
The PPP: Two Years In

The Transport Committee's scrutiny into the progress of the PPP
June 2005



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Greater London Authority

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Published by

Greater London Authority

City Hall

The Queen's Walk

London SE1 2AA

www.london.gov.uk

enquiries **020 7983 4100**

minicom **020 7983 4458**

This publication is printed on recycled paper

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The Transport Committee's general terms of reference are to examine and report on transport matters of importance to Greater London and the transport strategies, policies and actions of the Mayor, Transport for London, and the other Functional Bodies where appropriate. In particular, the Transport Committee is also required to examine and report to the Assembly from time to time on the Mayor's Transport Strategy, in particular its implementation and revision.

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Chair's Foreword



Two years after the PPP contracts were signed, this report provides a valuable opportunity to take stock of their performance. Have the concerns, which were widely expressed at the time, been borne out? How can the resulting relationships be better managed to get the best deal for London?

London Underground and the infrastructure companies have provided invaluable assistance to the committee in reaching our conclusions and we appreciated their open and constructive approach. All concerned are keen to make PPP work.

First the good news; More trains than ever are available for service, with particularly strong performances on the Piccadilly and Central Lines; better cleaning and graffiti removal have created a noticeably better travelling environment; plans to add a seventh car to Jubilee Line trains are well advanced.

Elsewhere the story is not so good. Overnight engineering work increasingly runs late, with knock on disruption to morning commuter services and recently this has proved a particular problem for Metronet. Consistently poor performance on the Northern Line has led to Tube Lines' proposal to close sections so that work can be carried out to repair track and signalling. On some lines the programme for track and station renewal is running behind schedule.

There are no easy answers on the Tube and this report does not seek to find them. We offer our guarded support for London Underground's call for accelerated investment and for proposals to close sections of the Northern Line to allow major work to take place. Such closures must be seen as the exception to standard practice and should not become the rule. We also urge the infrastructure companies to cut the number of engineering overruns and Metronet in particular, to bring its renewal plan back on schedule.

Londoners are entitled to expect nothing less.

A handwritten signature in black ink, appearing to read 'Roger Evans'.

Roger Evans

Chair, London Assembly Transport Committee

Executive Summary

‘You gotta dance with who brung yer.’

Tim O’Toole, Managing Director, London Underground, Transport Committee, 10th March 2005

It is two years since the PPP contracts were signed. Irrespective of the opposition to the contracts –and there was plenty, not least from some members of the London Assembly Transport Committee itself – the PPP is, for now, the principal delivery mechanism for the long overdue and vital renewal of the London Underground. The arguments have been made in court and on Committees here and in Westminster. But the question that needs asking now is not whether the PPP was the right or wrong way to approach this massive job but two years in, is the PPP actually delivering?

Is the PPP actually delivering?

Not surprisingly, the Committee has found that the answer is a frustrating and complex, yes and no.

Some aspects of Infraco performance are encouraging. The Committee is pleased to report improvements in the number of trains available for service, the performance of the Central, Bakerloo and Piccadilly Lines, the passenger environments on trains and in stations and the turnaround of escalator renewal.

The Tube is in better shape than it was two years ago. But as Tim O’Toole articulated to the Committee, ‘there is no cause for satisfaction’ as there was a very low starting point – prior to the PPP, the Tube was deemed inadequate.

Frustration at the performance of the Infracos, and in particular Metronet, has been keenly felt. John Weight recently left his position of Chief Executive at Metronet – one of the two infraco companies contracted to renew the Underground – after shareholders decided that they ‘needed someone new to bring about change’.¹

John Weight conceded, in addressing the Transport Committee back in March before his departure, that certain aspects of its performance had been ‘unacceptable’.² That was mild compared to the criticism levelled at Metronet by the Transport Commissioner, Bob Kiley who described Metronet’s performance to the Assembly as ‘bordering on disaster’.³

The conclusions arrived at by both shareholders and TfL were based on the slow progress of asset renewal since the PPP had started. Metronet’s station refurbishments programme – behind schedule by almost four months⁴ – and the increasing number of engineering overruns for both Infracos – have proved to be sources of particular frustration for all involved.

And the Northern Line, whose renewal is the responsibility of the second infraco company Tube Lines, has been blighted by delays to such a degree that London Underground is now considering a plan from Tube Lines for full line and branch closures so as to allow for more engineering time.

¹ See <http://news.bbc.co.uk/1/hi/england/london/4437427.stm>

² Transcript of Transport Committee meeting 10 March 2005

³ Assembly Plenary, April 2005

⁴ TfL Board papers, 18 May 2005

Closing parts of the Northern Line

The Transport Committee offers its conditional support for the proposed line and branch closures along sections of the Northern Line, the Tube's most heavily used line. The closures would represent a significant departure from the original PPP contracts but unfortunately do appear in this instance to be a necessary intervention.

However these closures should not come to represent a template for the claw back of any future failures of the PPP. The PPP was designed with the specific intention that whole chunks of London would not be left isolated by line closures because such closures have obvious far reaching impacts for the communities affected – not least the daily inconvenience of using alternative forms of transport.

Any changes to the contract must not provide potential incentives for future line closures. And perhaps most importantly, the savings enjoyed by Tube Lines from the improved engineering conditions should be ploughed back across all of their three lines.

The Committee expects an accelerated renewal of the Northern Line from the line closure but we would also expect to see tangible improvements to other aspects of Northern, Jubilee and Piccadilly Line performance.

Improving Management, Accelerating Investment

The Committee was consistently reassured that by 2010, the improvements outlined for the first 7.5 year phase of the PPP would have been achieved. But is 2010 soon enough? For the vast majority of passengers obviously not.

The Committee heard with some sympathy the pleas from London Underground for a speedier rate of investment to crank up short-term performance but has, like the National Audit Office before us⁵, also found that there is limited incentive for the Infracos to accelerate investment prior to meeting the 2010 deadlines.

However, it is not just about the Infracos committing more investment that will bring about improvement. There must be an improvement in management from within the Infracos, especially Metronet. There are also management risks to be mitigated by London Underground themselves, especially with the co-ordination of PFIs on the Northern Line radio system (delayed now until 2007) and the electricity supply for the Underground.

The recent changes in Metronet's personnel are a welcome demonstration of the shared frustration of shareholders and passengers alike. Metronet's new leadership must now act to restore the reputation of Metronet, and the PPP as a whole, before shareholders can realistically consider an accelerated programme of investment.

It is vital that Metronet is able to demonstrate that its station refurbishment programme is back on schedule by the end of 2005 and that both Infracos are able reduce the absolute number of engineering overruns substantially from current levels by the end of 2005.

The Transport Committee looks forward to monitoring their progress and will question the new Chairman and Chief Executive of Metronet, Keith Clarke and Andrew Lezala, on 21 July 2005, about their immediate plans for Metronet.

The Transport Committee will examine progress in March 2006.

⁵ Are the PPPs a good deal? June 2004

1. Introduction

- 1.1 The PPP is now just over two years old. Overall performance of the tube network is considered to be improving – government service targets are expected to be exceeded, customer satisfaction levels are higher and each day millions are being invested into Tube by the private sector engineering companies contracted by London Underground to improve its ageing infrastructure. However the program of renewal is not proving to be seamless.
- 1.2 Message boards on each and every station across the Tube network regularly list ‘severe delays’; posters on stations offer apologies from London Underground about why a line wasn’t operating the previous day, and every morning passengers whose tube lines are being worked on the night before wince in anticipation of a fresh delay.
- 1.3 As John Weight, the former Chief Executive of Metronet – one of the two companies who have been charged with renewing the tube’s infrastructure over the next 30 years – told the London Assembly’s Transport Committee ‘perception and reality can part company’ when assessing the performance of the Tube. This review by the Transport Committee assesses just how the PPP is progressing and attempts to reconcile the perception of the hassled Northern Line commuter with the reality of the actual progress being made on overhauling the whole Tube – from its rolling stock to its stations, from its track to its escalators. This report seeks to answer the question:

Is progress in renewing the infrastructure of the Tube being achieved at a sufficient rate to justify the delays and inconvenience being felt by Tube passengers?

- 1.4 In attempting to answer this question, the London Assembly’s Transport Committee heard from the Managing Director of London Underground, Tim O’Toole, and the now departed Executive Chairman of Metronet, John Weight, and Terry Morgan, Tube Lines’ Chief Executive, in an evidentiary session on 10 March 2005. The Committee has also trawled extensively the performance monitoring information that tracks progress on each underground line.

Background

- 1.5 It was in April 2002, after years of negotiation hindered by legal wrangling and widespread political opposition, when the last of the Public Private Partnership contracts (PPPs) was signed between London Underground Limited (LUL) and the private sector organizations Metronet and Tube Lines (the Infracos). The tube was to undergo a 30-year infrastructure renewal program with unprecedented levels of long-term investment that sought to address the years of under investment that had left the Tube apparently lagging behind the metro systems of other world cities such as New York, Tokyo, Moscow and Paris. However, this renewal would be executed by the private sector and supervised by the public sector.
- 1.6 London Underground retained ultimate ownership and responsibility for trains and stations while the private sector partners took on the maintenance and renewal of infrastructure including stations, track and signalling. This split between infrastructure renewal and operational control is unique among metro systems in the world.

- 1.7 Applying a 6 per cent discount rate London Underground evaluated the net present value of all three PPPs at £1.57 billion in 2003. The Department of Transport provides funding to cover LUL service charge payments to Metronet and Tube Lines. However the payments made between LUL and the Infracos are much more complicated relying on complex output and target based contracts that use abatements and bonuses to lever performance. These contracts will be reviewed periodically every 7.5 years by the PPP Arbiter, with extraordinary reviews triggered in exceptional, pre-agreed circumstances.
- 1.8 The Tube has been split into three entities with regard to the PPP. Metronet is responsible for the renewal of most of the deep tube lines and sub-surface lines; Tube Lines is responsible for the remaining lines. Both Metronet and Tube Lines were specifically formed to execute the PPP and are composites of engineering and project management companies who brought with them international experience (see below).

Chief Exec	Infraco (Partners)	Lines
Andrew Lezala	Metronet (WS Atkins, Balfour Beatty, Bombardier, Seeboard and Thames Water)	Deep Tube Lines Bakerloo, Central, Victoria, Waterloo & City Sub-surface lines Circle, District, Metropolitan, Hammersmith & City, East London
Terry Morgan	Tube Lines (Amey, Bechtel Ferrovial)	Jubilee, Northern, Piccadilly

2. How is the Tube performing under PPP?

- 2.1 The performance of the London Underground and the PPP are monitored separately however inevitably and intrinsically the two are linked. London Underground's performance is monitored against the Department of Transport performance targets. The performance of the PPP is measured against the targets within 30-year contracts and the performance targets within them.
- 2.2 The Department of Transport measures performance through customer satisfaction surveys, the number of passenger journeys, revenue, excess journey time, peak time cancellations and kilometres operated. Performance against these criteria is exceeding government targets and is summarised below.
- 2.3 The performance of the Infracos is measured against 181 benchmarks set out in the 30 year long PPP contracts. These 181 targets cover the number of trains available on each line for LUL to operate, the ambience of stations, the state of a stations facilities (such as ticket machines and train time readers), and the rate at which track, lifts, escalators, and stations are being renewed, refurbished or otherwise modernised.

