



# London Underground and the PPP: Data Summary 2006/07



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## 1.0 Introduction



This document presents a summary of performance information on the London Underground Public-Private Partnership (PPP) contracts for the financial year 2006/07.

The PPP contracts are among the largest and most complex private finance arrangements in the UK public sector, and the performance of the PPP has been of considerable public interest. This report sets out a summary of the key performance indicators and data used by London Underground to monitor the performance of the infrastructure companies (Infracos) in delivering their contractual obligations. The JNP Infraco and contract was awarded to the Tube Lines consortium, while the Metronet consortium won the BCV and SSL Infraco contracts. The report summarises data covering three areas; contractual performance, maintenance and asset performance and renewals and upgrades.

A brief description of the measures summarised in each of the chapters follows.

### 1.1 PPP Contractual Performance Measures

In contrast to input-specified contracts, the PPP contracts are predominantly output-based with specified outcomes founded on an extensive performance regime that uses bonuses and abatements to provide financial incentives.

The principal contractual measures are:

- **Availability:** a measure of day-to-day reliability based on whether assets are available for service
- **Capability:** a measure of what the assets are capable of delivering in terms of capacity and reduced customer journey time
- **Ambience:** a measure of the quality of the travelling environment.

Each of these measures has a contractual benchmark level, with bonuses being available for better performance and financial penalties (abatements) charged if performance is worse than benchmark. An implicit expectation within the PPP is that performance will improve over time and earn Infracos bonuses. Benchmark performance represents a minimum, rather than 'world class' performance.

The data in chapter 2 summarises Infraco performance against these three contract measures and a fourth, Service Points, which are levied for failure to meet certain obligations such as avoiding engineering overruns.

**Availability** is a reliability measure reflecting whether assets are available for customer service. The measure counts delays and disruptions lasting more than two minutes and takes into account the duration, location and time of day of the disruption to estimate the total cost in terms of customer time. This is expressed as 'lost customer hours' (LCH). For example a two-minute delay at Victoria in the morning peak costs significantly more lost customer hours than a two-minute delay on a Sunday evening in the suburbs. At signature the PPP contracts were set at approximately 5% worse than historic performance for the first year of the contract, becoming more challenging in subsequent years.

Whereas availability is about day-to-day performance, **capability** is a longer-term measure

of the potential capacity of the assets to reduce the journey time experienced by the customer. Improved capability can be achieved through having more trains, or faster trains (through train or signalling systems), or trains with more capacity, or some combination of these as the Infraco determines. The PPP contracts set out requirements for significant improvements in capability on all lines. Mostly these are due in the second 7½ year contract period, reflecting the long lead times involved in procuring new trains and signalling. However, there are targets for some lines in the first period, and the Infracos themselves may make capability improvements at any time, for example by increasing the effective fleet size available for service (through more efficient maintenance and management of spare trains) or by addressing the causes of certain speed restrictions that act as constraints on line capacity.

Customer surveys consistently show that tube customers value the quality of their travelling time as well as the reduction in the quantity of time taken. The **ambience** measure reflects this by measuring the quality of the travelling environment on trains and in stations based on a quarterly Mystery Shopping Survey (MSS) conducted by an independent accredited survey organisation. The survey assesses various aspects of the service, including: the condition of train seats, cleanliness of surfaces and train exteriors, levels of litter and graffiti, public address audibility, ride quality and in-car noise; lighting, train heating and ventilation; quality of signage, and condition of toilets and waiting rooms. The benchmarks were set at levels better than historic LU performance and apply at Infraco rather than line level.

**Service points** are allocated for failures by the Infracos to meet certain contractual obligations, typically:

- Facilities faults: failure of customer facing assets such as CCTV, public address systems, train arrival indicators or help points
- Fault rectification: failure to fix certain problems such as litter and spillages, defective escalators, pumps and drains within the standard clearance times set out in the contract
- Engineering overruns: failure to return the railway for operational use on time following engineering work.

For the first two categories each Infraco has a service point threshold, above which abatements are charged. The threshold for engineering overruns is zero reflecting the severe effects these events have on customer service.

## 1.2 Maintenance and Asset Performance Measures

The performance of key assets such as track, rolling stock, signalling, and escalators is critical to service reliability and drives the availability measures. The Infracos' maintenance activity will directly impact asset performance, and the data chapter 3 summarises performance across four key asset groups (rolling stock, signalling and control systems, track, and lifts and escalators) to provide an insight into the Infracos' maintenance performance.

Industry standards are used rather than contractual metrics. **Rolling stock** performance is measured in Mean Distance Between Failure (MDBF). **Signalling and control systems** and **track** are judged on the average duration of delays greater than 2 minutes

due to failures. The performance of **lifts and escalators** is measured in both the average fix times and the time between failures.

