severely overcrowded trains can be safely evacuated should the need arise in sufficient time to prevent serious injury.
- 6.12 London Underground's method of recording levels of crowding does not appear comparable with that of other metros and it appears that it no longer monitors crowding figures on the basis of four-weekly periods as it did in the 1990s.<sup>24</sup> **The Committee believes that London Underground should urgently review these methods of recording crowding levels better to reflect the passenger experience particularly in the Central zone. The Committee has been told that London Underground is technically able to produce these statistics.**<sup>25</sup>

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<sup>21</sup> London Underground. Evidentiary hearing 16<sup>th</sup> May 2002.

<sup>22</sup> London Underground, June 2001, Customer Service Delivery Standard I1.02 On Train Congestion page 46.

<sup>23</sup> Capital Transport Bulletin February/March 2001, Capital Transport Campaign, supporting evidence.

<sup>24</sup> Monopolies and Mergers Commission Report on the Underground 1991.

<sup>25</sup> London Underground. Evidentiary hearing 16<sup>th</sup> May 2002.

## **Key Recommendation 2**

**New space standards must ensure that where passengers have to stand on Tube trains they should not have to endure the “crush levels” they currently experience. TfL needs to develop a programme of capacity and performance increases driven by the need to reduce overcrowding to the Paris metro standard of 0.25m<sup>2</sup> minimum standing space per passenger at peak times.**

### *Supplementary Recommendation 2a*

London Underground monitor and publish overcrowding statistics on all lines in the Central zone. These figures should be reported publicly on a four week basis.

### *Supplementary Recommendation 2b*

London Underground should provide forecasts of changing levels of crowding for each line within the Central zone and its plans for reducing these crowding levels over the next 15 years.



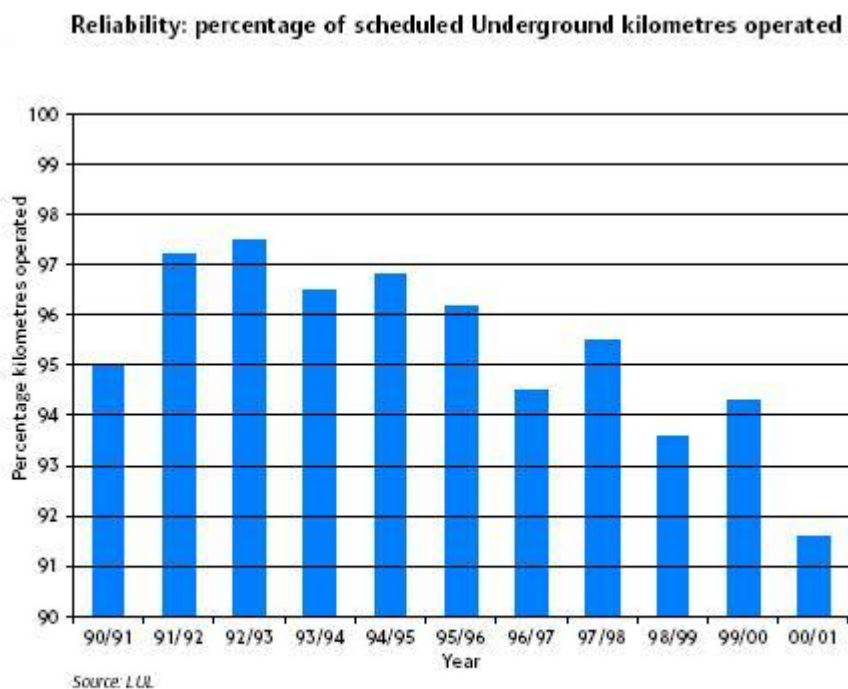
## 7 Reducing Passenger Journey Delays

*The passenger's journey is made up of a number of different elements – queuing for tickets, waiting for the train and the train ride itself. All these have an impact on overall journey time and all of these contribute to the overall passenger experience. Passengers want a reliable service and this means one which has few delays and cancelled services. This section deals with reliability of trains, lifts and escalators, waiting and journey times.*

- 7.1 This Report has already looked at improving train frequencies and reducing overcrowding - the highest priorities for passengers. This section looks at another aspect of improved service – that of reducing delays to the journey. Reducing delays is important since these can allow more trains to run at higher frequencies. Reliability therefore plays a particularly important part in delivering the Tube system Londoners want.

### Reliability of the Service

- 7.2 Greater reliability would improve performance in terms of overcrowding and increased frequencies, however train delays, cancellations which were attributable to London Underground, and scheduled train service kilometres not operated all show upward trends since 1996/97. The figure below from the Mayor's Transport Strategy shows the declining reliability of the service since the 1992/93 peak in terms of the percentage of scheduled kilometres operated.<sup>26</sup>



<sup>26</sup> The Mayor's Transport Strategy, page 120, July 2001.

- 7.4 The following figures show the proportion of delays to trains by different causes for the first six months of 2001/02. Delays which were attributable to London Underground represented 72 per cent of the total.

#### **Reasons for Delays on the Tube Attributable to London Underground<sup>27</sup>**

##### Cause of Delay

Staff Absence	13%
Rolling Stock	19%
Signals	23%
Infrastructure	2%
Track	11%
Other	5%

- 7.5 72 per cent of delays are attributable to London Underground, the remainder being due to events largely outside their control such as passenger action, and security alerts. Of attributable delays, staffing problems, rolling stock problems and signalling problems are the three biggest causes, together accounting for 55 per cent of attributable delays. However, the number of train delays caused by staff problems has fallen in the second half of 2001 and this has made a significant contribution to reduced delays across the system.

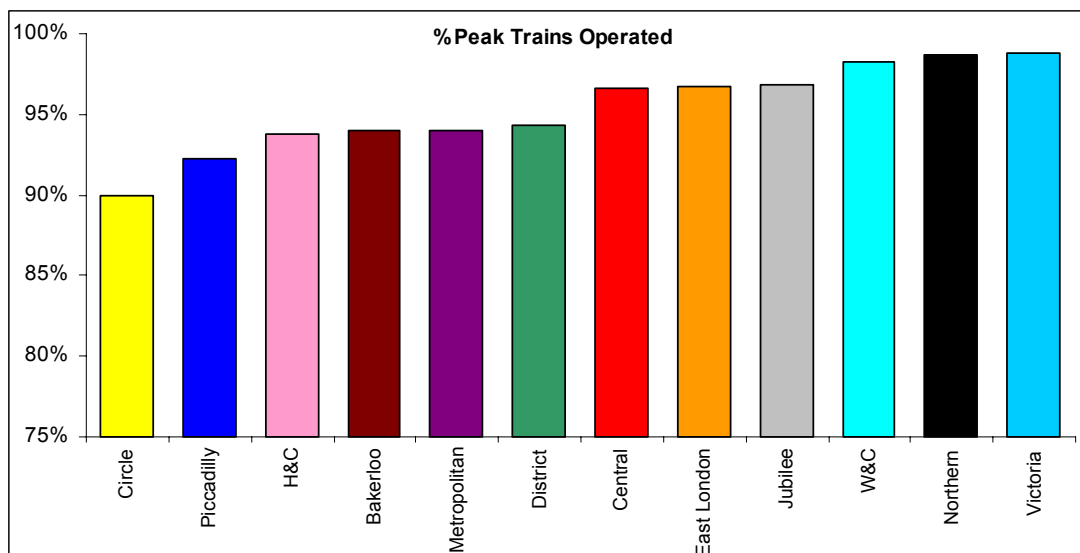
#### **Train Service Reliability Across the System**

- 7.6 There are significant differences in the reliability across the London Underground system. London Underground measures the reliability of the system by "Excess Journey Time". This reflects the additional journey time over and above that which a passenger should expect if all trains were running to schedule.
- 7.7 Across the whole system, reliability in 2001/02 showed significant improvement over the previous year, with network Excess Journey Time falling from 7.45 to 7.15 minutes per customer.
- 7.8 At individual line level, 7 of 10 lines showed an improvement in Excess Journey Time, most notably the Central line, which recorded a 21% improvement on 2000/01 performance, mainly due to the introduction of Automatic Train Operation.
- 7.9 The Circle and Piccadilly lines were the least reliable in 2001/02; this is illustrated in the chart below which shows the effect of cancelled trains on reliability.<sup>28</sup>

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<sup>27</sup> LUL Performance Report to the Rail Transport Advisory Panel, date xxxx.

<sup>28</sup> London Underground, additional written evidence 28<sup>th</sup> June 2002.



- 7.10 Poor performance on the Circle Line in part reflects its character: the line shares tracks with the District, Metropolitan and Hammersmith & City Lines. The Circle Line service is particularly vulnerable to disruption because any delays on the lines with which it shares tracks will affect the service. When delays do occur therefore, London Underground cancels trains on the Circle service to minimise the effects on other lines.
- 7.11 The Piccadilly Line is also one of the poor performing lines. Again part of this relates to the characteristics of the line, for example there are fewer central area crossovers and sidings on the Piccadilly, which limits recovery from delays. Staff absences and faulty trains have played a part, but signalling capacity presents a real constraint, particularly given the massive increase in demand (25% in the last 5 years) which has caused increased dwell times (time spent at stations while customers alight and board). As a consequence, the schedules are not being met.
- 7.12 Reliability also varies between different sections of the same line. Capital Transport Campaign notes that the performance of low frequency services on the outer sections of the network has deteriorated markedly within the last few years.<sup>29</sup> In the third quarter of 2000/01 only 65% of trains departed on time or within 5 minutes of the scheduled time as against 81% in 1996/97, 84% in 1994/95 and 86% in 1992/93. This poor performance is of particular concern to the Committee.