The Performance of the London Underground

- 2.4 The latest performance report covering the Christmas period from Tim O'Toole to the Underground Advisory Panel highlighted continuing performance problems with the Northern Line (due to the failure of the train radio system) and the East London Line (due to late running and consequent cancellations). The report also highlighted the smooth running of the Tube on New Year's Eve.
- 2.5 Overall satisfaction with the Tube is above expectation for the financial year so far, hovering slightly above the 75 per cent expected levels. Both passenger journey and revenue levels have been above target levels for the last six operating periods⁶ after dipping below during the first three periods of 2004/05.
- 2.6 Journey times⁷ for passengers are just about keeping to expected levels. The Metropolitan, East London, Northern and Piccadilly all report additional excess journey time averages. The Bakerloo, Victoria and District Lines showed the most marked improvement during the Christmas period.
- 2.7 Annual figures obtained via the London Assembly's Mayor's Question Time, show that peak train cancellations dropped dramatically in 2004, largely due to the inflated figures from 2003 caused by the Northern and Central Line derailments and subsequent line closures. There has been a notable decrease in cancellations caused through the unavailability of a driver and rolling stock defects.
- 2.8 However these improvements have been partially offset by the increase in cancellations caused by industrial action that has increased massively from only 46 cancellations for 2003 to 910 for 2004⁸.

⁶ TfL monitor performance by 13 four-week periods over the financial year.

⁷ Journey times are measured by monitoring excess journey times. Excess journey time is the difference between actual journey time and the time predicted if services run to time and there are no delays

⁸ A full set of figures is attached as Appendix A and was obtained from the Mayor via a written response to a question from Roger Evans AM.

The Infracos

- 2.9 Establishing the level of performance of the PPP and the Infracos is, by comparison, a more complicated and subjective process. With such a notoriously complex labyrinth of a contract, which has over 180 performance targets as a basis, it was also going to be complex. The natural dynamic of the client/supplier relationship also inevitably breeds a subjectivity that can cloud actual performance. London Underground want more as the client; the Infracos as suppliers have limits.
- 2.10 There are unquestionably positive signs. More trains are available for service (measured in lost customer hours) than ever before with particular improvement on the Piccadilly and Central Lines. Good performances – generally where bonuses have outscored fines throughout the year – were recorded on the Bakerloo, Piccadilly, Metropolitan, Circle, Hammersmith and District Lines. Recent improvements to previously below average performances have also been recorded on the East London, Jubilee, Victoria and Central Lines.
- 2.11 However, the Northern Line is the only line on the Underground that has consistently operated throughout the duration of the PPP beneath target performance levels. Tim O'Toole informed the Committee that 'the Northern Line is our most complex line; it is our heaviest ridership; it is the most intensive service we offer, and it is our biggest problem.' The reasons for the problems are numerous and are discussed in a Case Study on Page 13.
- 2.12 More trains are available and the trains themselves are providing Tube users with a cleaner environment. Stations too have been cleaned effectively by the Infracos and this 'ambience' strand to the PPP contract has been a relatively consistent success since the PPP started.

Rate of Asset Renewal

- 2.13 The principal focus around the performance of the Infracos remains the rate of Asset Renewal – that is the track, signalling, lifts, escalators and stations – which continues to be slower than indicated in the PPP bids. The primary concern about this slow progress is that the increased activity planned for the later stages of the first four 7.5 year cycles that comprise the 30 year deal could force LUL's hand into closing lines beyond agreed engineering slots and has a dramatic impact on mainstream, Monday-Friday services (see Chapter 3).
- 2.14 The measurement of the rate of asset renewal is difficult to pin down as the approaches or classifications by which renewal is monitored change as the work progresses. It is also important to remember that, although the Infracos incur fines by not attaining a certain level of performance throughout, the biggest fines are levied at the end of the first 7.5 year period. It is up to the Infracos how and when they reach the strict performance targets within that period.
- 2.15 An example of how this fluctuating monitoring was illustrated to the Committee with the rate of lift and escalator renewal. According to the London Underground's Advisory Panel, which monitors the performance of both the Tube and the PPP, the Infracos have revised down the planned renewal for the 7.5 year from 58 per cent of all lifts and escalators to 44 per cent. For Tube Lines this figure appears to have been scaled back from 65 per cent to 51 per cent.

- 2.16 The figures are right but the reality more complex. The initial contracts had Tube Lines renewing about 190 lifts and escalators; within the first seven and half years 140 will be renewed. The apparent shortfall is due to a reclassification of some of the repair work needed; an engineering decision that means that the remaining 50 or so lifts and escalators that only require 'a minor intervention' rather than the full scale overhaul that the contract outlines. Indeed Tube Lines pointed to significant progress on how it repairs escalators - the renewal of escalators at Green Park where work would normally take 26 weeks in actual fact took only nine. Tube Lines expect to exceed the number of lifts and escalators allocated for work in the first 7.5 years of the contract.
- 2.17 However there is not always a good explanation behind apparent slow progress. Metronet readily admitted that its station renewal program was behind schedule (by an estimated 15 weeks⁹) and more work was required but that Metronet was still confident of hitting their 7.5 year targets with a dramatic improvement expected over the next 12 months.

Track & Signalling Renewal

- 2.18 The area of renewal that has arguably the most impact on Tube passengers is on track and signalling. Where a track fails or signalling doesn't work, delays can be severe and whole services cancelled. The rate of the track renewal, across the whole tube, is also behind schedule two years in. Performance varies across the three sub sections of the Tube: on the Jubilee, Northern and Piccadilly lines track renewal is ahead of schedule. On the two other sets of lines, managed by Metronet, track renewals are behind schedule for the first 7.5 year period.
- 2.19 Why are there these delays in renewing the track and signals of the Tube? Terry Morgan pointed out to the Committee that in the initial stages of the contract it was simply a case of not knowing the condition of the assets that needed work. Assets were in variable condition and since the PPP started operations the Infracos have developed a better understanding of where the investment is actually needed, as illustrated with the reclassification of certain lift repairs. From a base of admitted 'limited knowledge'¹⁰, the Infracos have developed their programmes accordingly, hence revised short-term targets.
- 2.20 John Weight further explained using the District Line as an example of how bid and contract assumptions have had to be changed since the PPP start up. Based on the information available to the infracos at the time the original plan assumed that track would be renewed east to west in one broad sweep. After surveying the work in detail, it was decided that this was not the safe way to proceed. The revised plan has renewal starting in Zone 1 and moving outwards. 'These programmes will flex; they will change.'¹¹ And as a result so too does the rate of progress and the impact on customers.
- 2.21 One of the most damaging characteristics to this sometimes slow, revised progress is the engineering overrun. Up to the start of 2005, there had been a total of 278 engineering overruns on the Tube since PPP start up.

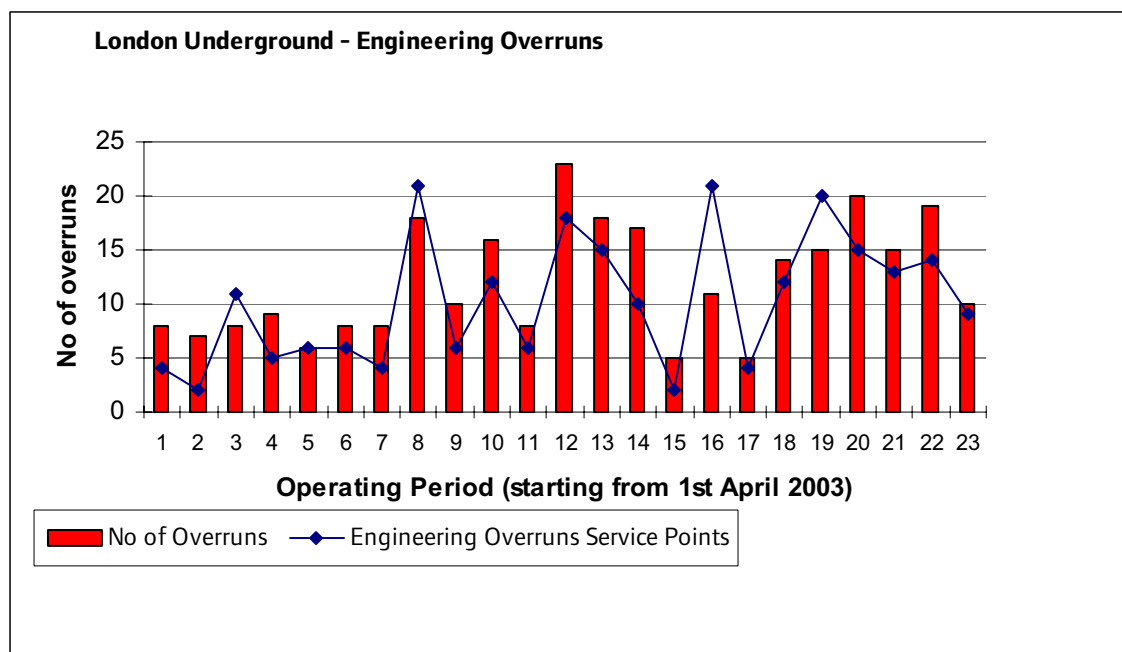
⁹ TfL Board Papers, 18 May 2005, Report 4, Paragraph, 4.7

¹⁰ Terry Morgan, Transcript of Transport Committee meeting 10 March 2005

¹¹ John Weight, Transcript of Transport Committee meeting 10 March 2005

3. Engineering Overruns

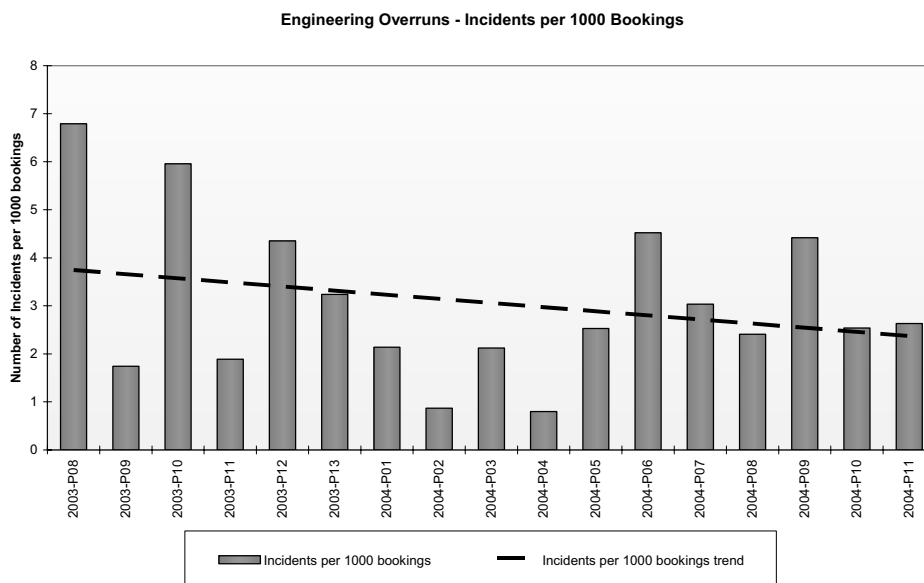
- 3.1 Major engineering work takes place predominantly either overnight (to avoid disruption of service) or at weekends (on the back of line or branch closure to avoid impact on peak weekday services). These slots are far from ideal for those planning the engineering work but were designed to minimise impact on the passenger and their inconvenience and logistical difficulties were reflected in the high payments LU make to the Infracos.
- 3.2 For overnight engineering work the timetable is tight. Typically, an overnight engineering slot allows for four hours of work, either side of which power has to be switched off and back on, engineers have to get access to and from the site bringing and removing all their equipment from the site. Weekend slots may work to longer hours but also undertake work on a proportionate scale and have also been vulnerable to overruns.
- 3.3 Overruns are an obvious risk and can have massive impact on the service - especially if the overrun's consequences bleed into the rush hour and either delay or entirely close a section of a line. The 278 engineering overruns¹² reported up to January 2005 have between them cost Tube Lines and Metronet in excess of £1.2m worth of penalty payments. London Underground point out that there has been 'a marked increase in the number of engineering overruns' since the start of the PPP. London Underground measure performance on overruns in absolutes and unquestionably the number of overruns has increased (see below).