### 1.3 Renewals and Upgrades

The Infracos' renewal and upgrade programmes are essential to improving the legacy of historic under-investment in the Tube. The final chapter presents the Infracos' renewals performance across four major areas: track, lifts and escalators, stations and line upgrades.

**Track renewal** involves reconditioning of the track bed, ballast and sleeper as well as replacement of the rails. The length of track renewal is presented in kilometres in this data summary and provides a summary of actual versus target renewals completed.

Similarly, the actual rates of **lift and escalator** refurbishment and replacement are compared to the levels anticipated by Infracos in their bids.

The **station enhancement programme** is intended to bring all stations up to standard in terms of asset condition, décor and customer facilities. For some stations refurbishment is sufficient, whilst others require more extensive work in the form of enhanced refurbishment or full modernisation. Performance is compared to contractual completion dates.

The PPP contract sets out requirements for **line upgrades** across all lines by 2020, with the majority due in the period 2009-15. The final chart in this summary outlines the delivery timetable and the expected increase in peak capacity.

### 1.4 Further information

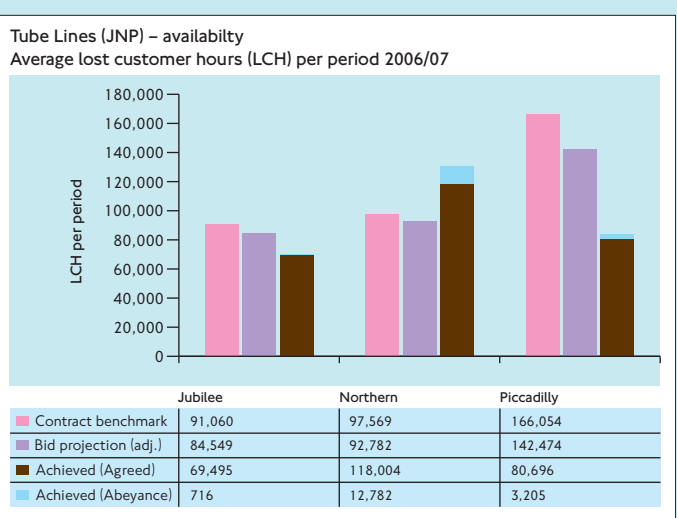
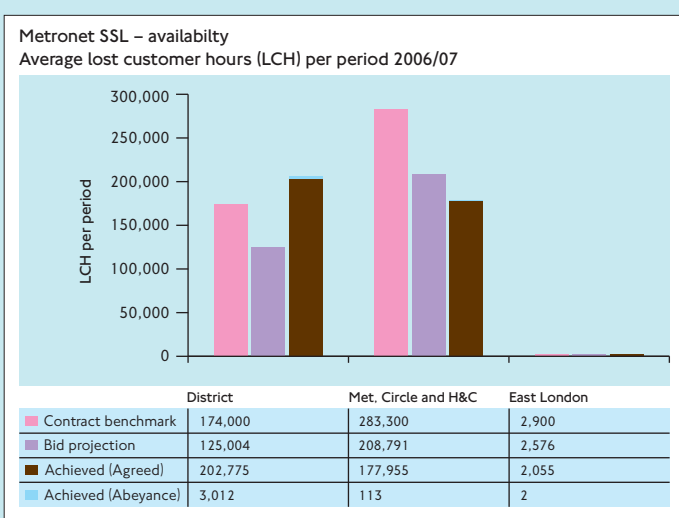
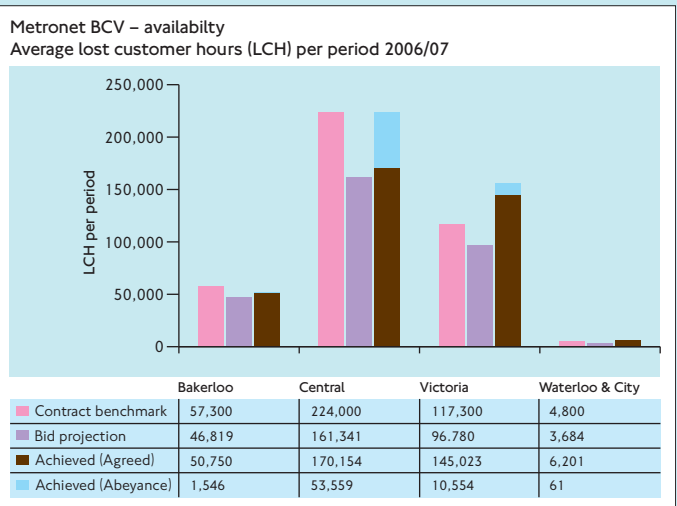
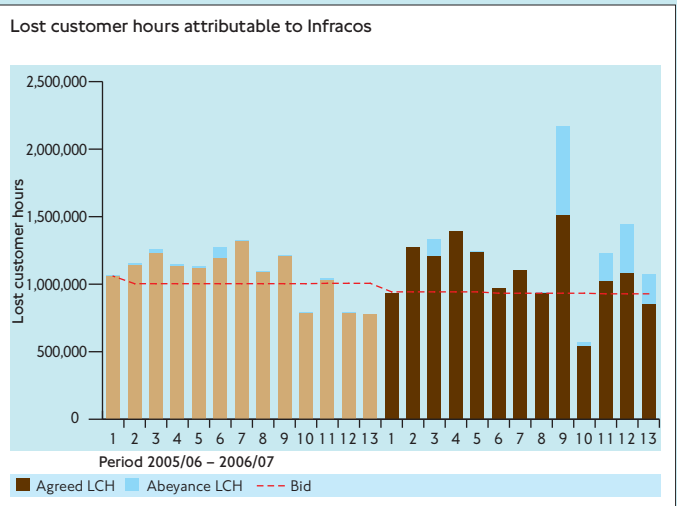
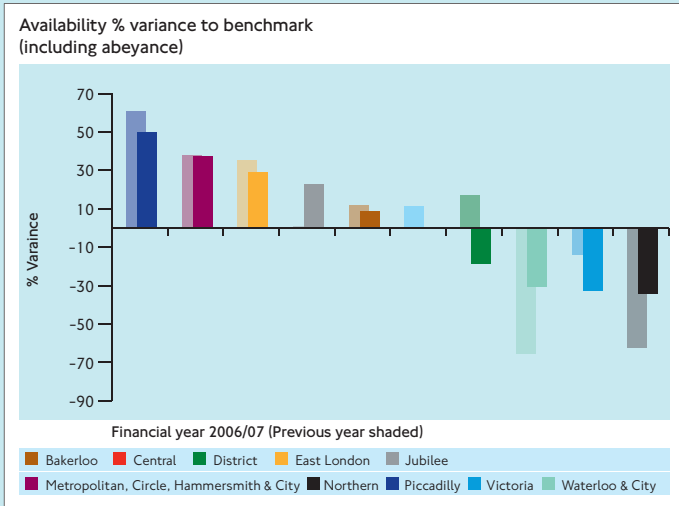
The data in this report is for the year ending 31st March 2007. This pre-dates the PPP Administration of the Metronet Infracos in July 2007.