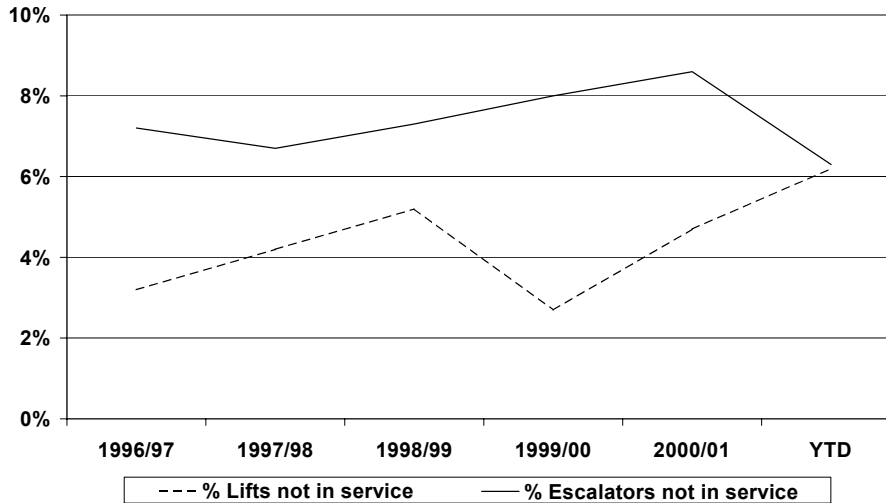
### Reliability of Escalators and Lifts

- 7.13 It is not just time spent on the train itself which affects passengers' perceptions of their journey. The reliability of the escalators and lifts they use to get to and from the trains themselves also determine the performance of the system as a whole.
- 7.14 London Underground's escalator stock is varied, with many of the escalators dating back to the 1920s and 1930s. Although modernised, the Northern Line

<sup>29</sup> Capital Transport Campaign, written evidence 17 September 2001.

in particular has elderly escalators - the first modern escalators installed in 1924 at Clapham Common are still in service. The new Jubilee Line stations are notable for provision of escalators on an unprecedented scale compared with the rest of the network. As with escalators, London Underground's stock of lifts is also somewhat varied, consisting of both traditional, pre-escalator lifts and modern lifts installed for the mobility impaired.

### Escalator and Lift Reliability



Source: London Underground Limited

- 7.15 The figure above shows recent trends in escalator and lift reliability. While lift reliability levels have historically been better than those for escalators, the average percentage of lifts out of order has risen in recent years. When evaluating escalator and lift reliability statistics, it is important to note that at any one time, there will always be some escalators and lifts out of service for maintenance.
- 7.16 The improvement in escalator reliability over the past year can be interpreted as due to the Jubilee Line Extension, which has greatly increased the number of new escalators on the system. These escalators (procured under new contractual arrangements placing more responsibility on the suppliers) have much higher reliability rates than is found elsewhere on the Tube system - although these themselves were out of action for some weeks following the discovery of cracks in the structure. Overall however, there is no evidence therefore of a genuine underlying improvement in escalator reliability elsewhere on the network.

### Delays Due to Signalling, Trains, Staff and Track Faults

- 7.17 London Underground's figures show that for 2000/01 there were 2,860 delays of over 15 minutes and more than 44,500 delays of 2 minutes.
- 7.18 While the shorter delays will include non-attributable reasons such as passenger action, the longer delays will more often reflect serious infrastructure faults. This section of the Report deals with the longer delays and looks at where Londoners can expect improvements in the future.

## Signalling Delays

- 7.19 The table below shows delays caused by problems with signalling. The most interesting finding is that the lines with the newest signalling systems (Jubilee and Central Lines) are not significantly better in performance than the other lines. In contrast the Northern Line, which is one of the two lines scheduled for the next resignalling schemes by LUL has consistently the best performance on the Tube System.

### 15 Minute Delays Caused by Signalling<sup>30</sup>

Line	Kilometres Travelled Per Delay	
	2000/01	2001/02
Bakerloo	55,946	34,043
Central	126,458	103,171
District	81,899	50,124
Jubilee	84,209	56,859
East London	32,944	21,118
Northern	230,635	185,663
Piccadilly	218,284	133,263
Victoria	167,864	156,028
Metropolitan	46,120	22,670
Circle & Hammersmith	46,646	40,438
Waterloo & City	29,779	22,907
<b>London Underground Average</b>	<b>95,952</b>	<b>62,131</b>

- 7.20 From these figures it is possible to calculate that, on average, the signalling system on each kilometre of the network causes a delay of at least 15 minutes about once every six months.

### Delays Due to Rolling Stock

- 7.21 As with the signalling system, delays by line vary considerably, however these delays are possibly more easily understood by the variation in type of trains, whereas most lines share a similar type of signalling system. The table below sets out the average distance travelled for every 15 minute delay caused by rolling stock.

<sup>30</sup> NERA final report, Table 6.4 shows more detail.

## 15 Minute Delays Caused by Rolling Stock<sup>31</sup>

Line	Train Kilometres Operated per Delay	
	2000/01	2001/02
Bakerloo	68,957	73,577
Central	40,420	34,390
District	202,887	221,514
Jubilee	214,596	138,305
East London	43,925	50,683
Northern	415,143	469,619
Piccadilly	303,173	220,936
Victoria	270,448	138,691
Metropolitan	67,130	103,276
Circle & Hammersmith	78,853	74,929
Waterloo & City	13,235	91,628
<b>London Underground Average</b>	<b>109,825</b>	<b>104,432</b>

- 7.22 It is apparent that the most consistently reliable trains are the "1995" stock on the Northern Line, which have been procured under the new form of contract, indicating the potential of the incentives. However, the "1996" stock for the Jubilee Line is practically identical, was constructed simultaneously by the same builder and is procured in a similar manner and yet causes almost twice as many delays per train kilometre. A more detailed breakdown of the figures would be required to understand the reasons behind this.
- 7.23 The Central Line and Waterloo & City Lines also share identical rolling stock, but it is harder to draw conclusions since the small size of the Waterloo & City fleet leads to considerable fluctuations in the reliability figure. Nevertheless although these comprise the third newest stock on the Underground, they appear to be the least reliable by a substantial margin. Apparent reliability rates more than ten times worse than the equivalent Northern Line stock need to be explained.

### Delays Due to Track Faults

- 7.24 Track faults tend to be less frequent than operational incidents, rolling stock and signalling faults, however there is a very considerable variation for each line over time.
- 7.25 The figures below show that there has been a clear deterioration in the past year, with the number of 15 minute delays caused by track faults having increased by nearly 50 per cent.

<sup>31</sup> NERA final report, paragraph 6.332 contains more detail.

## 15 Minute Delays Caused by Track Faults<sup>32</sup>

Line	Train Kilometres Operated per Delay	
	2000/01	2001/02
Bakerloo	89,853	50,686
Central	553,252	340,463
District	194,066	196,198
Jubilee	739,165	301,018
East London	219,624	126,706
Northern	384,392	498,970
Piccadilly	341,069	279,852
Victoria	811,344	288,051
Metropolitan	208,333	160,256
Circle & Hammersmith	97,407	60,656
Waterloo & City	119,117	183,257
<b>London Underground Average</b>	<b>269,223</b>	<b>194,775</b>

- 7.26 Once again the relatively good performance of the Northern Line is apparent, indicating the effectiveness of the “patching up” operations that London Underground have undertaken while waiting for the proposed route modernisation. The effectiveness of the extensive track reconstruction in the central tunnelled sections as a part of the Central Line route modernisation programme is also clear.
- 7.27 The consistently poor performance of the Bakerloo, Circle and Hammersmith Lines is equally evident, being twice as poor as the next worst line by any measure and is a reflection on the old infrastructure on these lines. Once again the relatively poor performance of the sub-surface lines is apparent.
- 7.28 These figures show that, on average, each kilometre of London’s Underground network results in a failure causing a delay of at least 15 minutes about every eighteen months or, another way, there are over 20 such delays on the system each month. However, track defects can also cause other problems such as speed restrictions that impose some delays on services, and deterioration in ride quality and also in passenger comfort.<sup>33</sup>

### Delays Due to Staff Absence

- 7.29 Again there appears to be considerable variations between lines for delays caused by staff absence. Underlying figures for all lines show considerable variations throughout the course of a year but are less in the summer months than in the winter months and early spring. The reason for this is not clear, but may be related to staff sickness patterns. The figures deteriorate over the two years of information provided to the Committee.<sup>34</sup>

<sup>32</sup> NERA final report, paragraph 6.3.5 and Table 6.7 show more detail.

<sup>33</sup> London Underground, evidentiary hearing 16<sup>th</sup> May 2002.

<sup>34</sup> NERA final report, paragraph 6.3.4 and Table 6.6 show more detail.

- 7.30 The large variation between lines suggests that staff resourcing and deployment requires urgent management attention. London Underground told the Committee that poor staff attendance had been a source of unreliability, particularly in 2001/02 when peak train cancellations due to unavailability of staff reached a high of 180 per week. Since then, improving staff availability has been central to improving reliability. London Underground set a target of reducing peak cancellations to 30 per week across the entire network. This was achieved in June 2001 and maintained since – and in one week in May 2002 there were no peak cancellations for the first time in two years.<sup>35</sup> Some reports attribute this performance to an increasing number of women recruits, the number of women drivers having increased by 76 per cent between 2000 and 2001.<sup>36</sup>
- 7.31 London Underground have since developed a predictive model which helps it understand, at depot level, the effects of timetable changes, training requirements and other factors affecting reliability and Performance Help Teams have been set up to assist local managers in delivering higher levels of staff reliability. London Underground accepts that although there are specific issues relating to the various lines and depots, all lines and depots should achieve the standards of the best performers.

### **International Comparisons**

- 7.32 Again, the comparator systems have different ways of measuring reliability. However they do give some interesting insights into more appropriate ways of recording reliability and also some potentially different ways of benchmarking future London Underground performance.
- In New York the key measure of reliability is now “Wait Assessment” which is the percentage of peak hour trains which are no more than two minutes late (or four minutes in the off peak).
  - In Stockholm train cancellations have fallen to around 0.5 per cent even on the oldest lines
  - In Madrid, where a minimum number of train hours are set, a 99.5 per cent peak hour service was achieved in 2000

*NERA report page 50.*

Compared to the other cities examined as part of the present study, London Underground performs relatively poorly in terms of reliability.

### **LUL Journey Delay Refund Policy**

- 7.33 There is a financial cost to LUL for aspects of the unreliability of the service. London Underground operates a policy of refunding passengers for some delays to journeys which exceed 15 minutes. Refunds do not apply to delays caused by “freak weather”, security alerts, scheduled engineering work, action by third parties, or any situation that would prevent the safe running of the service. Refunds are also not available when they have publicised in advance an

<sup>35</sup> London Underground, supplementary written evidence, 28<sup>th</sup> June 2002.