- 3.4 For the Infracos their performance is measured in rates; there may be more overruns taking place but that is simply because the number of projects has increased dramatically. Per 1,000 jobs the rate of engineering overrun is dropping. Evidence provided by Tube Lines to the Committee highlighted the downward

¹² See Appendix C for detailed monthly breakdown.

trend with regard to the proportion of overruns per 1,000 slots occupied (see below)



- 3.5 The Committee was told that overruns occur for two reasons. Firstly, there is an emergency situation detected very late in the evening, which for safety reasons, must be addressed. These overruns are an unavoidable necessity. The second reason for overruns is when work is not completed in time for services to be resumed because there has been ‘simply bad planning and bad execution.’¹³
- 3.6 John Weight accepts that overruns have been a problem for Metronet. ‘We have actually operated in this last 11 months something like 39 weekends of work, and we have overrun 14 times. That is unacceptable’.¹⁴ Overruns are dealt with in two ways; either a closure of the line on that section or the introduction of a temporary speed restriction. Both can be massively disruptive to Tube passengers.
- 3.7 The failure to manage engineering work effectively is a cause of much frustration. Tim O’Toole cited an example of how this failure obscures the progress being made on improving the service on the Tube. He said, ‘we continue to struggle against ourselves, and we are not seeing performance at the level we require.’¹⁵

‘We had some very, very rough weather for the Underground [during February]. We had a lot of snow out in the Amersham area [and] precipitation every night and freezing temperatures in the middle of the night. Anyone who understands this system knows this is the most difficult environment for us to operate in.

You will recall last year, a very little bit of precipitation shut down the system. This year, as a result of the enormous amount of work on my side, as well as on the Infracos, with numerous phone calls through the day planning how to deal with this weather – calls in the morning, in the afternoon, late in the evening – constantly changing operating plans so we could deal with it, we had absolutely zero service interruption as a result of this weather, when there was on the rail

¹³ John Weight, Transcript of Transport Committee meeting 10 March 2005

¹⁴ As above

¹⁵ Tim O’Toole, Transcript of Transport Committee meeting 10 March 2005

side. This should have been a week where [the Infracos] were able to stand up and say, 'Look, we cracked this problem. Okay, we had a problem last year, but this is an example of how we have been able to make improvements.'

Yet, in that exact same week, the whole headline gets buried, because we had a completely unnecessary temporary speed restriction extended in East Ham that completely destroyed service on the District Line through the peak and an engineering overrun at Acton Town that should never have occurred, because that work should not have occurred in engineering hours on a weekday'.

- 3.8 There have been accusations that the Infracos 'made financial judgments to keep overnight engineering works running into the rush-hour'¹⁶ as the fines levied by the contract do not provide enough of an incentive to finish work on time. It is an accusation that both London Underground and the infracos refute. John Weight told the Committee 'that I know that even the few number of minutes [of overruns into peak service] can have a devastating effect into the peak. That is not where I want to be.'¹⁷
- 3.9 The calculation that the Infraco makes when faced with a potential overrun is not based on not wishing to bring a 'crew down the next night.'¹⁸ Rather the infracos weigh up whether the fines incurred through reduced service, brought about by a temporary fix and speed restriction, would prove more expensive than those for an engineering overrun by completing the work late.
- 3.10 John Weight elaborated on the dilemma. 'It may well be that in certain parts of the network, a speed restriction of 20 miles an hour can be coped with. It may cause some disruption in the peak. It may be something that the [London Underground] can live with. If it is five miles an hour you cannot. Five miles an hour over, say, 100 or 200 yards is not acceptable. It devastates the service.'¹⁹
- 3.11 Are the fines imposed on either service availability (affected by speed restrictions) or engineering overruns enough? Not surprisingly the Infracos think they are. John Weight cited an example where the total mismanagement of a four hour engineering slot had cost Metronet £250,000 in fines. However, Tim O'Toole while keen to stress how hard the Infracos were working to eradicate the overrun problem, admitted to the Committee that if overruns 'keep happening, one would fairly conclude the penalties are not sufficient.'²⁰
- 3.12 So what is being done so that the overrun problem can absolutely be sorted and addressed? There is a great deal of joint working between London Underground and the Infracos. Neither is satisfied with persistent failure; London Underground does not want to remain as 'scorekeepers' merely collecting fines and the Infracos are keen to improve on performance. To this end, London Underground informed the Committee that extensive work has been done on streamlining the processes that London Underground's Track Access Office operate under. It has had some

¹⁶ The Guardian, Monday 21 February 2005

¹⁷ Transcript of Transport Committee meeting 10 March 2005

¹⁸ As above

¹⁹ As above

²⁰ As above

effect with the late turn-off of current on the track down from 30 per cent to 10 per cent of engineering slots.

Full line closures

- 3.14 The most dramatic option available to London Underground and the Infracos for accelerating track and signal renewal is full line or branch closures. This would navigate the problem of limited access and should allow works to be completed at a faster rate than if the system of evening and weekend slots were to continue. This would represent a radical departure from the PPP contracts and would potentially provide Tube Lines with substantial savings.
- 3.15 For London Underground to entertain the idea, Tim O'Toole outlined the three conditions that would need to be addressed:
1. The Infracos must be able to resource the work – it has to be delivered on time.
 2. London Underground has to be able to put back some of the savings the infracos make from the line or branch closure into the system.
 3. London Underground and TfL have to be able to handle it.
- 3.16 It is the second condition over which there will be most haggling. The PPP deal was priced on the assumption that engineering hours would be limited and, by necessity, difficult. Tim O'Toole argues 'if we are going to bring forward this more efficient way of working for them, they have to share those proceeds with London.'²¹
- 3.17 Terry Morgan, on whose Tube Lines contracts it is most likely that full branch closure could occur, is happy to accept 'benefits will be reinvested back into the Underground.' However, he was also keen to stress to the Committee that this did not somehow make his 'life easier' and that an accelerated programme that delivered two years ahead of schedule was a tangible benefit in itself.
- 3.18 Plans are afoot. Tim O'Toole has proposed that the Waterloo and City Line would be used as a pilot for a full line closure. As a discrete component of the Tube network, the Waterloo and City Line is considered an excellent and relatively undistruptive place to establish whether full line closures can be effectively resourced to accelerate renewal. As Tim O'Toole said, 'if we cannot repair that all in one fell swoop, I am not sure where we can do it'.
- 3.19 This would then provide the basis on which to proceed with full line and branch closures on London Underground's biggest problem – the Northern Line.

²¹ Transcript of Transport Committee meeting 10 March 2005

4. Case Study: The Northern Line

'The Northern Line.. is our most complex line; it is our heaviest ridership; it is the most intensive service we offer, and it is our biggest problem.'

Tim O'Toole, 10 March 2005.

- 4.1 The Northern Line has been the poorest performing line since the PPP started two years ago. Of all nine underground lines, the Northern Line has by the far most signal and point related failures and track delays and the number of trains available for service on the line have been 39 per cent below the agreed benchmark²². The trains and the track aren't working.
- 4.2 Why the Northern Line? One of the major reasons for the poor service can be attributed to a problem that both Tim O'Toole and the Infracos inherited at PPP start up. A previously agreed Public Finance Initiative (PFI) called Connect was established to provide the Northern Line with a new a radio system. The project due for completion at the end of this year will not be commissioned now until June 2007²³. As a consequence of this delay the number of trains available for service has been consistently below adequate performance levels.
- 4.3 The interaction of pervious PFIs with the PPP is by their own analysis 'one of the greatest risk areas' for London Underground. The long-term solution is a new system, provided by Connect, but as Tim O'Toole highlighted to the Committee, 'Connect cannot come in until we are able to get access to all of those rail cars out there and put the radio in the drivers' cabs. That is a very difficult coordination exercise [for London Underground] to go into, and it is a management task that really is on the critical path.'²⁴
- 4.4 The signals and track have also been problematic. A persistent failure in the Angel/Old Street area was causing at least two signal failures a week and was 'driving [LU and Tube Lines] nuts.'²⁵ Consequently, at very short notice, the Bank branch on the Northern Line was closed for an unscheduled three weekends in a row. Since the work has been carried out, failures along that stretch of the line have been stopped.
- 4.5 The problem is wider than one particular signal and lies with the track structure itself. Hence, London Underground is considering proposals from Tube Lines to accelerate work on the line via branch and partial line closures along the whole line.
- 4.6 The proposal to reorganise the renewal of the Northern Line is laid out in seven stages. Tube Lines hopes to gain access to one particular stretch of the line for a two-month period to pilot their project management and engineering work to establish whether wider closures could be contemplated along the Northern Line. There is a lot to consider. The southern stretch of the line between Morden and Kennington is very important to London Underground and carries a large ridership. The central section of the line is also inherently complicated with the City and Charing Cross branches.

²² Page 19, Managing Director's Performance Report to the Underground Advisory Panel, January 2005

²³ TfL Board Papers, 18 May 2005, Report 4, Paragraph 4.12

²⁴ Transcript of Transport Committee meeting 10 March 2005

²⁵ Transcript of Transport Committee meeting 10 March 2005

- 4.7 It remains to be seen whether the proposals are feasible and the acceleration achievable. If implemented, the proposals would represent the greatest departure from the PPP contracts as well as the greatest test to date as to how flexible and responsive the contracts are to the needs of both engineers and passengers.
- 4.8 The Transport Committee offers its conditional support for the proposed line and branch closures along the southern sections of the Northern Line. The closures appear to represent a necessary intervention.
- 4.9 This support is conditional. The Committee seeks, from both Tube Lines and London Underground, reassurances that the timetabling of the Northern Line closures will be planned with careful consideration given to the commissioning and implementation of a new radio system on the Northern Line so that the inconvenience to passengers of both pieces of work can be kept to within the same timeframe.
- 4.10 In addition, these closures should not come to represent a template for clawing back of any future failures of the PPP. The PPP was designed with the specific intention that whole chunks of London would not be left isolated by line closures because such closures have obvious far reaching impacts for the communities affected – not least the daily inconvenience of using alternatives.
- 4.11 Any changes to the contract must not provide potential incentives for future line closures. And perhaps most importantly, the benefits enjoyed by Tube Lines from the improved engineering conditions should be felt across all of their three lines. The Committee would expect an accelerated renewal of the Northern Line but it would also expect to see tangible improvements to other aspects of Northern, Jubilee and Piccadilly Line performance.

5. Future Solutions & Risks

- 5.1 Apart from the proposed line closures there were other risks to the success and public perception of the PPP disclosed to the Committee. Not least of which is the power supply PFI that has the potential significantly to hold up the renewal of the Tube and cost London Underground money at the same time.
- 5.2 If the power PFI is not delivered to the tube system, not only would work on renewal be held up but also London Underground would still have to pay the Infracos for engineering work, because ultimately the power failure could be attributed to London Underground's management of this PFI. There is also a resource risk inherent in the management of these relationships. For example, there is limited signalling expertise available across the system and this resource could be pulled in two directions between previous PFI arrangements and current PPP contracts.

Service Changes

- 5.3 London Underground is also consulting on proposed changes to the late night running of their weekend service. The changes if implemented would see the last trains on London Underground departing central London at 1.30am but the first trains on Saturday and Sunday not arriving in Central London until 7am and 8.30am respectively.
- 5.4 These changes will affect the Infracos access to the lines over the weekend and as they are changes to the service parameters in the original PPP contracts, alterations to the contract will have to be agreed prior to any service changes being made. Not surprisingly, there is a negotiation to be had between the Infraco and London Underground to establish the value of the lost and gained hour over the weekend. Here too is another potential test to the durability of the PPP contracts.

Infrastructure Improvements outside of the PPP

- 5.5 London Underground has recently been given an additional £1bn to carry additional infrastructure work on the Tube. None of the Infracos were invited to tender. Such a development was hardly surprising. London Underground had become frustrated, describing negotiations around additional work beyond the PPP contract as a 'very constrained, single source environment'.²⁶ Extra work needed at Wembley Park was eventually given to Tube Lines but the time pressures of the wider stadium project left London Underground with little option but to give the work to Tube Lines.
- 5.6 The decision to offer additional infrastructure work to companies outside of the PPP does have its risks. As seen with the PFI arrangements on the Northern Line and the power supply, a further fracturing of delivery mechanisms does expose London Underground to greater risk in managing the interaction between non-PPP and PPP work.
- 5.7 However, as the House of Commons Transport Select Committee concluded in its investigation on the PPP, it also offers the PPP Arbiter, who will re-price PPP work in 2010, with an alternative template by which to set a new and presumably better informed price for the PPP work to be carried out beyond 2010. The

²⁶ Transcript of Transport Committee meeting 10 March 2005

development also potentially further motivates the Infracos to improve on their own performance should further non-PPP work become available.

‘The Cavalry’ - Could PPP deliver more?

- 5.8 An article in the Guardian in February made public for the first time the dissatisfaction felt by London Underground by the slow rate of progress being made on renewing the Tube and improving service. Tim O’Toole complained that ‘the programmes [need] to be much more aggressive – and that is all about resources. They [the infracos] know what they are doing; they could accelerate these programmes, it is just a question of resources. These guys are supposed to be the cavalry, but so far they’re the same world-weary infantry we saw under London Underground.’²⁷
- 5.9 Speaking to the Committee, Tim O’Toole and the then Metronet Executive Chairman, John Weight and Tubeline’s Chief Executive Terry Morgan, insisted that the article did not represent a breakdown in the relationship between London Underground and the Infracos. Nothing said in the article hadn’t already been said in regular meetings between client and supplier.
- 5.10 London Underground’s concern is that the Infracos will be tempted to take assets up to renewal date in 2010 rather than risk overspending on maintenance in the short term. The case put forward is not just, according to Tim O’Toole, the familiar lament of a frustrated customer who wants more money. There is a case to be made for accelerated investment. The Infracos and, more importantly their partner companies such as Ferrovial, Bechtel, Balfour Beatty, and Bombardier, need more aggressively to make the case for the business model by investing more now, to prove critics wrong and ultimately to secure the confidence of the government and get more money for further improvements of the Underground.
- 5.12 Major track renewals are primarily back ended until the latter stages of the 7.5 year period. Rather than simply maintain the lines until then, more money spent now bringing forward the line upgrades and track renewals will create a change in service that the ‘public can truly embrace.’²⁸ London Underground want ‘more block joint replacements, so we do not have signal failures, if they do more relay replacements, if they do more track wire replacements – all things they are doing – but if they do them at a greater rate, the performance will improve.’²⁹
- 5.13 To this end, London Underground have submitted a total of 33 requests for additional heavy maintenance works on track, signalling and rolling stock which the Infracos are currently considering. London Underground explained that by the very nature of the contract, LU is ‘not in a strong position’ to demand more from the Infracos³⁰. Ultimately, the responsibility for work actually assigned within the contracts rests with the Infraco and their shareholders. It is they who decide how and when they meet or exceed performance benchmarks.
- 5.16 Tim O’Toole cited the Piccadilly Line as an example of where extra investment pays dividends in improved performance. An extensive overhaul of the fleet, way beyond the expectations of the PPP contract, has seen the Line become the

²⁷ The Guardian, Monday 21 February 2005

²⁸ Transcript of Transport Committee meeting 10 March 2005

²⁹ As above

³⁰ Letter to Lynne Featherstone, 13 May 2005, See Appendix J

‘workhorse of the fleet...shooting the lights out on its [performance] numbers.’³¹ And Tube Lines highlighted to the Committee investment that should accelerate improvement in the mid-term. A new £10 million training centre at Stratford is due to be complete this summer, which amongst a wide range of courses, provides training for signalling engineers for which there has been a shortage of expertise to cover the extensive renewal programme.

- 5.17 However, the National Audit Office (NAO) found that the incentives to improve performance operate ‘only at the margins of their profitability and it is therefore difficult to determine the extent to which they impact shareholder behaviour.’³² Although the NAO add that poor Infraco performance could damage their reputation with potential lenders, the PPP contract appears weighted to militate against failing to hit targets rather actually encouraging exceeding targets.
- 5.18 For example, in monitoring train availability which is measured in lost hours for the customer, the contract rewards an extra £3 for every customer hour gained above the contract benchmark; however it punishes the Infraco £6 for every lost customer hour beneath the benchmark and a further £9 an hour when performance reaches an unacceptable level. The performance benchmarks have been set at a relatively modest level, which explains the discrepancy between bonuses and fines. Whilst the consequence of this pricing structure may not be to actually discourage exceeding benchmarks the PPP doesn’t appear to actually encourage the Infracos sufficiently to ‘shoot the lights out’.³³

Beyond the Contract

- 5.19 For work beyond actual contractual specifications, London Underground described the Infracos as ‘slow’ to address work requested on Accessibility and Step-Free issues, though both have shown a willingness to respond to these requests recently, with Tube Lines highlighting to the Committee that an additional 25 feasibility studies were being carried out at stations. London Underground also pointed out that requests for additional work to assist with the Northern Line’s Connect PFI (see paragraphs 4.2-4.3) and improvement works to operational accommodation have also met with slow responses.
- 5.20 Tube Lines however highlighted to the Committee that additional, extra-contractual work has also been carried out on the construction around Wembley Park and Heathrow Terminal 5 as well as extra work also being undertaken at Waterloo East and North Greenwich.³⁴
- 5.21 Metronet too provided the Committee with a snapshot of 20 projects, valued at approximately £70 million, which were examples of where the Infraco responded to requests for work London Underground for work not specified in the contract.

Should the Infraco’s invest more?

- 5.22 As much as passengers and London Underground might reasonably expect an accelerated rate of renewal on the Tube, unfortunately, they are not entitled to it. The contract is as clear as a contract with 181 performance targets can be. It is

³¹ Transcript of Transport Committee meeting 10 March 2005

³² National Audit Office – Are the PPPs likely to work successfully? 17 June 2004

³³ Transcript of Transport Committee meeting 10 March 2005

³⁴ Letter to Lynne Featherstone, 30 March 2005, See Appendix J

after 7.5 years when the performance of the infracos has to be judged and a slow start was built into the projections over the first 7.5 year period.

- 5.23 However, this is a narrow view. **The Transport Committee offers its conditional support for Tim O'Toole's call for an accelerated rate of investment from the Infracos in renewing the Tube.** The PPP appears to be set up so as to militate against failure and minimise risk, but there is scope for a more aggressive pursuit of excellence. An acceleration in investment, if correctly managed, would be in the long term interests of everyone concerned – the Tube would be improved for its operating company London Underground; the Infracos would not only secure greater bonuses and dividends for its shareholders, but also make a stronger case for further government investment; and passengers would enjoy the benefit of a modernised underground sooner.
- 5.24 But for the Transport Committee it is not 'just a question of resources.'³⁵ Any greater investment needs to be properly managed. Metronet's management of its two PPP contracts has been acknowledged, even by Metronet's own shareholders, to have been inadequate. Until there is a greater demonstration of being able to manage the renewal of the Tube within the current projections, it cannot be reasonably expected that shareholders will license an even greater level of investment and exposure to risk. It is a frustrating Catch 22 for London Underground. Until infraco performance is improved, greater investment may not be forthcoming. However, performance may only improve if there is greater investment. **It is vital that the new management at Metronet quickly demonstrate its ability to improve performance and meet targets within current levels of investment.**

The Transport Committee therefore demands that by the end of 2005 that Metronet's station refurbishment programme is back on schedule.

- 5.25 In addition it is essential that both Metronet and Tube Lines tackle the issue of engineering overruns successfully. Overruns have an almost daily impact on the Tube service and are perhaps more than any other aspect of performance the most indicative of the Infracos' ability to manage the task of renewing the Tube. The Committee understands that the rate of overruns per job has declined for Tube Lines and this is to be applauded. However, absolute numbers measures the passengers' inconvenience and these continue to increase.

The Transport Committee concludes that absolute numbers of engineering overruns must be reduced by the end of 2006.

- 5.26 The Transport Committee looks forward to monitoring the progress of the PPP and will question the new Chair and Chief Executive of Metronet, Keith Clarke and Andrew Lezala, on 21 July 2005, about their immediate plans for Metronet. The Transport Committee will also check on the progress on the PPP in March 2006.