<sup>36</sup> London Evening Standard, 6<sup>th</sup> June 2002, The Observer 16<sup>th</sup> June 2002, BBC News 18<sup>th</sup> June 2002  
<http://news.bbc.co.uk/1/hi/uk/2049167.stm>



alternative route - for example because of planned engineering works. In the event of industrial action, special conditions apply.<sup>37</sup>

### **What Can Londoners Reasonably Expect?**

- 7.34 The reliability of the Underground system is one of London's key concerns and this is particularly important given that they pay more to use the Underground than any of the other comparator systems.<sup>38</sup>
- 7.35 London Underground's plans for investment over a thirty-year period show the following improvements which should deliver a more reliable system, such as:
- The installation of "modern signal and control systems" on all lines by 2019;
  - Renewing the signalling on all lines other than the Central and Waterloo & City;
  - Replacement of all rolling stock that is currently more than 10 years old by 2019 with the bulk being replaced between 2008 and 2014;
  - 320 kilometres of track to be replaced by 2033.
- 7.36 London Underground have already invested in improvements which have resulted in measurable increases in reliability such as the Northern Line signalling, Central Line track, new procurement measures for rolling stock and escalators and better management procedures to improve staff availability. **This improvement is continuing, the Committee was pleased to note that London Underground reliability statistics it received for the first four week period of 2002 /03 are the best for over two years.**<sup>39</sup>
- 7.37 Our Report shows that there is still a considerable way to go and it is the view of the Committee that users of the London Underground should be able to demand, and receive, a more reliable system than that which is currently on offer.
- 7.38 The Committee believes that TfL should urgently address the need to improve the reliability of the system, in the first instance to levels achieved in the early 1990s and then still further. Our consultants have calculated that, based on the best performing lines, it would be reasonable to expect to achieve a 30 per cent reduction in delays of more than 15 minutes within five years.<sup>40</sup>

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<sup>37</sup> London Underground: <http://www.tubeplanner.com/refunds.shtml>

<sup>38</sup> NERA final report, section 13 details comparative fare levels between the Tube and other systems.

<sup>39</sup> London Underground, evidentiary hearing 16<sup>th</sup> May 2002.

<sup>40</sup> NERA technical note – London Underground Performance Targets, January 2003.

**Key Recommendation 3**

**The number of delays exceeding 15 minutes must be reduced by 30% to match that of the best performing lines on the network within five years of the Underground being handed over to Transport for London.**

*Supplementary Recommendation 3a*

TfL should set out targets for improving the reliability of service for each line. These published targets should be understandable to the travelling public and the system of refunds for delays should be more actively published.

*Supplementary Recommendation 3b*

TfL should publish figures on the causes of poor reliability for each line.

*Supplementary Recommendation 3c*

TfL should demonstrate how they intend to spread best practice from the best performing lines in areas such as staff availability and train regulation.

## 8 Improving Safety and Security for Underground Users

*Safety does not appear in London Underground's Customer Service Delivery Standards because it is "taken as read" that the requirements of the Health and Safety at Work Act to identify risks and take all reasonable steps to control them takes precedence over any other measure.<sup>41</sup> Nevertheless, this section deals with the safety of the Underground and passenger security – London Underground's stated key priority as well as that of Tube users themselves.*

- 8.1 It is important to make a distinction between safety and security issues. In this Report "safety" is used to refer to incidents and accidents involving trains and lifts and escalators and "security" which deals with a range of criminal activity ranging from graffiti and thefts to serious violent incidents.

### Safety on the Underground

- 8.2 London Underground told the Committee that they are proud of their safety record. There have been no passenger fatalities, due to an accident involving a train, for over 25 years. The last one was at Moorgate in February 1975 where over 40 people died.<sup>42</sup> It should be noted that despite this good safety record there clearly are risks on the Underground as we have sadly seen with the Chancery Lane derailment. London Underground's priority is to keep those risks as low as is reasonably practical and we expect TfL to confirm this will remain the case.

#### Key Recommendation 4

**That the Mayor of London, as Chair of TfL, appear before the Assembly's Transport Committee within three months of taking control of the Underground to make a statement defining TfL's strategy for safety on the Tube.**

#### NERA report section 5.2.1

Unlike mainline rail, all London Underground lines are provided with mechanical systems that automatically apply an emergency brake if a train passes a signal at danger (SPAD). If the train protection system is activated, an automatic speed control system is also activated. The Victoria and Central lines have Automatic Train Protection (ATP) systems, which in addition to the train-stop facility also protect against exceeding speed limits. The provision of these systems means that the risk to passenger safety associated with a SPAD is low.

- 8.3 London Underground is required by the Health and Safety at Work Act to produce and regularly revise a "safety case" demonstrating that it has identified the risks arising from operating its service and taken all reasonable practicable

<sup>41</sup> London Transport Users Committee, written evidence October 2001

<sup>42</sup> Seven people were killed on the Underground in accidents in 2000/01 but none of these involved a train incident.

steps to control them. Currently the five largest areas of risk are on the platform/rail interface, derailments, collision between trains, station area accidents and flooding.<sup>43</sup> Flooding was until recently much the largest element of risk but this has been radically reduced by work undertaken on the tunnels beneath the Thames.<sup>44</sup>

8.4 The following figures from London Underground illustrate accidents and incidents on the system in 2000/01:

Passenger accidental fatalities	7
Employee/contractor fatalities	0
Passenger major injuries	135
Employee/contractor major injuries	7
Signals passed at danger	863
Person-train incidents	1168
Incorrect Door Openings	36

8.5 Although incorrect door openings are included in the safety statistics (i.e., doors opening when a train is not at rest at a platform) there have been no fatalities and only one injury per year arising as a result of this over the past three years.

8.6 According to London Underground, currently the biggest single risk on the Underground is that arising from boarding and alighting from trains, the cause of a number of fatalities in a typical year.<sup>45</sup> One action taken has been to fit inter-car barriers to prevent passengers from falling or stepping into the gap between cars when a train is at rest. Another is to paint yellow lines on platforms, and advise passengers to stand behind them when a train is approaching. There is concern that overcrowding on platforms could increase the risk of passengers falling onto the line, although London Underground indicated that they were not aware of any crowding incident where people have been crushed or fallen onto the track as a result.

8.7 London Underground are also looking into the possibility of extending use of platform edge doors, as fitted on the Jubilee Line Extension, but there are technical difficulties.<sup>46</sup>

*NERA report, section 5.2.1*

The very low probability of a serious injury or fatality occurring can be illustrated by the fact that based on the figures available, a passenger making ten Underground trips a week, every week of the year for forty years would have a 0.015 per cent chance of being killed by an operational accident, and a 0.3 per cent chance of suffering a serious injury.

<sup>43</sup> London Underground Ltd, Railway Safety Case Version 3.00, 1<sup>st</sup> October 2001.

<sup>44</sup> London Transport Users Committee, written evidence October 2001.

<sup>45</sup> London Underground, evidentiary hearing 16<sup>th</sup> May 2002.

<sup>46</sup> London Underground stated at the hearing on 16<sup>th</sup> May 2002 that there are no currently available designed platform edge doors that will work on a curved platform.

## International Comparisons

- 8.8 There is only one common safety indicator among the international comparator systems, and that is the total number of fatalities as a proportion of total passenger journeys. In 2000 London ranked sixth out of the nine comparators. This could suggest an average performance, however it is important to note that this particular measure shows only one extreme measure of safety, which does not distinguish between suicides and accidental deaths.

## What Can Londoners Reasonably Expect?

- 8.9 The Committee welcomes the recent safety record on the Underground and the continuing fact that safety is the highest priority of all who use, work on and manage the Underground. Londoners should reasonably expect a high level of safety on their system and that the currently good level of safety is maintained. Public confidence in the system must not be diminished.
- 8.10 **Safety does not feature in London Underground's published list of Customer Service Delivery Standards because it is taken as read that the requirements of the safety case and the objectives of their safety plan take precedence over any other measures. There are therefore no published standards.**
- 8.11 There are concerns that as the system becomes more overcrowded the risks involved to passenger safety will increase. London Underground has assured the Committee that each station has its own evacuation plan and procedures to deal with the dangers of overcrowding. However there are some relatively simple measures, such as the better marking of the edges of steps and escalator treads, which can be implemented at low cost.

## Security on the Underground

- 8.12 There were 14,278 crimes on the Underground in 2001/02 which represents a 0.6 per cent fall in crime levels on the previous year. This can be compared with an increase of 7.4 per cent in the British Transport Police crime figures for England and Wales overall. The previous year saw a 21 per cent decline in crime levels on the Underground compared with a national figure of 3 per cent. Current figures however are still higher than those recorded in 1998/99 (13,035).<sup>47</sup>

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<sup>47</sup> British Transport Police, Annual Report, July 2002.

### Proportion of Crimes by Type on London Underground (1999 - 2002)

	1999 -2000	2000 -2001	2001 -2002
Violent Crime	9%	10%	10%
Sexual Offences	2%	3%	2%
Criminal Damage	4%	5%	5%
Line of Route Offences	0%	0%	1%
Theft of Passenger Property	63%	59%	54%
Motor vehicle/cycle offences	6%	8%	7%
Robbery	4%	4%	5%
Theft of Railway Property	4%	3%	7%
Public Disorder Offences	3%	3%	2%
Fraud Offences	1%	1%	1%
Drugs	1%	1%	3%
Other Crimes	4%	3%	2%
<b>Total Crimes</b>	<b>18,131</b>	<b>14,370</b>	<b>14,278</b>

*NERA report, section 5.2.2*

About three million people use the Tube each day, but there are fewer than 40 crimes a day reported. The low risk of being a victim of crime on the Underground is illustrated by the fact that a passenger using the Underground ten times a week, every week of the year for forty years, has roughly a one in four chance of being a victim of crime once in that period, with over half of that probability being the chance of a theft of personal property.

### Public Attitudes and Expectations - Crime and Security

- 8.13 London Underground consumer surveys show that passengers attach a very high priority to improvements to security measures. LUL "willingness to pay" surveys reveal improved security as the aspect that consumers would be willing to pay most to improve. Customers express a particularly high willingness to pay for surveillance cameras on trains, a greater staff presence on platforms and the provision of help points in walkways.
- 8.14 Written evidence received by the Committee from consumer groups suggests that passengers generally feel safe and secure. However, consumer groups also note that perceived risk of crime amongst passengers is higher than actual risk. There is a difference between men and women on this issue, with women generally feeling less secure and attaching a higher priority to improved security measures.

- 8.15 Help Points are available at London Underground stations, providing a direct link to a member of staff, plus a fire alarm. The Committee received evidence that drew attention to the fact that a relatively large proportion of Help Points are non-operational<sup>48</sup> and are not easily accessible for those in wheelchairs, or those with impaired hearing or vision.<sup>49</sup>
- 8.16 There was also evidence from an organisation to suggest that passenger awareness of the availability of fire alarms and Help Points on platforms is quite limited, and it suggested that visibility of these be increased.

### **The British Transport Police**

- 8.17 The British Transport Police (BTP) is the national police force for the railways providing a policing service to railways throughout England, Wales and Scotland. The Force is also responsible for policing the London Underground system, the Docklands Light Railway and Croydon Tramlink.
- 8.18 The London Underground Area of British Transport Police employs 405 police officers and 58 civilian staff. In 2000/01 the Underground was responsible for 20.5% of BTP's reported notifiable crimes
- 8.19 Crime Concern told us that there is some confusion over the boundaries between areas served by British Transport Police, and by the Metropolitan Police, including who is responsible for what. They also pointed to the inability of BTP to make a "rapid response" to crimes in most cases, due to the small number of officers available.<sup>50</sup>
- 8.20 BTP were invited but were unable to attend the Committee's hearings. London Underground stressed the value of a police force that understands how the system works (e.g. the risks involved in pursuing suspects through tunnels). *"We are very impressed and pleased with the performance of the British Transport Police in relation to the Underground"*.<sup>51</sup> However, one concern is response times, especially outside Central London, though in these areas the BTP will often call upon officers from the Metropolitan Police or from county forces.

### **London Underground Security Initiatives**

- 8.21 London Underground has taken a number of initiatives to try and improve security on trains and in stations in recent years. Examples include the installation of CCTV in stations, covering ticket halls and walkways as well as platforms. London Underground is currently in the process of introducing CCTV cameras to its trains, and aims to equip all its new trains with CCTV.
- 8.22 London Underground report that following the introduction of a new control room at Ladbrooke Grove, linked to CCTV cameras, there was a 60 per cent reduction in total crimes.

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<sup>48</sup> Capital Transport Campaign, written evidence 17<sup>th</sup> September 2001.

<sup>49</sup> Greater London Action on Disability, written evidence September 2001.

<sup>50</sup> Crime Concern, evidentiary hearing 31<sup>st</sup> January 2002.

<sup>51</sup> London Underground, evidentiary session 16<sup>th</sup> May 2002.

- 8.23 Crime Concern and BTP have operated a Secure Stations Scheme since 1998 under which individual stations can receive accreditation if they meet certain security standards and have satisfactory results from a customer security survey. The accreditation lasts for two years, after which, re-accreditation must be sought. Only 4.5 per cent of stations have achieved accreditation and the Committee received evidence that expanding the scheme to other stations, and even to the trains themselves would be desirable. London Underground however question whether the money to achieve further accreditation may be better spent on actual security measures themselves.

### **International Comparators**

- 8.24 International comparison is difficult since there is no common measurement of crime or fear of crime.

### **What Can Londoners Reasonably Expect?**

- 8.25 Evidence provided by LTUC suggests that customers generally feel both safe and secure when travelling on the London Underground. This is mirrored in London Underground's own Customer Satisfaction Survey, where customers awarded personal safety on trains one of the highest levels of satisfaction out of all the elements surveyed.
- 8.26 People feel generally safe on the Underground but this perception varies with gender, location and time of day. There are concerns over the number of staff who are visible to those using the system. However, it is worth noting that the Underground currently employs more staff per station than for mainline railway stations and for many other metro stations across the world.<sup>52</sup>
- 8.27 Londoners can reasonably expect that the Underground system remains relatively safe compared with other public transport systems. The level of crime and fear of crime should decrease as investment in CCTV on trains and help points at stations is increased and staff are freed up from ticket office duties to become more visible on platforms.
- 8.28 **The Committee believes that London Underground should provide more information to users of the system on aspects of safety, particularly to address the issues raised by fear of crime on the Underground.**

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<sup>52</sup> NERA final report paragraph 5.4.1.



**Key Recommendation 5**

**TfL should aim to demonstrate an improvement in customer satisfaction ratings of not less than 10% between 2003 and 2008 with regard to safety and security on trains and stations.**

*Supplementary Recommendation 5a*

That TfL publish information on a regular basis to allow monitoring of:

- CCTV in train carriages, platforms, ticket halls and walkways
- Fully operational help points
- Stations which are staffed during opening hours
- Staff available outside ticket halls during opening hours

*Supplementary Recommendation 5b*

That TfL demonstrates that it has reviewed how it manages shift patterns and staff locations in order to maximise staff availability across the whole network including late at night.

**Key Recommendation 6**

**That British Transport Police and Metropolitan Police comment on current staffing levels dealing with crime on the Underground and the justification for maintaining a separate Transport Police. They are also requested to report on the issues in terms of co-ordination between the two forces which need to be addressed to ensure that personal security is improved.**

*Supplementary Recommendation 6a*

The Mayor of London should press the case for seriously examining the possibility of merging the British Transport Police in London with the Metropolitan Police.

## 9 Providing a Cleaner and More Pleasant Travelling Environment

*Another key priority for customers is the state of the travelling environment. People want cleaner trains and stations and a more comfortable journey. This section reviews what improvements London Underground is proposing in line with passenger expectations.*

### Cleanliness of Stations and Trains

- 9.1 London Underground Customer Satisfaction Surveys shows cleanliness to be an area where there are low levels of current satisfaction. For example, the Customer Satisfaction Survey for 2000/01 shows cleanliness to be one of the areas that customers are currently least satisfied with, particularly cleanliness on trains.
- 9.2 London Underground have currently undertaken a number of initiatives to try and improve cleanliness. Examples include publicity campaigns encouraging passengers to dispose of litter appropriately and the use of full-time station cleaners during peak hours at major stations.
- 9.3 London Underground currently aims to keep both stations and trains free from litter by collecting and disposing of litter “at frequent intervals”, but actual standards achieved sometimes fail to meet these levels, and “frequent intervals” are not precisely defined. One of the key difficulties raised in this area are the problems involved in ensuring that train cleaning teams are available at the right place at the right time when trains are turned round.<sup>53</sup>
- 9.4 As a part of the proposed PPP performance regime LUL has formulated statistical methods of measuring cleanliness and has been keeping records of the resultant trends. This information has not been made available to the Committee on the grounds of commercial confidentiality.
- 9.5 As far as graffiti is concerned, London Underground’s CSDS State that “trains, stations and trackside structures must be kept free from graffiti. A train vandalised with graffiti should not be allowed to leave the depot.” (except in the case of scratched glass graffiti). However, it is not clear London Underground monitors adherence to these targets.

#### **Cost of Graffiti to London Underground**

A London Assembly Report “Graffiti in London” found that London Underground spends £2,500,000 annually on removing graffiti and estimates that it would cost an additional £8-10 million to replace all etched glass on the trains and hundreds of millions more to remove trackside graffiti and replace etched interior panels on the trains.<sup>54</sup>

<sup>53</sup> Note that not all lines have turn-around points – for example the Circle line and the Piccadilly line Heathrow loop.

<sup>54</sup> Graffiti in London, Report of the London Assembly Graffiti Investigative Committee, May 2002, page 16.

[http://www.london.gov.uk/approot/assembly/graffmtgs/Graffiti\\_all.pdf](http://www.london.gov.uk/approot/assembly/graffmtgs/Graffiti_all.pdf)

## **International Comparisons**

- 9.6 A direct comparison of cleanliness between London and the comparator cities is not possible due to data availability problems and differences in the definitions used. However, the Committee noted the quality and quantity of information contained in the quarterly Passenger Environment Survey in New York, and the fact that the results of this survey are always published.<sup>55</sup>

## **What Can Londoners Reasonably Expect?**

- 9.7 Current levels of satisfaction with cleanliness record some of the lowest scores out of all measures included in London Underground's Customer Satisfaction Survey. Increasing cleanliness on trains and stations has been identified as a particular customer concern and therefore a priority for improvement.
- 9.8 While LUL monitors customer satisfaction with the cleanliness of trains and stations on a regular basis, the Committee has not found any evidence of similar, *regular*, monitoring of factors such as litter levels and graffiti levels, nor specific, well defined targets for actions such as "regular cleaning". Evidence of extensive monitoring of graffiti, litter and vandalism levels in New York in particular suggest that more must be done to monitor TfLs progress in these areas.
- 9.9 As with reducing staff absenteeism (sections 7.29 – 7.31 above), improved standards of cleanliness is another area where management action can quickly produce improvements by ensuring best practice across the system since this will not require major capital expenditure. Londoners can reasonably expect that this should be done.

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<sup>55</sup> NERA Final Report details the New York Passenger Environment Survey in Appendix D of the report.

### **Key Recommendation 7**

**TfL should aim to demonstrate an improvement in customer satisfaction ratings of not less than 10% between 2003 and 2008 with regard to cleanliness on trains.**

#### *Supplementary Recommendation 7a*

That TfL introduce and publish a quarterly survey covering information relating to litter, cleanliness of trains and stations and graffiti as contained in the quarterly Passenger Environment Survey in New York.

#### *Supplementary Recommendation 7b*

That TfL should publish the standards and statistical methods of measuring cleanliness it has developed under the PPP contracts so that the travelling public can understand what levels of improvement in this area can be expected

#### *Supplementary Recommendation 7c*

That TfL should increase the number of on-train cleaners particularly before and after peak hours to ensure that trains are kept as clear of litter as possible without returning to the depot

## **Passenger Comfort**

- 9.10 Passengers want to travel in relative comfort. Overcrowding and the smoothness of the journey (through better tracks and better driving) are only two factors which influence the comfort of the passenger. The high temperatures experienced by passengers on board trains, particularly during the hottest days, is a continuing cause of concern to the users of the system, and one which is made worse by overcrowding and trains being stopped in tunnels for even the shortest period. A serious incident on the Victoria Line at Highbury and Islington in July 2001 demonstrated the dangers that high temperatures on the Tube pose.<sup>56</sup>
- 9.11 The Committee received a considerable amount of evidence that commented on the desirability of air conditioning or some kind of temperature control on the Tube system.

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<sup>56</sup> The incident happened when three Victoria Line trains were stopped in a tunnel outside Highbury and Islington station, on a hot summer's day in July 2001. Passengers were stuck on the trains for 90 minutes in sweltering conditions and about 600 people had to be treated for heat problems. Eighteen passengers were so badly affected they had to be taken to hospital.

### **Air Conditioning on the Underground**

The following is an extract from London Underground's website explaining issues surrounding improved ventilation and temperature control on the Tube.

"Air conditioning is often mentioned as a potential solution. True air conditioning is not really practical on an underground system, because of the problem of dissipating the heat produced. Tunnels can become dangerously over-heated, even leading to a fire hazard, and the temperature on platforms is likely to soar.