³⁵ Tim O'Toole, Transcript of Transport Committee meeting 10 March 2005

Appendix A – Peak Train Cancellations 2003 & 2004

Year 2003 (6 January 2003 to 2 January 2004)										
	Cause of Cancellation									
	Operator Not Available	Rolling Stock Defect	Signal Failure	Track Defect	Other	Industrial Action	Non LUL	Total	Schedule	per centrun
Bakerloo	78	270	34	34	283		22	721	15,821	95.4per cent
Central	12	1,809	145	4	7,854		46	9,870	35,317	72.1per cent
Victoria	192	77	44	37	92		13	455	18,528	97.5per cent
W & C	1	54	20	0	136		0	211	2,008	89.5per cent
District	153	518	200	71	97		83	1,122	38,641	97.1per cent
Met	36	356	247	69	130		112	950	22,061	95.7per cent
Circle	194	571	124	36	54	28	21	1,028	7,054	85.4per cent
H& C	129	316	81	21	45	18	41	651	7,791	91.6per cent
E L	17	16	3	1	0		1	38	3,014	98.7per cent
Jubilee	24	89	269	36	105		44	567	23,589	97.6per cent
Northern	104	280	162	24	2,155		120	2,845	45,381	93.7per cent
Piccadilly	45	777	197	34	539		100	1,692	38,156	95.6per cent
All lines	985	5,133	1,526	367	11,490	46	603	20,150	257,361	92.2per cent

Year 2004 (5 January 2004 to 7 January 2005)										
	Cause of Cancellation									
	Operator Not Available	Rolling Stock Defect	Signal Failure	Track Defect	Other	Industrial Action	Non LUL	Total	Schedule	per cent
Bakerloo	32	182	56	45	309	46	49	719	16,030	95.5per cent
Central	4	849	147	5	253	125	133	1,516	36,559	95.9per cent
Victoria	10	54	60	34	65	45	31	299	18,934	98.4per cent
W & C	1	19	12	0	18	3	8	61	2,048	97.0per cent
District	31	147	188	91	68	130	119	774	39,441	98.0per cent
Met	17	311	194	21	98	53	69	763	22,916	96.7per cent
Circle	12	104	97	38	36	28	23	338	7,194	95.3per cent
H& C	16	81	65	20	39	20	55	296	8,106	96.3per cent
E L	18	14	2	0	0	0	1	35	3,080	98.9per cent
Jubilee	42	105	136	0	45	97	49	474	24,794	98.1per cent
Northern	83	300	172	90	389	126	49	1,209	46,395	97.4per cent
Piccadilly	68	173	246	32	480	237	206	1,442	38,943	96.3per cent
All lines	334	2,339	1,375	376	1,800	910	792	7,926	264,440	97.0per cent

Appendix B – Guardian Interview with Tim O'Toole

Tube chief: private firms not up to the job

The Guardian, Andrew Clark and Ed Vulliamy, Monday February 21, 2005

It is the cacophonous start to a Londoner's day: loudspeaker announcements about signal failures, delays, defective trains and faulty escalators – the perennial ordeal of the tube. Everything was supposed to change under a unique partnership between the private and public sectors, central to the New Labour project, introduced in 2003. But the turnaround is running late and its estimated time of arrival remains in doubt.

In his strongest critique to date, the man whose charge it is to ensure the day-to-day running of the tube has attacked his partners in the private sector for parsimony, an aversion to risk and a failure to deliver.

Tim O'Toole, the American millionaire freight train executive brought in by Ken Livingstone to head London Underground, says in an interview with the Guardian: 'The improvements are not happening fast enough. No one wants to live this way.'

Millions of passengers – paying the highest underground rail fares in Europe or America – would agree. On one day last week, delays were reported on eight of the tube's 12 lines because of a combination of signal failures, a late finish to overnight engineering work and the disintegration of a concrete footbridge.

'If we're not delivering change, we could well see people ask: 'Why are we continuing to pour money into this arrangement?',' Mr O'Toole warns.

The private public partnership, or PPP, under which Mr O'Toole runs the underground was masterminded by the deputy prime minister, John Prescott, with backing from the Treasury. Under the scheme, two engineering consortiums, known as the 'infracos' – Metronet and Tube Lines – won 30-year contracts worth £15.7bn to modernise the tracks, stations and tunnels, thereby splitting the tube's infrastructure from its operation, by London Underground. The private sector was to pay 25 per cent towards the work, government grants 60 per cent and fares 15 per cent. From the companies' point of view, the deal was almost risk-free and guaranteed them 30 years' work with reviews every seven and a half years.

The contract was so complex that it cost the taxpayer £455m in lawyers' and consultants' expenses just to draw it up. The deals are unique, untried and unproven in the world of transport; they are performance-related, so the companies are recompensed according to their success in reducing service delays.

Mr O'Toole admits that progress is being made – but far too slowly. 'The fact that things are better than two years ago is damning with faint praise, because we are dealing with a system which was well below standard. I don't want to be judged by the old London Underground performance. We have got to get a lot better.

'I am asking for the programmes to be much more aggressive – and that is all about resources. They [the infracos] know what they are doing; they could accelerate these programmes, it is just a question of resources. These guys are supposed to be the cavalry, but so far they're the same world-weary infantry we saw under London Underground.'

Metronet is made up of contractors WS Atkins, Balfour Beatty, Bombardier, Seaboard and Thames Water; Tube Lines comprises Amey, US construction group Bechtel and troubled logistics firm Jarvis.

Public and private partners offer very different accounts of progress. Tube Lines says instances of asset (equipment) failures have fallen by 32 per cent on its three lines – the Jubilee, Northern and Piccadilly – since the PPP began. Metronet says reliability on the Circle line is up 140 per cent, with improvements of between 22 per cent and 54 per cent on its other lines.

But LU, which uses different benchmarks, says the infracos have frequently fallen short. In particular it cites the Northern line, which has been bedevilled by signal failures and track obstructions.

Mr O'Toole lists the shortcomings. The contractors, he says, have failed to spend enough on plant and equipment, such as machines to grind the track and tampers to deal with ballast. He adds that under the Kafkaesque contracts it can be cheaper for the infrastructure companies to keep the tube shut when night engineering work overruns than to pay penalties for imposing temporary speed limits.

In an aside about the infracos' headline grabbing tactics, Mr O'Toole refers to Metronet's trumpeted purchase of a specially adaptable Land Rover able to run on tracks with ultrasonic equipment. 'That's great, but we need more than just a one-car show.

'They are making a level of progress in rolling stock and track structure, but they are not making that level of progress in signals. They are worse, and could get still worse unless something is done about it.'

Metronet's and Tube Lines' profits are healthy. Last autumn, Londoners were told that during their first full year of operation the consortiums earned profits of almost £2m a week between them while losses on the tube network soared.

Metronet reported profits of more than £50m, while Tube Lines announced an annual profit of £41m. Metronet chairman John Weight was paid a salary of £325,000, while Terry Morgan of Tube Lines hauled in £552,000. Losses on the tube had climbed 15-fold from their 1998 figure, from £50m to £756m in 2004.

Tube Lines makes no apologies for its surplus. Mr Morgan says: 'We're a business. I don't know of any successful business which doesn't have an objective of achieving a profit.' Insisting that overnight engineering work had quadrupled over two years, he says: 'Like Tim, I always want to do more than we're already doing – I don't think that's unreasonable. But, on this whole question of being like the old London Underground, you would not believe how untrue that is.'

Mr O'Toole is unrepentant, insisting that the profit motive leads to cost-cutting: 'The standard practice is to cut costs. But I'm saying that this is not the way to do things now.

'We see all the press releases from these companies about how well they are doing ... I think the public reacts very differently to these announcements depending on the improvements they see. If they can find a way to measure the improvements, they will react one way to the profit announcements. If they cannot, they will react another way.' As Mr O'Toole speaks out, there is increasing restlessness among members of the board of Transport for London, the body that supervises the underground. Susan Kramer, a Liberal

Democrat banker who challenged Ken Livingstone in the mayoral election of 2000, says the system was the result of 'a Labour government enchanted by the private sector'.

She adds: 'It was an absolute lack of understanding of how transport networks function: that they are integrated systems, and that you fragment at your peril. So, while Paris and New York are very well integrated systems, we have fragmentation.'

The negotiation of the contract itself, says Ms Kramer, was one 'between amateurs on the government side against top professionals who really understand how negotiating works', as the infrastructure consortiums brought in crack corporate negotiating teams against what she calls the government's naivety.

'The ethos was: 'We trust the private companies. We forge a partnership with the private companies' - it was so naive. If someone offers a company a really stupid contract to make lots of easy money, are they going to walk away from it?'

In 1999, three academics at the London School of Economics posited an alternative plan for funding the impoverished underground which argued for a bond issue, like that used to fund the subway in New York. The notion was rejected at the time but since then London Underground has been urged to issue bonds to fund future projects.

One of the authors, now at Imperial College, is Stephen Glaister, who sits on the TfL board and says of the PPP: 'The idea was for a partnership in which we were all going to be best friends, to which we said at the time: 'You've got to be joking.' It was completely naive to talk in terms of partnership.'

The infrastructure firms, says Prof Glaister, 'were able to do what they did because the government was so committed to the PPP, and therefore over a barrel. You have got to be prepared to walk away from a negotiation to make it work - but they were clear to the infracos that they were not going to walk away from it.'

At the end of this month, the Commons transport select committee is expected to make robust criticisms of the consortiums, and their profits. A Labour member of the committee, Brian Donohoe, who is a part-time transport police officer on the underground, says the consortiums are 'milking it for all they are worth, for no significant improvement. It is now blatantly obvious that we were right and the government was wrong.'

Metronet, the bigger of the two PPP contractors, roundly rejected such criticisms. Its chief executive, John Weight, said: 'I do understand why every customer wants things better, quicker, faster and cheaper. But there is a lack of recognition of what this contract is.'

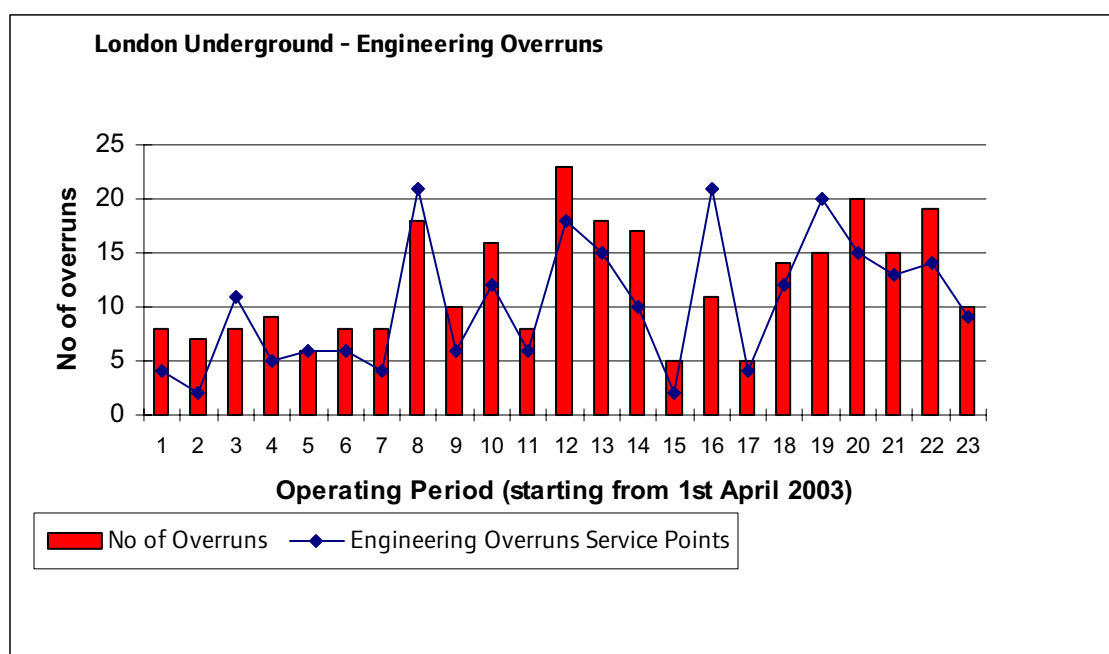
He insisted that the ambience, cleanliness and reliability of trains had improved over the last two years. He added that it was 'crap, quite frankly' to suggest that private firms made financial judgments to keep overnight engineering works running into the rush-hour.

But criticism persists. The PPP scheme cost the taxpayer £1.1bn during its first year. 'And the result,' says Christian Wolmar, historian of the underground, 'is that while Londoners will eventually get a better tube, it will have come much slower and at a much greater cost than if it had been done in the conventional way.'