Part of the problem in installing air conditioning on the Tube would be the size of the unit that would be required for each carriage. Railway systems in other countries have been able to adopt air conditioning in recent years because tunnels were built big enough to carry the units.

London Underground is the oldest in the world - dating from 1863 - and most of our infrastructure was designed in an era when little thought was given to this area. The tunnels were only designed with enough room for trains, let alone air conditioning units.

Ventilation in the trains is basically created by the trains themselves as they pass through tunnels. The most efficient circulation of air is provided through the end windows in each car."<sup>57</sup>

- 9.12 London Underground have, however stated that within ten years there will be new trains on parts of the surface and sub-surface system the network that will have comfort cooling. These will not, however, make a fully loaded train feel cool. "While London Underground are researching new technology for improving cooling on trains and stations they have not yet found an economic proposition to make any difference on the deep tube section of the network."<sup>58</sup>

### **What Can Londoners Reasonably Expect?**

- 9.13 Despite these improvements, passenger views, articulated through the London Transport Users Committee, emphasise that this will remain a priority issue for passengers. "Much of the Underground was built in the era of the horse bus. Standards of comfort provided on other transport modes have risen dramatically since then, and it is not acceptable for the Underground to lag behind indefinitely."<sup>59</sup>

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<sup>57</sup> <http://www.thetube.com/content/faq/tipsac.asp>

<sup>58</sup> London Underground, evidentiary hearing 16<sup>th</sup> May 2002.

<sup>59</sup> London Transport Users Committee, written evidence October 2001.

**Key Recommendation 8**

**Transport for London must present plans and costed options for cooling trains within a year of control of the Underground passing to their management.**

*Supplementary Recommendation 8a*

That TfL re-evaluate the importance that customers place on an adequate comfort cooled journey in the deep Tube lines and use this in any economic assessment of potential cooling measures on the system in the future.

*Supplementary Recommendation 8b*

That cooling system manufacturers and other organisations be asked to comment on potential solutions to the issue of air conditioning on the Underground.

## 10 Information Provision and Customer Care

*This section deals with information provision, customer care, the availability and helpfulness of staff.*

### Information Provision

- 10.1 Evidence received from passenger groups and the results of passenger surveys show that Underground users' satisfaction with the provision of information is generally high, particularly for "static" information such as maps and signage, both at stations and on trains.
- 10.2 Customers are less satisfied with the provision of "dynamic" or "real time" information. Those providing evidence welcomed dot matrix displays, and station and train announcements. Suggestions for how London Underground might further improve performance include:
- More consistent use of on-train announcements, particularly when there are delays. Respondents remarked that some drivers already do this very well, and that extending the practice to all drivers would improve things further;
  - Improved use of the PA system at stations, particularly for providing real-time information. PA announcements are sometimes inaudible and that staff might benefit from better training on how to speak more clearly over the PA system;
  - More regular updates to "real time" information on service delays presented on whiteboards and dot matrix displays, for example, in ticket halls;
  - In some cases dot matrix displays are not readily visible due to, for example, other signs obstructing the view, or due to their location at one end of the platform only.
- 10.3 The provision of adequate information was a particular issue raised by many of the representatives of groups with disabilities. This Report will cover initiatives to improve information provision for these groups in particular in the Accessibility section below.

### London Underground Customer Service Standards

- 10.4 London Underground have a number of relevant standards covering the form and content of information on the system. Customers must be provided with information that is timely, accurate and informed, clear and concise.<sup>60</sup> Standards that customers should expect include:
- Clear audible information on all parts of stations and trains
  - Clear, easy to read and consistent signs
  - Readily available printed information, including maps, customer charter information and ticketing and interchange information

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<sup>60</sup> London Underground, written evidence, September 2001

- Available and helpful staff (some of whom are fluent in foreign or sign languages) with adequate knowledge of the Underground and local area, who can provide assistance in finding alternative routes should service disruption occur.

### **International Comparisons**

- 10.5 The CoMET database does not include specific indicators for information provision and the Committee was unable to access any relevant information from the comparator systems except New York. The New York system has information provision aspects within its Passenger Environment Survey (as summarised in chapter 7) and includes specific indicators measuring the quality of information provision in its trains and stations. These are:
- Cars with all system maps correct/legible;
  - Cars with all signage correct;
  - Cars with public address announcements;
  - Stations with legible and correct system maps;
  - Stations with correct Passenger Information Centre;
  - Stations with control areas with a correct subway map available; and
  - Station delay announcements: understandable and correct.

### **London Underground Proposals**

- 10.6 At the evidentiary hearing on 16<sup>th</sup> May 2002 London Underground stated that information provision was a current priority for improvement. London Underground appreciate that the provision of dot matrix indicators and sustained efforts to improve the public address system to advise customers of problems on the Underground and to offer information to minimise the length of their journeys have been welcomed by the public.
- 10.7 London Underground are still not satisfied that information is adequate and are using internal benchmarking to improve this across the system. “There are some staff and some places where information given to customers is much better than in other places. We are determined to level up to best practice throughout the network”.<sup>61</sup>
- 10.8 London Underground are just about to launch a new programme to try and make an improvement in information provision without any reliance on improved technology and have a longer term project to improve information dissemination through technological means over the coming years.

### **What Can Londoners Reasonably Expect?**

- 10.9 Satisfaction with “static” forms of information is already high on London Underground and these good standards must be maintained.
- 10.10 However there are problems with the provision of dynamic information to keep passengers informed of current system problems. This is important as it allows

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<sup>61</sup> London Underground, evidentiary hearing 16<sup>th</sup> May 2002



customers to make informed choices about whether to vary their intended journey.

- 10.11 There are a number of initiatives that London Underground could take to improve dynamic information, including greater consistency in the standards of announcements on trains and in stations, and ensuring that real time information is kept as up to date as possible. In their evidence at the final hearing, as referred to above, London Underground indicated that information provision was one of the two areas (the other being reliability) where they were most unhappy with their present performance.
- 10.12 This is much to be welcomed and Londoners should expect immediate improvements in the information they receive as they make their journeys, and especially for those particular journeys (but hopefully fewer ones) where problems are experienced.

### **Customer Care**

- 10.13 London Underground Customer Satisfaction Surveys shows customer care, in the form of staff available when needed, records the lowest satisfaction score of all questions asked. Of 22 aspects of London Underground's services "help and appearance of ticket office staff" ranks 11<sup>th</sup> out of 22, "help and appearance of staff around station" ranks 20<sup>th</sup> and "station staff visibility" ranks last.<sup>62</sup>
- 10.14 As well as assisting in reassuring customers in terms of perceptions of safety, the availability and visibility of staff, particularly on platforms can assist in better customer care. Staff available to offer help and information to passengers would benefit all passengers not just those with disabilities. The Committee has already noted that London Underground employs more staff per station than for mainline railway stations and for many metro stations elsewhere.

### **London Underground's Approach to Customer Care**

- 10.15 London Underground's Customer Charter includes:
- London Underground's aims, objectives and responsibilities
  - The responsibilities of the customer
  - The levels of service the customer can expect
  - Information on London Underground's performance
  - The means of redress through refunds, the customer service centre and the London Transport Users Committee.
- 10.16 London Underground's Customer Service Delivery Standards provide for its staff to be smartly dressed, approachable and proactive in meeting customers' needs. In the event of train delays, staff should inform customers of the cause and likely duration of the problem.

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<sup>62</sup> London Transport Users Committee, written evidence October 2001

## **International Comparisons**

- 10.17 The Committee was unable to access any relevant information on customer care standards from other metro systems.

## **What Can Londoners Reasonably Expect?**

- 10.18 Clearly the relationship between London Underground's staff and their customers is an area for much needed improvement. Users of the Underground wish to see more staff on hand on platforms and other areas of the system who, when they are asked to help, can do so in a knowledgeable and polite manner. This is another area which London Underground should be able to improve upon in a relatively short time since it does not require major capital expenditure.
- 10.19 TfL needs to develop and consult on models for future staff deployment given the changes in staffing needs that the PPP and new technology will introduce. The Committee believes that TfL should carefully consider whether taking the opportunity of using these efficiencies to cut staffing levels would run counter to the important public demands for a higher staff presence on the system.

### **Key Recommendation 9**

**That TfL reports within one year on their plans for reallocating staff freed from ticket office duties following their ticketing initiatives to duties that are more focused on providing help and information to customers.**

#### *Supplementary Recommendation 9a*

That TfL report to the Assembly the number of dot matrix information indicators on platforms which are obscured (by other signs for example) and their plans to achieve full visibility.

#### *Supplementary Recommendation 9b*

That TfL reports on their plans to extend best practice in the dissemination of real-time information to passengers on board trains, platforms, within and outside stations.

# 11 Improving the Underground's Accessibility

*The Committee received both oral and written evidence from groups representing disabled and mobility impaired passengers. This section examines London Underground's performance on a number of key areas affecting accessibility.*

## **Step Free Access**

- 11.1 The fact that many stations were designed and built long ago, the existence of deep tunnels, and space restrictions all contribute to the fact that, currently, only a small proportion of London Underground's stations can be classed as truly "step-free".
- 11.2 London Underground's current policy is to introduce step-free access at all new stations such as those on the Jubilee Line extension, and to introduce it where possible (e.g. where funds allow) at other stations when they undergo major refurbishment.
- 11.3 The evidence received by the Committee indicates that groups representing those with disabilities largely accept that complete step-free access is a long-term goal rather than one that can be attained in the short to medium term. However, passenger groups raise concerns about the fact that the stations being converted for step free access during station refurbishment are those that are "easiest" to convert, rather than those that would be particularly useful to mobility impaired passengers. It was suggested that converting a few stations at key locations in the centre of London would be more effective in increasing accessibility.<sup>63</sup>

## **Staffing Issues**

- 11.4 Several groups representing those with disabilities suggested that having more staff available to provide help, including on the platform, who are better trained in assisting disabled passengers would improve current levels of accessibility significantly. It was suggested that the current, general, disability awareness training that staff receive could be further improved with more training on how actually to assist passengers. Increased availability of staff would also reduce fear of crime by those with disabilities and the elderly, who frequently report feeling particularly vulnerable. It appears to the Committee that this again is a staff management and deployment issue which should be capable of being addressed immediately.

## **Initiatives for those with Visual and Hearing Impediments**

- 11.5 Recent years have seen a number of initiatives taken by London Underground to improve accessibility, and, particularly, safety, for those with visual and hearing impairments.
- 11.6 Examples include "doors closing" chimes, high visibility and tactile platform edge markings, barriers at the ends of platforms to help prevent passengers accidentally going onto the track, and "skirts" between train carriages to help the visually impaired distinguish these gaps from door gaps (but mainly to

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<sup>63</sup> Greater London Action on Disability, written evidence September 2001.

discourage train “surfing”). These initiatives were very much welcomed by those providing evidence to the Committee on behalf of disabled users.

- 11.7 A number of further potential improvements to information provision for those with visual and hearing impediments were suggested to the Committee. These included the provision of both visual and spoken versions of information such as announcements, station stops and train destinations. The introduction of audio information in train carriages (for example on the Central line) was welcomed by disabled passenger representatives, and a desire was expressed for these initiatives to be expanded to cover the whole system. The possibility of using platform-based PA systems, and greater use of announcements by drivers were suggested as ways in which improvements might be made in the short term.
- 11.8 Other relatively simple initiatives that could be taken in the short term include the use of tactile markings at the beginning of escalators, and the use of more colour contrast between surfaces. For example, some respondents expressed disappointment that the Jubilee Line stations have very little colour contrast.<sup>64</sup>

### **International Comparisons**

- 11.9 The CoMET database does not include specific indicators to measure accessibility to the network. London Underground’s policy of making stations accessible is broadly similar to that in most of the comparator cities, where a pragmatic approach is taken as well.
- 11.10 Only the relatively new systems in Stockholm and Barcelona will become fully accessible in the near future. In both New York and Paris, however, all buses will be fully accessible, so that they provide an alternative to the metro system.

### **Reasonable Expectations**

- 11.11 London Underground’s investment plans, and the information provided on the practical and cost implications of converting stations shows that a fully accessible Underground system is still some way off for Londoners and is highly unlikely to be achieved in anything other than the long term.
- 11.12 Evidence received from a range of parties, including LUL, disabled passenger groups and evidence from overseas has suggested that Londoners cannot reasonably expect a fully accessible system in the next 15 years.
- 11.13 However, evidence also points to a relatively large number of initiatives that London Underground might reasonably be expected to take to improve current accessibility levels. Key examples include:
- Introducing more formal, active, and early consultation with groups representing those with disabilities in the design of new and refurbished stations;
  - Improving accessibility for the mobility impaired at a selection of “key” central stations;

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<sup>64</sup> <sup>64</sup> Greater London Action on Disability, written evidence September 2001.

- Introducing a range of improvements for the visually impaired, such as improvements to signage and information boards, more tactile markings and increased colour contrasts;
- Expanding recent initiatives such as audio announcements of train destinations and station stops across the network.

11.14 At the evidentiary hearing on 16<sup>th</sup> May 2002, London Underground announced that it was about to launch a strategy for accessibility on the Underground that will be made available to the Committee.<sup>65</sup> Londoners can expect improvements in the accessibility of the Underground for the disabled and others such as those with pushchairs or cycles, but the complex nature of the system and the configuration of all but the newest stations<sup>66</sup> means that progress may seem slow and that concerns will still remain.

**Key Recommendation 10**

**That TfL report on their plans for achieving the "core accessible network" by June 2003 and any changes to funding, feasibility studies or other factors which are mentioned in "Unlocking London for All" which could result in significant delays to the step free access development plan.**

*Supplementary Recommendation 10a*

The current, general, disability awareness training that staff receive should be further improved with more training on how to assist passengers with disabilities.

*Supplementary Recommendation 10b*

The introduction of audio information in train carriages as used on the Central line should be expanded to cover the whole system. TfL should produce their plans to achieve this standard

*Supplementary Recommendation 10c*

TfL in the short-term produce a plan to improve the use of tactile markings at the beginning of escalators, and the use of more colour contrast between surfaces at all stations.

<sup>65</sup> This has now been published "Unlocking London for All", August 2002.  
[http://www.thetube.com/content/faq/unlocking\\_london/mobilitycontents.asp](http://www.thetube.com/content/faq/unlocking_london/mobilitycontents.asp)

<sup>66</sup> It is noticeable that the Underground's map which shows fully accessible stations reveals how they are clustered on the Jubilee Line Extension (and on the Docklands Light Railway).

## 12 Improving Integration

*The Underground should have good integration with other forms of transport. This section looks at what improvements could be made to aspects of physical, information and ticketing integration on the Tube system.*

- 12.1 The extent to which the London Underground achieves good integration with other modes of transport can be examined at three levels:
- Physical integration – the ease with which passengers can move from one transport mode to another. For example, whether bus stops are located close to tube stops and whether Underground timetables reflect bus and mainline train/DLR timetables and *vice versa*.
  - Information integration – how well information on different transport modes is provided, including timetables and information on the location of other transport modes.
  - Ticketing integration – the extent to which customers can switch easily from one mode to another, without having to buy a separate ticket.

### Physical integration

- 12.2 London's performance in terms of physical integration is currently quite mixed. Integration with mainline train services is generally regarded as quite good. With the exception of Fenchurch Street, all major mainline train termini have direct concourse links to Underground stations and signage on the Underground indicating mainline rail links are generally good. This also generally applies to Docklands Light Railway (DLR).
- 12.3 Physical integration between Underground and bus services is often more difficult because of physical constraints – in many cases, especially in the centre of London, the location of station exits at road junctions means that kerb-side bus stops cannot be located directly outside station entrances.
- 12.4 LTUC report that in terms of physical integration, there has been historically very little co-ordination of London Underground service planners and bus service planners, and that integration tends to be relatively poor even on more modern sites such as the Edgware interchange.<sup>67</sup> It should however be noted that London Underground has taken steps to improve signage to bus services in recent years within Underground stations, including the provision of maps showing bus stops.
- 12.5 In some cases, it has been suggested that timetable integration between transport modes might be improved. This is an issue for mainline rail operators as much as it is for London Underground and generally only applies to the periphery of the London Underground network.

### Information integration

- 12.6 Information integration appears to be reasonably good, with details of bus services and fares provided in Underground stations, and with signage to

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<sup>67</sup> LTUC Written Evidence, October 2001.

mainline rail stations and DLR (and in some cases bus stations/stops). London Underground maps show mainline rail, river, and DLR connections and the location of cycle storage facilities/racks. A leaflet and signs at stations indicate when and where cycles may be taken on Underground services. Telephone information lines also integrate bus, Underground and DLR service information, as does information provided over the Internet.

## **Ticketing Integration**

- 12.7 Ticketing integration with other transport modes is mixed. Pre-paid Travelcards can be used on the Underground, buses, DLR, Tramlink and National Rail. The introduction of these has been an undoubted success, but cash fares are non-transferrable. While it is possible to purchase tickets for journeys on National Rail that also extend to the Underground system, it is not possible to purchase single tickets at Underground stations that can also be used on National Rail. The introduction of "smart card" ticketing systems (Prestige) will increase the scope for fares integration for the Underground and other London transport modes.

### **Prestige**

London Underground describe the benefits of the Prestige project on their web site.<sup>68</sup>

#### **What is Prestige?**

Prestige is a 17-year contract signed between London Transport and Transys. The Prestige project will give London Underground and London Bus Services Limited a new, integrated ticketing and revenue collection service. This will include the replacement of existing equipment and the introduction of a range of new, state-of-the-art ticket machines and supporting revenue systems.

The greatest impact of the project on customers and staff will be the introduction of contactless smartcard tickets from next year (2003).

#### **Benefits it will bring**

The new Passenger Operated Machines will give customers touch screen menus, operating guidance in several foreign languages as well as wider payment options i.e. credit/debit cards. The new Ticket Machines in booking offices will allow almost all transactions to be carried out at the window and thus speed up the purchase of tickets.

The Contactless Smartcard will replace many paper and card stock tickets, will bring faster entry and exit through gates and will integrate and bring seamless travel across all public transport.

## **International Comparisons**

- 12.8 The CoMET database does not include specific indicators for integration across transport modes, however the following paragraphs illustrate some of the relevant aspects of other systems.

<sup>68</sup> <http://www.thetube.com/content/about/partner/prestige.asp>

## Physical integration

- 12.9 Comparing the degree of physical integration of the public transport systems in different cities is inherently difficult. All cities have a dense bus network that supplements the underground network. Also in all cities, main railway stations are served by the metro network, and in some cases there are good examples of integration between rail and underground networks (e.g. the RER express metro lines in Paris).

## Information integration

- 12.10 In New York, the various modes of public transport are all advertised by New York City Transit and well integrated. The basic subway map is available at each subway stop and provides information on subways, commuter railways, ferries, airport connections and key bus routes. In addition, subway stations have posters showing New York City Transit bus and subway transfer points at each station along the route. Also, in-station signs direct passengers to nearest bus stops at major transfer points.
- 12.11 In Berlin, the integration between the various modes in terms of information provision is excellent. Clear maps are available that focus on showing the public transport *network* as opposed to showing the individual *modes*, integrating the U-Bahn and S-Bahn systems with the tram and bus systems. As in London these maps are readily available free of charge. The BVG website features a state-of-the-art journey planner providing travel advice between any two Berlin addresses, including detailed maps.

## Ticketing integration

- 12.12 Main single fares in New York (\$1.50) are not integrated with other modes, though they can be used for making transfers between subway lines. An integrated ticketing system was only introduced in New York relatively recently (in 1997). Metrocard allows either unlimited weekly or monthly trips on subways, local buses and (as additional option) express buses; or carnet-style pay-per-ride tickets. The pay-per-ride tickets are 10 per cent cheaper than ordinary tickets and offer one free transfer between subway and buses
- 12.13 In 2000, the unlimited and pay-per-ride Metrocard options accounted for over 80 per cent of non-student trips on New York City Transit.
- 12.14 In Paris, single tickets permit journeys with unlimited changes between metro, bus and express metro (RER) lines for the zones in which the ticket is valid. All travelcards and season tickets are fully integrated; they can be used on all modes. Single tickets in Stockholm also allow unlimited transfers between all modes within the zones in which they are valid, but during one hour only. Here, too, travelcards and season tickets are fully integrated.

## What Can Londoners Reasonably Expect?

- 12.15 Levels of physical integration between the Underground and other services are mixed, though signage between modes is generally good. Improving physical integration would often require significant capital expenditure, but is not possible in many cases because of road layouts and proximity of existing buildings. It is possible however that further improvements might be made in



the future by careful planning of the physical links between transport modes at the design stage.