'The result is an expensive mess, a reduction in accountability, an apparent black hole for taxpayers' money and few benefits for passengers.'

Appendix C - Engineering Overruns on the London Underground

Operating Period	No of Overruns	Engineering Overruns – Service Points
1(4 weeks from April 1st 2003)	8	4
2	7	2
3	8	11
4	9	5
5	6	6
6	8	6
7	8	4
8	18	21
9	10	6
10	16	12
11	8	6
12	23	18
13	18	15
14	17	10
15	5	2
16	11	21
17	5	4
18	14	12
19	15	20
20	20	15
21	15	13
22	19	14
23	10	9
Total	278	236



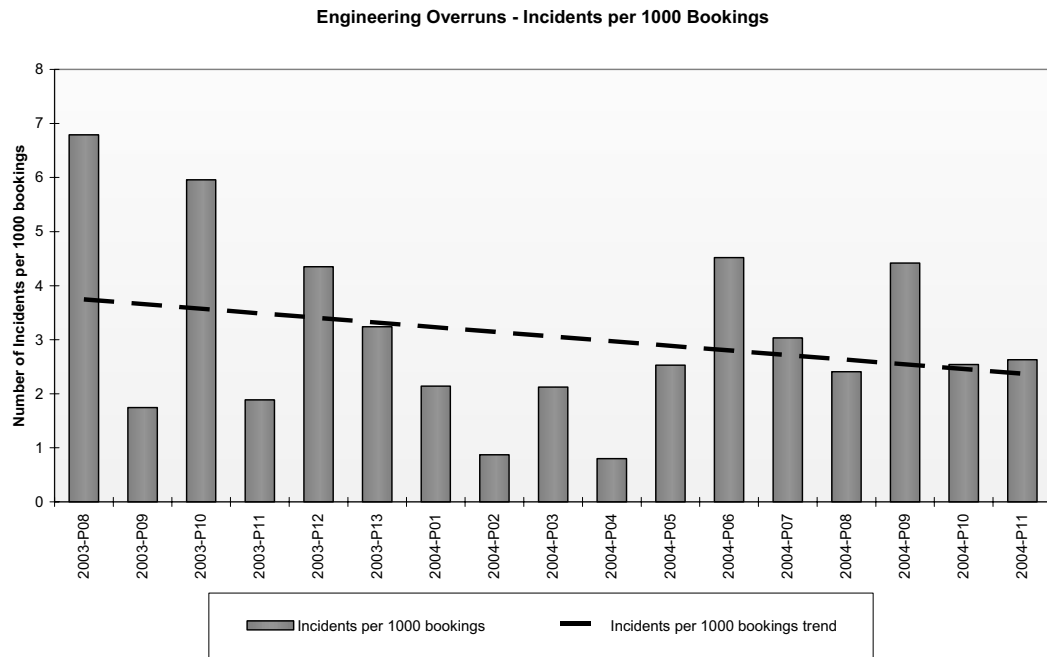
Appendix D – Tube Lines Memo on Engineering Overruns

Tube Lines' memorandum to the London Assembly Transport Committee on engineering overruns

1. Tube Lines does not have a significant problem in relation to engineering overruns.
2. While investment has increased since transfer, and the number of bookings – individual slots of time in which engineering work is carried out – has risen, the number of overruns has remained relatively stable.
3. The table below shows the number of incidents of overruns in the past year, set against the number of bookings. On average, less than 0.3 per cent- 3 in every 1000 – bookings has resulted in an overrun.

4 week period	Count of Incidents	No of bookings	Incidents per 1000 bookings
2003-P12	10	2298	4.352
2003-P13	8	2471	3.238
2004-P01	5	2335	2.141
2004-P02	2	2302	0.869
2004-P03	5	2353	2.125
2004-P04	2	2500	0.800
2004-P05	6	2371	2.531
2004-P06	11	2434	4.519
2004-P07	8	2637	3.034
2004-P08	7	2906	2.409
2004-P09	13	2942	4.419
2004-P10	5	1968	2.541
2004-P11	7	2661	2.631

4. The graph below shows the underlying trends in relation to overruns. The black line shows that the number of overruns relative to bookings is declining.



5. The Committee might like to note that there have not been any overruns associated with recent weekend line closures. There have been 18 weekend closures since autumn 2004 of the Jubilee Line associated with work to enlarge Wembley Park station and three weekend closures of the Bank branch of the Northern Line for track work in February and March 2005: not a single one of these has suffered an overrun.
6. We would be happy to provide further information if this would be helpful.

Appendix E – Metronet evidence to the London Assembly

Review of Metronet performance during its second year, 2004/5 to date

Introduction

Metronet is responsible for the multi-billion upgrade and renewal of two thirds of the London Tube. As part of a Public Private Partnership with London Underground, Metronet is upgrading nine of the 12 lines, and is investing some £17 billion in the project. This review of Metronet's performance covers the eleven four-weekly 'periods' from 1 April – 5th February, 2005, during the second year of its 30-year programme.

Metronet Rail BCV Ltd., (MRBCV), has responsibility for the Bakerloo, Central, Victoria, and Waterloo & City lines, and Metronet Rail SSL Ltd., (MRSSL), has responsibility for all the sub-surface lines, consisting of the District, Circle, Hammersmith & City, Metropolitan, and East London lines.

Performance overview

Overall, Metronet's performance has developed a positive trend during the year to date of 2004/5 and whilst there is much progress still to be made, a more reliable service to passengers is now becoming evident.

In the case of MRBCV, this business made satisfactory progress on its key PPP commitments despite a challenging period during the first part of the year, both in terms of operational issues and mobilising and fully utilising its supply chain. For MRSSL, performance was positive with the number of adverse incidents reducing across the majority of all its assets. Train performance was 45 per cent better in terms of Availability year on year with the 'mean distance between failures' rate improving. Since acquiring responsibility in April 2003, the total number of Lost Customer Hours attributed to MRSSL as a result of delays, breakdowns and other incidents, has been halved.

The Bakerloo line continued to deliver strong asset performance building on the successes achieved during 2003/4. The total number of incidents related to the Central line continued to fall during the period and the overall Availability score improved on the line. To date train reliability on this fleet is almost 140 per cent better than when Metronet acquired responsibility in April 2003. However, Availability was affected by three individual incidents, including the slow speed derailment at White City, the root causes of which are being addressed. Generally, Availability on the Victoria line has been steadily improving and in the last two periods the rolling average was 16 per cent better than at Transfer in April 2003.

The loss of two engineering possessions during 2004 for the repair of a collapsed section of drain at Victoria hindered the track renewal plan, but taken overall, and with a consistently good delivery from MRBCV, the track programme to date during 2004/5 is ahead by 0.5 km.

Good asset performance earns Metronet bonus payments and reflects successful delivery of its PPP contractual obligations. Poor performance incurs penalty payments, reduces customer satisfaction and has an adverse effect on Metronet's reputation. An increasingly strong asset performance, exceeding contract benchmarks, is therefore a critical element of Metronet's strategy.

Highlights in the year to date

- Number of fleet incidents reduced by 29 per cent in MRSSL and 22 per cent in MRBCV – resulting in less passenger disruption
- Reliability of Bakerloo line trains improved by 13 per cent (since April 2003)
- Reliability of Central line trains improved by 140 per cent (since April 2003)
- Reliability of Victoria line trains improved by 72 per cent (since April 2003)
- Reliability of Waterloo & City line trains improved by 23 per cent (since April 2003)
- Reliability of Circle line trains improved by 145 per cent (since April 2003)
- Delivered three additional Central line trains for peak service
- Delivered two extra Victoria line trains for off-peak service
- Delivered three additional Metropolitan line trains for service
- Continued to deliver all train fleets graffiti-free, each day
- 13 station modernisation/refurbishments started
- More than 13 kilometres of track renewed (23 km since April 2003)
- Robust measures in place, and continuing, for the cold weather season – Metropolitan line trains have been modified to improve the effectiveness of track de-icing

Maintenance of the Tube

Metronet has committed investment of approximately £295 million during 2004/5 to maintain and keep safe the assets under its stewardship. Typically, maintenance activities only ensure that the asset keeps working in a safe and efficient manner before capital investment replaces that asset with more reliable, more efficient and safer products.

Considerable resource has been diverted by MRBCV to ensure track remains in good condition – through enhanced lubrication, track and tunnel cleaning, and rail grinding. The main focus of MRBCV's station maintenance is around lifts and escalators – and it is seeking better performance from contractors to improve 'down-time'.

For MRSSL, 80 per cent of all signal failures occur in just three locations: King's Cross to Farringdon, Baker Street to Finchley Road and Wimbledon to East Putney. Metronet's 'Operation Sponge' is targeting these areas to ensure leaking water mains and sewers are resolved (Metronet works closely with Thames Water, one of its shareholders), and that drainage is improved along with track insulation.

Very good progress is being made by MRSSL in replacing signalling track wires to reduce service delays caused by signalling faults. Half the track wire failures took place between Aldgate and Barking. These have all been replaced.

Passenger delays on the north side of the Circle line are being reduced through the trial introduction of specially-coated electrical switches which resist failure. Studies are also analysing and addressing the loss of train conductor rail shoes and 600V AC signal main link boxes are being replaced.

Recent improvements in the 'mean distance between failure' rates has been striking – with a direct resulting benefit in the reduction of passenger delays and disruption.

MRSSL continues to keep its promise of removing all internal train graffiti within 24 hours and all external graffiti within 48 hours. It is also pioneering the use of a sacrificial film applied to train windows to frustrate vandals. Traditionally the only way to remove scratch graffiti was to replace the window. The new film is scratch-resistant and can be replaced with relative ease.

Investment for renewal of the Tube

Refurbishment and modernisation work is now underway at 13 stations. Construction work at two of the first stations, Chigwell and Bow Road, will be completed within the next few weeks. There has been some slippage in the overall programme, partly due to the time taken in attaining design approvals and agreeing the full scope of stations works with London Underground. Metronet is confident that the slippage can be attributed to mobilisation and 'learning-curve' issues. It has a recovery programme in place which will eliminate the current slippage by the end of 2005. In all, improvement works to 45 stations are expected to have either been completed or commenced by the end of 2005. Modernisation work to one of the largest stations, Oxford Circus, was started in November 2004 with the £55 million project due for completion in 2008.

Towards the end of 2004, a Strategic Programme Director, reporting directly to the Chairman, was appointed for assuring the delivery of the capital programme.

To further strengthen this programme, three senior managers were also appointed in the areas of track, stations and civils, and rolling stock and signals – with a revised accompanying organisation that bridges the formerly separate MRBCV and MRSSL capital programme directorates.

Overall, more than 13 km of new track has been laid in the year to date, which is 0.5 km ahead of schedule. In all, more than 23 km of new track has been renewed since transfer of two-thirds of the Tube to Metronet in April 2003 – which is more than 10 per cent of the 200 km track renewal programme scheduled for completion during the first 7.5 years.

A £70 million engineering upgrade and refurbishment programme on the Central line fleet, together with the close-out of all Chancery Lane inquiry recommendations, has enabled MRBCV to increase the reliability of that fleet by 140 per cent. Planning and development for the major Victoria line upgrade continues to gather pace with a number of milestones achieved during the period. Production of the prototype of the new fleet of Victoria line trains began in January 2005 – and these constitute the first part of a £3.4 billion investment by Metronet in 237 new trains together with accompanying signalling systems.