- 12.16 Some of the new stations on the Jubilee Line Extension, such as Canada Water and North Greenwich, show what can be achieved in the way of physical integration between bus and Underground services with new build (and unrestricted physical sites). But Londoners can expect relatively slow improvements in physical integration at existing stations.
- 12.17 Information integration is generally regarded as good. Londoners should reasonably be able to expect that current standards should be maintained. Ticketing integration on the other hand is quite patchy and evidence from overseas suggests that Londoners might expect some improvements in this area. One need is for multi-modal single journey tickets. The introduction of “smart card” ticketing systems (Prestige) should provide an ideal opportunity to do this, although smart card ticketing is not necessarily an automatic pre-requisite for improved ticketing integration.
- 12.18 TfL already publishes detailed best practice guidelines for integration between modes, in association with London Underground, ATOC, and Railtrack.<sup>69</sup> These provide detailed guidelines on how links between different transport modes should be taken into account both at the design stage, and in day to day operations. The Committee believes that these guidelines should be consistently and demonstrably adhered to by London Underground and that lessons from physical integration on underground systems in other countries are applied in London to improve provision of “seamless” public transport journeys.

*Supplementary Recommendation 10d*

That TfL report on the effectiveness of its internet journey planner in comparison with existing systems such as that found in Berlin and plans to improve this system.

*Supplementary Recommendation 10e*

That TfL shows the Assembly how they have complied with the Intermodal Transport Interchanges for London best practice guidelines.

*Supplementary Recommendation 10f*

That TfL reports the impact of the improvements the Prestige project brings to inter-modal journeys within London and any further plans to improve ticketing integration with other transport systems in London.

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<sup>69</sup> Intermodal transport interchange for London: best practice guidelines, TfL February 2001.

## 13 Summary of recommendations

### Improving Train Frequencies

#### Key Recommendation 1

**Tube users should reasonably expect, with upgraded signalling and better management, minimum frequencies of 35 trains per hour on all the deep tube lines.**

#### *Supplementary Recommendation 1a*

TfL should justify how planned increases to 35 – 38 trains per hour on the Jubilee line can be achieved on other lines within 15 years.

#### *Supplementary Recommendation 1b*

Signalling companies should comment on the technical feasibility of achieving frequencies of 42 trains per hour on the London Underground.

### Reducing Overcrowding On The Underground

#### Key Recommendation 2

**New space standards must ensure that where passengers have to stand on Tube trains they should not have to endure the “crush levels” they currently experience. TfL needs to develop a programme of capacity and performance increases driven by the need to reduce overcrowding to the Paris metro standard of 0.25m<sup>2</sup> minimum standing space per passenger at peak times.**

#### *Supplementary Recommendation 2a*

TfL monitor and publish overcrowding statistics on all lines in the Central zone. These figures should be reported publicly on a four week basis.

#### *Supplementary Recommendation 2b*

TfL should provide forecasts of changing levels of crowding for each line within the Central zone and its plans for reducing these crowding levels over the next 15 years.

### Reducing Passenger Journey Delays

#### Key Recommendation 3

**The number of delays exceeding 15 minutes must be reduced by 30% to match that of the best performing lines on the network within five years of the Underground being handed over to Transport for London.**

#### *Supplementary Recommendation 3a*

TfL should set out targets for improving the reliability of service for each line. These published targets should be understandable to the travelling public and the system of refunds for delays should be more actively published.

#### *Supplementary Recommendation 3b*

TfL should publish figures on the causes of poor reliability for each line.

*Supplementary Recommendation 3c*

TfL should demonstrate how they intend to spread best practice from the best performing lines in areas such as staff availability and train regulation.

## **Improving Safety And Security For Underground Users**

### **Key Recommendation 4**

**That the Mayor of London, as Chair of TfL, appear before the Assembly's Transport Committee within three months of taking control of the Underground to make a statement defining TfL's strategy for safety on the Tube.**

### **Key Recommendation 5**

**TfL should aim to demonstrate an improvement in customer satisfaction ratings of not less than 10% between 2003 and 2008 with regard to safety and security on trains and stations.**

*Supplementary Recommendation 5a*

TfL publish information on a regular basis to allow monitoring of:

- CCTV in train carriages, platforms, ticket halls and walkways
- Fully operational help points
- Stations which are staffed during opening hours
- Staff available outside ticket halls during opening hours

*Supplementary Recommendation 5b*

TfL demonstrates that it has reviewed how it manages shift patterns and staff locations in order to maximise staff availability across the whole network including late at night.

### **Key Recommendation 6**

**That British Transport Police and Metropolitan Police comment on current staffing levels dealing with crime on the Underground and the justification for maintaining a separate Transport Police. They are also requested to report on the issues in terms of co-ordination between the two forces which need to be addressed to ensure that personal security is improved.**

*Supplementary Recommendation 6a*

They are also requested to report on the issues in terms of co-ordination between the two forces which need to be addressed to ensure that personal security is improved.

## **Providing A Cleaner And More Pleasant Travelling Environment**

### **Key Recommendation 7**

**TfL must demonstrate an improvement in customer satisfaction ratings of not less than 10% between 2003 and 2008 with regard to cleanliness on trains.**

*Supplementary Recommendation 7a*

TfL introduce and publish a quarterly survey covering information relating to litter, cleanliness of trains and stations and graffiti as contained in the quarterly Passenger Environment Survey in New York.

*Supplementary Recommendation 7b*

TfL should publish the standards and statistical methods of measuring cleanliness it has developed under the PPP contracts so that the travelling public can understand what levels of improvement in this area can be expected

*Supplementary Recommendation 7c*

TfL should increase the number of on-train cleaners particularly before and after peak hours to ensure that trains are kept as clear of litter as possible without returning to the depot

**Key Recommendation 8**

**TfL must present plans and costed options for cooling trains within a year of control of the Underground passing to their management.**

*Supplementary Recommendation 8a*

That TfL re-evaluate the importance that customers place on an adequate comfort cooled journey in the deep Tube lines and use this in any economic assessment of potential cooling measures on the system in the future.

*Supplementary Recommendation 8b*

That cooling system manufacturers and other organisations be asked to comment on potential solutions to the issue of air conditioning on the Underground.

**Information Provision and Customer Care**

**Key Recommendation 9**

**That TfL reports within one year on their plans for reallocating staff freed from ticket office duties following their ticketing initiatives to duties that are more focused on providing help and information to customers.**

*Supplementary Recommendation 9a*

That TfL report to the Assembly the number of dot matrix information indicators on platforms which are obscured (by other signs for example) and their plans to achieve full visibility.

*Supplementary Recommendation 9b*

That TfL reports on their plans to extend best practice in the dissemination of real-time information to passengers on board trains, platforms, within and outside stations.

*Supplementary Recommendation 9c*

That TfL reports on their plans for reallocating staff freed from ticket office duties following their ticketing initiatives such as Prestige, to duties that are more focused on providing help and information to customers.

**Key Recommendation 10**

**That TfL report on their plans for achieving the "core accessible network" by June 2003 and any changes to funding, feasibility studies or other factors which are mentioned in "Unlocking London for All" which could result in significant delays to the step free access development plan.**

*Supplementary Recommendation 10a*

The current, general, disability awareness training that staff receive should be further improved with more training on how to assist passengers with disabilities.

*Supplementary Recommendation 10b*

The introduction of audio information in train carriages as used on the Central line should be expanded to cover the whole system. TfL should produce their plans to achieve this standard

*Supplementary Recommendation 10c*

TfL in the short-term produce a plan to improve the use of tactile markings at the beginning of escalators, and the use of more colour contrast between surfaces at all stations.

*Supplementary Recommendation 10d*

TfL report on the effectiveness of its internet journey planner in comparison with existing systems such as that found in Berlin and plans to improve this system.

*Supplementary Recommendation 10e*

TfL shows the Assembly how they have complied with the Intermodal Transport Interchanges for London best practice guidelines.

*Supplementary Recommendation 10f*

TfL reports the impact of the improvements the Prestige project brings to inter-modal journeys within London and any further plans to improve ticketing integration with other transport systems in London.

# **Appendix 1 Evidentiary Hearings and Expert Witnesses**

## **First Evidentiary Hearing – 18 December 2001**

Adam Goulcher, Director of Marketing and Planning, London Underground Limited  
Mike Strzelecki, Director of Safety, Quality and Environment, London Underground Limited  
Phil McKenna, Marketing Manager (Journey Time), London Underground Limited  
John Knight, Systems Performance Manager, London Underground Limited  
John Ball, Economist and Strategic Planner, London Underground Limited

## **Second Evidentiary Hearing – 31 January 2002**

Julia Stafford, Director, Crime Concern

## **Third Evidentiary Hearing - 12 February 2002**

Suzanne May, Chair, London Transport Users Committee  
John Cartledge, Assistant Director, London Transport Users Committee  
Ruth Bashall, Greater London Action on Disability  
Andrew Bosi, Chair, Capital Transport Campaign  
Cynthia Hay, Capital Transport Campaign

## **Fourth Evidentiary Hearing – 16 May 2002**

Paul Godier, Managing Director, London Underground Limited  
Adam Goulcher, Director of Marketing and Planning, London Underground Limited  
John Ball, Economist and Strategic Planner, London Underground Limited

# **Organisations Providing Written Evidence**

AEA Technology  
Age Concern  
Capital Transport Campaign  
Commission for Integrated Transport  
Crime Concern  
Describe Online  
Greater London Action on Disability  
Institute of Logistics and Transport  
Joint Committee for the Mobility of Blind and Partially Sighted People  
London Transport Users Committee  
London Underground Limited  
Metronet  
Metropolitan Police  
New York Metropolitan Transit Authority  
Nexus  
Royal National Institute for the Blind  
Royal National Institution for the Deaf  
Strathclyde Passenger Transport  
Transport Research Laboratory

## **Individuals Providing Written Evidence**

J Baher  
Eugene Donnelly  
Justine Fallis  
Mr R Fenlon  
Mr N R Gansell  
Mr Christian Grobel  
Mr P G Hawes  
Miss J L Hetherington  
Mr Nick Inman  
Mr C E Johns  
Mr C Lawrence  
Mr Simon Maier  
Ms Jan Owen  
Mr C J Roffey  
Dr Jack Sultoon  
S Turceninoff  
Ms Sophie Wiggins  
Mr Nigel Wilson

## **Appendix 2 The Comparator Metro Systems<sup>70</sup>**

### **New York**

The city of New York itself has a population of around 8 million, though the number of people living in the entire New York City region exceeds 21 million. The population density of the city is high with more than 10,000 people per square kilometre (London: around 4,500).