Production for the first fully refurbished and re-styled District line trains continued during the period. Metronet is extremely disappointed that this programme is running approximately 12 months late. However, Metronet's contractor, Bombardier, is confident that there is still sufficient scope within the overall programme to finish the complete order to time. The first of these refurbished trains is scheduled to re-enter service within the next few weeks, subject to testing, and when production reaches its optimum cycle, a newly refurbished District line train will re-enter service approximately every 30 days. The refurbishment programme will extend the life of this 26-year-old fleet by eight years, before a brand new fleet enters service.

Engineering over-runs

Metronet is acutely conscious of the severe disruption to London Underground and Tube passengers when engineering works over-run. Metronet has no imperative for works to over-run and completely refutes the suggestion that this might be the case. The type of work typically falls into two categories: i) that which is planned (for example the renewal of track, often programmed many months in advance, yet still vulnerable to unforeseen events, such as plant breakdowns) or work that is considered important for the safe operation of the Tube following routine inspection, and is to be undertaken within a matter of days, and ii) that which is unplanned, typically of an urgent nature, following routine night inspections and considered vital for immediate repair or mitigation prior to the resumption of passenger service. In respect of the latter, the potential can always exist for an over-run.

Safety

Safety remains at the top of Metronet's agenda with a key focus on improving the processes, systems and culture, with the frequency of lost time injuries reducing. During the first part of its second year Metronet appointed Heads of Safety (Operations) in each of its companies to deliver a 'DuPont' approach of a zero recordable injury rate in the capital programme and maintenance departments.

DuPont's 'best practice' safety techniques are being rolled out across all levels of management and management systems within Metronet, with a key focus on safety leadership. Metronet has also initiated a 'Top-Set', best-in-class, investigation system training for staff to ensure a consistently higher quality of investigation and better use of root cause analysis.

A thorough investigation with London Underground established the root causes of the White City derailment in May 2004 and the recommendations are being implemented. In particular, elements of Metronet's management processes were found to be unsatisfactory and steps have been taken to rectify these shortcomings.

In the wake of the Chancery Lane incident, before Transfer to Metronet, depot organisation on the Central line has been radically overhauled by the Director of Fleet.

Metronet has been proactive in lowering the risks surrounding signals passed at danger as a result of equipment failure, broken rails and track fires, targeting known trouble spots. The number of small track fires has been reduced significantly during the current year. For the year to date, there has been 165 track fires; these numbered 256 for the comparable period last year. This result has largely been achieved through vigorous attention to the cleaning of track lubricators, thereby helping to ensure that surplus grease does not act as a collecting point for litter and other debris – together with the introduction of a device to suppress sparks from power collector 'shoes'.

Working in partnership with London Underground

Metronet, Tube Lines and London Underground have all agreed to use a standard software package for reporting project progress. It is planned to 'go-live' with this system at the beginning of April, 2005.

For MRBCV, good progress has been made with London Underground in agreeing cost recovery from the events which followed the Chancery Lane incident and for which

MRBCV had an indemnity at the point of transfer of the network to its responsibility. London Underground is settling all performance code issues with MRBCV, relating to Availability and the penalties suffered. Final agreement has almost been reached on the costs incurred to date in restoring the trains to service and on the extra cost of maintenance which MRBCV will incur until modifications to the bogies are complete.

Additional works have been requested by London Underground at Walthamstow and Shepherd's Bush. For MRSSL, more than 900 minor works projects have been completed at the request of London Underground during the current financial year. The removal of trackside graffiti between Barons Court and Hammersmith is one such example. MRSSL's performance has been good with 96 per cent of projects being completed to the required timescales.

Three larger 'intermediate' works have also been completed by MRSSL to time during the first six months of the year, including a customer information facility at Harrow-on-the-Hill. These works are provided for under the PPP contract but represent an increase in the scope of work that Metronet delivers on behalf of London Underground.

People

The people who work for Metronet have been subjected to significant change since their transfer from London Underground. The management of this change and achieving a transformation in values, attitudes and behaviours is fundamental. During 2004/5, the Company has developed 'The Metronet Way', a strategy founded on a new organisational culture that focuses on performance, achievement and delivery.

The key values of The Metronet Way are enshrined in a Metronet vision for 'Getting London to Work', through a belief in health, safety and the environment, its people, customer service, performance, partnership, and value for money. Metronet's commitment to its customer calls for 'promises to be kept', the creation of 'a great place to work', and a pledge to 'look after the investment'. In the long-term, Metronet aspires to deliver to the passenger 'a great journey every time'.

Leading Change workshops have already been held for some 900 managers to implement this transformation and Metronet is in the process of engaging all 5,000 staff through a series of workshops to which every individual is encouraged to attend.

Financial report for 2003/04

Metronet's financial performance during its first year of operation was in line with expectation and the forecasts contained within the PPP bid. For the year ended 31 March, 2004, the combined pre-tax profit for Metronet Rail BCV Limited, and Metronet Rail SSL Limited, amounted to £50.6 million. Combined turnover for the first year amounted to £599.1 million.

The profits are retained in the business until the conclusion of the first 7.5 year contract period.

The figures secure a robust earnings stream for the two businesses in order to support the very large capital programme for the renewal of the Tube. The full Reports and Financial Statements for the two businesses are available from Metronet's website, www.metronetrail.com.

Appendix F – Tube Lines’ memorandum to the London Assembly Transport Committee on improvements to the network

1. Tube Lines is extremely concerned at the statistics reported in the Evening Standard of 8 March, which do not present a true picture of the capital expenditure and upgrade work completed since transfer.
2. All of Tube Lines’ investment programmes are running on time.
3. On track, in the first 7½ years, we are committed to renewing 63km of track. To date, we have renewed 17.4km, or 28per cent. This figure is roughly commensurate with the fact that we are just under 30 per cent of the way through the first 7½ years. In the last financial year, we delivered 100 per cent of planned track renewal work and this year we are on target to deliver 97per cent.
4. On escalator refurbishments, we delivered 100 per cent of our planned programme in the last financial year and in this financial year we are on target to deliver 120 per cent of the programme. There has been no downward revision and indeed we have initiated a variety of innovations which allowed us to refurbish an escalator at Green Park in 9 weeks 4 days instead of the usual 26 weeks.
5. On lift refurbishments, we have not revised down our plans. Our targets are linked to maintaining good asset condition on the lifts, which need not necessarily constitute a refurbishment. To achieve this, we have adjusted the nature of our programme and are carrying out minor works on 45 lifts this year instead of the major works at six sites as originally intended.
6. On station refurbishments, Tube Lines has completed seven (West Hampstead, Kilburn, Borough, South Harrow, Northfields, Burnt Oak and Arnos Grove) and two more (Kennington and Tufnell Park) are in line for completion by the end of March. The only other station which was scheduled for completion by the end of March – Acton Town – is on hold pending discussions between London Underground and Tube Lines in relation to the addition of a lift for mobility impaired people to the scope of the upgrade.
7. The Committee might also like to note that investment committed to the upgrade of the Jubilee, Northern and Piccadilly Lines has almost tripled since transfer. The amount of work being carried out on site has quadrupled.
8. We would be happy to provide further information if this would be helpful.

Supplementary Memorandum to the London Assembly Transport Committee

1. Tube Lines notes the Committee's request for information on areas where Tube Lines has been able to accommodate a request from London Underground for work beyond that which is outlined in the contract.
2. Tube Lines has accommodated a variety of requests from London Underground to undertake major pieces of work on top of that which is specified in the contract. This includes, among other projects:
 - The enlargement and reconstruction of Wembley Park station, to accommodate spectators travelling to the new National Stadium at Wembley. This work will be completed in late 2005
 - Signalling and other design and enabling work on the Piccadilly Line extension to Heathrow Terminal 5
 - Feasibility studies into the provision of step free access at 25 stations
 - Work at Waterloo East mainline station aimed at preventing water ingress
 - Design work for the provision of additional escalators at North Greenwich station to reduce congestion at the station once the Dome reopens
3. Tube Lines has also accommodated a variety of requests from London Underground to undertake smaller items of work in addition to that specified in the contract. These components of work range from simple jobs, such as supplying additional noticeboards and putting up shelves to more complex jobs such as making provision for on train announcements on the Piccadilly Line fleet and the erection of platform end barriers at a number of stations. On average, Tube Lines responds positively to in excess of 500 requests per year from London Underground for works such as these.
4. In addition, we have put forward proposals in response to requests from London Underground, to set out how engineering work might be undertaken in the event of late running services on Friday and Saturday nights. We have also put forward a proposal on how partial line closures on the Northern Line could be used to bring forward the timetable for various improvement works.
5. As Tim O'Toole explained on 10 March, we have an output based contract. This means that we are contractually obliged to deliver specified improvements in performance and service levels by certain dates rather than to carry out individual components of work at certain times. We have introduced a significant number of innovations to allow us to meet those performance targets quicker and better and to provide improvements to Londoners as soon as possible.
6. We have introduced a variety of innovations to improve safety. For example:
 - Together with Metronet, we have introduced a vehicle-based ultrasonic testing regime which enables us to quadruple the amount of track which it is able to test at any one time.

- We have introduced lightweight tools to reduce back injuries incurred by staff and, through this, reduce the amount of time lost due to injury.
7. We have taken steps to reduce the time taken to refurbish escalators, by improving planning processes and ensuring that more work is completed off site. The normal time taken to refurbish an escalator has been 26 weeks, but we recently carried out a pilot project where we refurbished an escalator at Green Park in nine weeks and four days. We have now reviewed the lessons learnt from this exercise and are seeking to roll out a programme to reduce the amount of time taken to renew escalators elsewhere on the network, starting with the refurbishment of an escalator at Camden Town, which has just begun.
 8. We have sought to increase the amount of work which is carried out during the day, as opposed to during night-time engineering hours, in order to reduce the amount of time needed to deliver improvements, but without having to close stations or reduce the service to passengers. For example, in late 2004, we agreed with London Underground a trial programme of work to carry out painting, cleaning and the provision of increased signage at Leicester Square station.
 9. As part of our strategy to ensure that we have the necessary resources, we work to retain and recruit employees of the highest calibre and we have taken steps to tackle skill shortages in certain areas of the business. We have invested in excess of £10 million in a training centre in Stratford, dedicated to providing a range of courses, 24 hours a day, 7 days a week, from basic safety training for office-based employees to two year advanced technical courses. This will open in summer 2005. The centre will develop partnerships with local educational establishments, boosting opportunities for skills training in the local area.

Within the centre, there will be specialist training school providing two year courses for signalling engineers. The signalling school will have a capacity to train 100 signalling engineers at any one time, with 28 full technical officers completing the course each year. The first engineers will come off the programme in autumn 2006. We believe that this will reverse the long term deficit of signalling engineers which is one of the underlying factors behind signal failures.