New York has the largest metro system in the world in terms of route length, number of lines and number of stations. The system mainly covers Manhattan and Brooklyn; there are some services into New Jersey but these are operated by a different authority. Total route length is 398km, slightly less than the length of the London network. There are 468 stations on the system, with an average distance between stations of some 850 metres (London: 1600 metres). Importantly, the average journey length on the New York system is markedly shorter than on the London Underground.

Due to inadequate maintenance, the New York subway system was in a run-down condition by the late 1970s, with unreliable services and outmoded practices and equipment. Following a declaration of a “transport emergency” by the New York State Legislature in 1981, massive funds were devoted to the modernisation and rehabilitation of the system. Although this did not involve the construction of new lines, a number of network expansion projects are planned for the next decades. Almost 20 per cent of the funds in the 2000-04 capital program of the Metropolitan Transit Authority are devoted to expansion projects.

Over 40 per cent of line-km in New York have quadruple tracks and another 25 per cent are triple-track lines. This allows express trains to operate on many lines, as well as other skip-stopping services, eg night services. In London, by contrast, almost all lines have twin tracks, although there are a few cases where two different lines run parallel to each other for several kilometres (e.g. Piccadilly and District between South Kensington and Acton Town; Jubilee and Metropolitan between Baker Street and Wembley Park). Further operational flexibility is provided on many of New York’s lines by provision of bi-directional signalling (so tracks can be operated in either direction), unlike many other metro systems. The headway between trains is approximately 2 to 5 minutes during peak times, 10 to 15 minutes during the daytime off-peak, and 20 minutes after midnight. This applies to individual lines; since many lines run parallel on trunk sections, frequencies on some key sections of the network are in fact higher. These headways are broadly compatible to those in London.

### **Paris**

The Paris metro network provides a closely-knit in-town network with exceptionally closely spaced stations. Consequently, a substantial proportion of metro passengers are making short journeys, which might be taken by bus in London. The network extends to the inner suburbs of the city but, unlike in London, not beyond that. For example, in the 8-zonal tariff system in the Greater Paris area, no metro line extends beyond the distance that defines zone 2 on the London Underground.

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<sup>70</sup> NERA Final Report, pages 13 – 16.



A number of outer suburbs have now been linked to the central area by the Regional Express System (RER), which uses existing surface suburban lines in the outer areas. Some of the five RER lines are jointly or solely operated by French National Railways. The proposed Crossrail scheme in London would be similar in nature to the RER lines in Paris.

The conventional network (excluding RER) has 14 lines and a total network length of just over 210km. Although no new lines were built in the 1980s, the network was slowly expanded through extensions of existing lines. In the 1990s, however, it was decided to build a completely new line (Line 14 "Météor") from the south to the north-west of the city. The first 7km stretch opened in October 1998; work on a further section is currently under way. It has taken ten years from the first presentation of the ideas for the new line to the Government to the opening of its first stretch, with the actual construction taking six years.

About one third of the network is operated by rubber tyred trains. The 297 stations imply an average distance between stations of 700 metres (London: 1600 metres). On an average weekday, the system is used by about 4.35 million passengers. Peak service intervals in Paris are generally between 1.5 and 2 minutes. During the middle of the day, headways are around 3.5 minutes, whereas trains run every 7 or 8 minutes during late evenings. A somewhat reduced service operates in the summer months. Thus the average operational intensity is somewhat higher than is the case in London.

## **Berlin**

Berlin is the capital of the unified Germany and has a population in its metropolitan area of around 3.5 million. The city has a population density of around 4,000 people per square kilometre (London: around 4,500).

The Berlin "U-Bahn" network consists of nine lines with a total length of 144km. There are 170 stations, implying an average distance between stations of almost 900 metres (London: 1600 metres). In recent years, the network has been expanded somewhat, although this mainly reflects the impacts of the re-unification of the city.

The U-Bahn complements the S-Bahn system in Berlin, a fully separated heavy rail system, largely elevated. Although some S-Bahn lines extend somewhat beyond the Berlin metropolitan area (unlike the U-Bahn), it is mainly an urban means of transport. In practice there is a substantial degree of exchangeability between U and S-Bahn services.

The first U-Bahn line opened in 1902 (S-Bahn 1882). Whilst a substantial proportion of the system dates from the early 20<sup>th</sup> Century, considerable reconstruction took place after 1945. The U-Bahn system in the former West Berlin was expanded substantially after the construction of the Berlin Wall in 1961 to alleviate overcrowding arising from customer resistance to use of the East German controlled S-Bahn system. Further new line construction and extensive modernisation has followed the re-unification of the city.

On workdays, the U-Bahn operates between 04:00h and 01:00h, with trains generally running every 3 to 4 minutes during peak hours and every 5 to 10 minutes during the off-peak. Thus service frequencies are broadly compatible to those in London.

## **Stockholm**

Stockholm, a city with 1.7 million inhabitants in its metropolitan area, has a "Tunnelbana" system with 3 lines, 11 branches and a network length of 110km (64km of which are in tunnel). There are 100 stations, thus giving an average distance between stations of 1100 metres (London 1600 metres). The first line of the network did not open until 1950, with the network being completed in its present form in 1975. The network covers the entire city and is operated by Connex Tunnelbanan on behalf of the transport authority SL. SL owns 40 per cent of Connex Tunnelbanan's shares. The Tunnelbana is notable among metros for having pioneered innovations such as cab-signalling, integrated metro/new town planning.

## **Madrid**

Madrid is the capital of Spain with a population in the Madrid metropolitan area of around 3 million people and a population density of some 5,000 people per square kilometre (London: 4,500)

Madrid's metro network has been growing rapidly over recent decades and now consists of an 11 line system with 158 stations, covering virtually the entire metropolitan area. The current length of the network is just over 171km, implying an average distance between stations of almost 1100 metres (London: 1600 metres). Of the network, 50km has been constructed during the last 10 years. A 12<sup>th</sup> line, 40km long, is under construction. When this is completed, the total length of the tunnel sections in Madrid will be some 188km. Presently, some 85 per cent of the network is in tunnel, a considerably higher proportion than London.

The system operates from 06:00h until 01:30h. On most lines, trains run every 2-3 minutes in peak hours and every 4-6 minutes during the day. On one line, the peak headway is only 90 seconds, implying 40 trains per hour. This is somewhat greater than on any line in London, whilst those on the other lines are broadly compatible to London.

## **Barcelona**

Barcelona, a city with a metropolitan area in which over 2.5 million people live, has a metro network consisting of five lines and 112 stations. The length of the network, operated by the main operator TMB, is about 81km, giving an average inter-station spacing of 720 metres. Another two lines with a total length of 44km are operated by a different operator FGC. Virtually the whole network is in tunnel. One of the TMB lines (Line 2) did not open until the 1990s.

On weekdays, the system operates from 05:00h until 23:00h. On Fridays and Saturdays, the service is extended until 02:00h. During peak hours, trains run every 3 to 4.5 minutes. Off-peak intervals are between 4 and 6 minutes, with trains running every 6 to 9 minutes during evenings and Sundays. Peak service frequencies are thus rather less than London's 2 to 4 minutes.

## Appendix 3 – Proposed Tube Improvements and Targets in the Mayor's Transport Strategy

Proposal 4C.1 The Mayor and Transport for London (TfL) will require London Underground to produce costed proposals to return the percentage of Underground services operated to the levels achieved between 1991 and 1996, with particular and immediate attention to the worst performing lines. (Proposals to be produced by mid 2002.)

*Proposal 4C.2 The Mayor and TfL will require London Underground to produce costed proposals to safely increase the total amount of train kilometres operated over the existing network. (Proposals to be produced by mid 2002.)*

Proposal 4C.3 TfL will conduct a proper engineering assessment to determine both the cost and the time required to address the deficiencies of the existing Underground infrastructure and to identify immediate and longer term priorities. (This should be done as soon as possible.)

Proposal 4C.4 The Transport Strategy proposes a new partnership between Government, the Mayor and TfL to create a long term, stable financial regime to fund the Underground.

Proposal 4C.5 Targets will be set by TfL to improve Underground performance to reach the benchmark of comparable world city Metros. (This should be done as soon as is practicable.)

Proposal 4C.6 The Mayor will set a target of halving the delays caused by equipment failures by 2008 (against a 2000/2001 base).

Proposal 4C.7 The Mayor will require London Underground to achieve core improvements to upgrade existing Underground lines. Any plans developed by London Underground will be subject to review once TfL has taken responsibility for the Underground, with a view to concentrating resources where they are most needed

Proposal 4C.8 The Mayor will require London Underground, as a matter of priority, to implement a focused programme to solve the problem of out of service escalators and lifts. (Programme to be developed by early 2002.)

Proposal 4C.9 The Mayor will require London Underground to develop and implement a prioritised programme to improve conditions at London's most congested stations. (Programme to be developed by mid 2002.)

Proposal 4C.10 TfL and London Underground will agree a costed and timetabled programme (including both large and smaller scale schemes) of station and interchange improvements. (Programme to be agreed by 2003.)

Proposal 4C.11 The Mayor will require London Underground to implement a phased programme of improvements to ensure greater levels of accessibility and create a core accessible network. (TfL will develop a plan by mid 2002, for the implementation of a core network of accessible stations on the Underground.)

Proposal 4C.12 Transport for London, London Underground, the London boroughs and other appropriate agencies, will develop a programme of actions to address safety issues and personal security fears on the Underground, and on journeys to and from Underground stations.

Proposal 4C.13 The Mayor and TfL will work with the Strategic Rail Authority to address the long term need of the Underground for a substantial increase in capacity through the proposed new east-west CrossRail, the Hackney-SouthWest Line, and extensions of the East London Line.

## Appendix 4 Orders and Translations

For further information on this report or to order a bound copy, please contact:

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## Appendix 5 Principles of Assembly Scrutiny

The powers of the London Assembly include power to investigate and report on decisions and actions of the Mayor, or on matters relating to the principal purposes of the Greater London Authority, and on any other matters which the Assembly considers to be of importance to Londoners. In the conduct of scrutiny and investigation the Assembly abides by a number of principles.

Scrutinies:

- Aim to recommend action to achieve improvements;
- Are conducted with objectivity and independence;
- Examine all aspects of the Mayor's strategies;
- Consult widely, having regard to issues of timeliness and cost;
- Are conducted in a constructive and positive manner; and
- Are conducted with an awareness of the need to spend taxpayers money wisely and well.

More information about the scrutiny work of the London Assembly, including published reports, details of committee meetings and contact information, can be found on the GLA website at <http://www.london.gov.uk/approot/assembly/index.jsp>

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