10. We invested around £400,000 in putting in place a state-of-the-art control centre at our headquarters in Canary Wharf, which provides the nerve centre for recording and addressing faults on the network, as and when they occur, 24 hours a day, 7 days a week. This centre replaced the old system which we inherited at transfer which was non-dedicated and outmoded.
11. We have invested £30 million in integrating hundreds of processes and IT systems which the company inherited from London Underground, to create a single system which facilitates more efficient asset management, business planning and maintenance of the network. This programme was completed in late 2004.
12. We have modernised the process for pre-empting points failures resulting from cold weather. This was achieved by introducing a helicopter to carry out surveys from the air of all of the heating equipment on the Jubilee, Northern and Piccadilly Lines above ground, to ensure that they were in good working order and to spot areas where repairs were needed, in advance of the winter. As Tim O'Toole acknowledged during the Committee's hearing, the recent cold weather passed without any major disruptions to service.

Appendix H – Metronet Submission to the Committee, May 2005

This is a schedule containing examples where Metronet companies have been able to accommodate a request from London Underground for work beyond that which is outlined in the contract. Whilst it is only a snapshot, the actual list being infinitely larger, I hope it serves to give the Committee an understanding of the diverse nature of these works. I trust it is helpful for your purposes. Please let me know if there is anything further that you may require.

PAUL EMBERLEY

*Director of Communications
Metronet Rail*

Metronet Rail, Communications Department
Templar House, 81-87 High Holborn, London WC1V 6NU, UK

Schedule of example works where Metronet companies have responded to requests from London Underground, beyond the PPP contract


1. Installed platform end barriers to prevent passengers accessing the track. Approximate value £1 million.
2. Expansion of the 'Tracker system' coverage to incorporate sections of the District and Metropolitan lines. Approximate value £3.1 million.
3. Adjustments to train-platform interfaces at 7 stations. Approximate value £0.4 million.
4. Relocation of District line command function from Earls Court to Baker Street. Approximate value £0.5 million.
5. Installation of remote positive train identification and recording facilities at 7 stations. Approximate value £0.6 million.
6. Southern entrance ticket hall works to Euston Square station. Approximate value £4.2 million.
7. New depot facilities, White City development. Approximate value £0.5 million.
8. Provide an upgrade of LV lighting in support of the Connect project. Approximate value £6.7 million.
9. Preparatory/ feasibility works related to the future introduction of a 7th car to Circle line trains. Approximate value £0.5 million.

10. Undertake works related to the provision, installation and maintenance of saloon air conditioning systems on all new sub-surface trains. Approximate value £40 million.
11. Undertake a trial of ground water cooling systems at Victoria station. Approximate value £0.5 million.
12. Provide various works above ground in connection with the White City Development. Approximate value £2.2 million.
13. Undertake CCTV works at Chancery lane station. Approximate value £0.4 million.
14. Provide an extension of Tracker facilities for the Waterloo & City line. Approximate value £0.5 million.
15. Provide an upgrade to security systems for service control rooms. Approximate value £0.4 million.
16. Provide services in connection with the Notting Hill congestion relief programme. Approximate value £0.4 million.
17. Fit out the subway at Walthamstow station. Approximate value £4 million.
18. Provide specialist works to the network customer information display system. Approximate value £0.5 million.
19. Provide ventilation improvements for the Victoria line fleet cabs. Approximate value £3.3 million.
20. Provide site-wide diversions of cables at the White City development. Approximate value £0.75 million.

May 2005

**Appendix J –
London Underground submission to the Committee, May 2005**

Transport for London
London Underground



13 May 2005

Ms Lynne Featherstone
London Assembly Transport Committee
City Hall
The Queen's Walk
London
SE1 2AA

Dear Lynne

Tim O'Toole
Managing Director
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Thank you for your emailed letter of 17 March 2005, requesting some further information following my evidence to the Committee on 10 March. I am addressing this letter to you as I understand that you wish to conclude this piece of work prior to departing the GLA Transport Committee. Please let me also congratulate you on your election as a Member of Parliament.

You asked for a "list of examples where the Infracos have been unable to accommodate a request from London Underground for work beyond that which is outlined in the contract".


This discussion goes to work of a nature contemplated in the PPP contracts, which is discussed below, and work beyond that referred to in the contracts. With regard to the latter, by way of example, the Infracos were slow to address work we requested on Accessibility and Step-Free access, on some improvement works to our operational accommodation, and the Connect PFI Enabling works. More recently, Tubelines has come forward to meet our requirements on Accessibility work and Metronet has indicated a similar willingness.

As for the work contemplated in the contracts, it is useful to remember that the contracts are output-based, meaning that it is for the Infracos to decide which work they do in order to meet, or exceed, the performance benchmarks in the contract.

This contractual situation means that If LU wishes to specify something, especially on maintenance issues, we are not in a strong position. If we wish for specific works to be undertaken, we can request this but it is ultimately at the Infracos' discretion whether or not to do it. In general we expect the Infracos to act on our guidance.

Cont...

MAYOR OF LONDON



Registered office is at above:
Registered in England and Wales,
Company number 1903907
London Underground Limited is a
company controlled by a local
authority within the meaning of
Part V Local Government and
Housing Act 1989. The controlling
authority is Transport for London

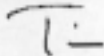
If we wish to specify works to achieve an output not covered by the contract, we have to negotiate costs in a very constrained, single source environment. This is the main reason why we have set up an alternative supplier framework for works outside the PPP contract.

I attach a summary of the areas of heavy maintenance works that we have formally submitted to the Infracos, which follows months of discussion with them on these topics.

My call to both Infracos to put more resources into maintenance and renewals reflects the situation detailed above. LU is, I believe, entitled to expect more from the Infracos, and I shall continue to focus my efforts on securing the maximum possible return.

I hope that this information is helpful to the Committee.

Yours sincerely

A handwritten signature consisting of a stylized 'T' followed by a horizontal line.

Maintenance Works that LU has proposed to the InfraCos in order to improve performance of the railway

A Track

1) Targeted Improvements in Asset Conditions

- a) Improve Condition of Bolted Rail
Fully inspect and overhaul all dipped running rail joints and where necessary repair the immediate track support.
- b) Improve condition of P&C
Undertake a "one-off" joint Track and Signal inspection of the junctions and complete all necessary adjustment and repair work of the junctions and adjacent track.
- c) Improve Rail Conditions - Re-railing
Undertake re-railing where high accumulated tonnage and/or poor condition of rail or rail end increases risk of defects.
- d) Improve Rail Conditions – Grinding
Undertake rail grinding where the rail head shape is poor or the running surface heavily corrugated.
- e) Improve Rail Stress Levels
Undertake prevention of buckling measures to bring rails and records into compliance with standards.

2) Preventative Maintenance

- a) Improved inspection and maintenance of blockjoints
Establish special teams to routinely inspect, clean and tighten all blockjoints and examine signal cable connections to the running rails.
- b) Improve Front Line Maintenance
Provide additional labour to support patrol staff on key patrol routes, duties to include litter clearance, switch blade greasing, swarf clearance etc.

3) Improved Management of Faults

- a) Improve Accuracy of Information Regarding Location of TRV (Track Recording Vehicle) Detected Faults
Install equipment on TRV to more accurately report location of faults and install compatible location markings on the track.
- b) Improve Quality of Repairs
Increase the scope of repair work undertaken on track geometry faults to improve the durability of the repair. Ensure that all

temporary repairs (usually by ERU) are followed up with a full scope repair.

- c) Planning
Plan ultrasonic testing in areas where it is likely that chronic defects will be found at off-peak times (eg weekends) to minimise operational impact.

4) **Reduced Risk of Engineering Over-runs**

- a) Pre-Work Preparations
Devise and implement arrangements that will ensure that prior to starting any planned works involving replacement of track components the site is checked and staff are fully briefed, with a full specification and methods statement for the work available; with the correct materials, plant etc and contingency arrangements are in place.
- b) Deployment of Tools and Equipment
Additional strategic spares and plant/tools should be deployed at suitable locations for use in emergencies – these must be subject to a regular inspection.

5) **Improve Collection and Use of Asset Information**

- a) Improve Quality of Maintenance Work Specifications
Deploy competent technical support to assist with the preparation of specifications for the work identified as necessary by the routine condition monitoring inspections.
- b) Improve Quality of Failure Analysis
Employ additional competent resources on the root cause analysis of failures and the effectiveness of asset maintenance strategies.

B Signalling

1) **Incident Management**

Improved processes and escalation arrangements, so that Technical Officers dealing with failures can quickly gain advice or authorisation to make special adjustments to the signalling system. Apply more formal techniques for basic root cause analysis to establish the causes of failures in a timely manner.

2) **Training**

To counter the on-going loss of critical signalling resources, skills and knowledge improved training capacity to be provided. Comprehensive and up-to-date documentation for safety critical task definition and training purposes is needed to improve awareness of staff in the field, and support refresher training.

- 3) **Track Quality**
The reliability of Insulated Rail Joints (IRJ's), track circuit connections and rail bonds, and point mechanisms should be addressed on a system basis as 'track' quality and the state of the wheel/rail interface has a significant impact on critical signalling assets.
- 4) **Independent Review**
Independent Review (IR) within the Infracos of all signalling failures is imperative for the assurance of the safety and reliability of the signalling system.
- 5) **Inspection and Task Monitoring**
The level of inspection and task monitoring should be increased, to provide assurance that 'house keeping' is effective, assets are in an acceptable condition, and that standards and work instructions are being complied with.
- 6) **Risk Based Maintenance**
More science should be applied to maintenance activities to make them 'risk based'. Including applying techniques and validating/revising existing standards that are currently based on historical time based intervals.
- 7) **Power Supplies**
Install un-interruptible power supplies to reduce risks to the service from power failures affecting, for example, the computer based control systems on the Piccadilly, Jubilee and Metropolitan lines.
- 8) **Points**
Review existing point mechanisms and consider other new options, that lend themselves for easy installation onto the replacement rail requirements of Track and ease of maintenance and the installation of remote monitoring type processes.
- 9) **Spares**
Review spares holdings and location for signalling equipment, focusing on both network-wide and specific equipment, under tight configuration control. TO's should also carry with them specific emergency repair equipment to enable "first-aid" to be administered more rapidly.
- 9) **Condition Monitoring**
Exploit remote condition monitoring of critical items, so that the onset of certain classes of failure can be identified and corrected before a service-affecting failure actually occurs.
- 10) **Design Standards**
Address risks associated with old design standards, notably Compromised Overlaps and single point failures

11) Wire Degradation

Address degradation of safety wiring in equipment rooms, track-side boxes and kiosks, replacing all wires presenting a credible risk as fast as possible.

C Rolling Stock

- a) Implement close working arrangements similar to the Central line across all fleets
- b) Ensure trains are clean, and in a good condition
- c) Arrange joint working groups between Fleet and Operations for each line to improve rolling stock incident handling and incident response (e.g. train recovery, push outs etc)
- d) Implement a robust quality management system for all overhauled or new components from contractors and suppliers to address quality issues with repaired spares.
- e) Fleet management to increase supervisory/local audit actions on all its maintenance staff to ensure full compliance with maintenance procedures.
- f) Infracos to increase own internal independent fleet and depot audits or other appropriate action to increase the level of assurance of maintenance and asset condition to the Rolling Stock Engineer, as well as consistent quality of performance.
- g) Acceleration of compliance with the Competence Assurance standard to improve competence of staff and help with the maintenance assurance process.
- h) Implement a robust quality management system for all overhauled or new components from contractors and suppliers to address quality issues with repaired spares

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