The TfL website ([www.tfl.gov.uk](http://www.tfl.gov.uk)) sets out further information on the London Underground PPP.

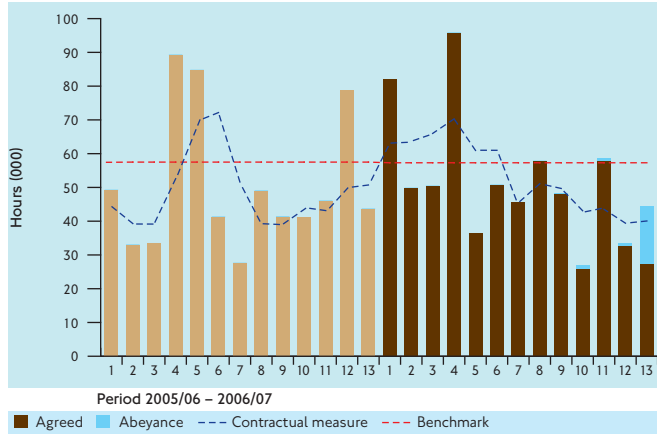
# 2.0 PPP contractual performance



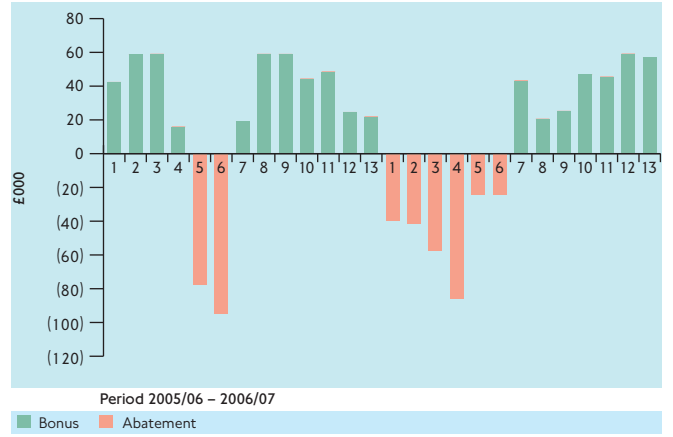
## Availability



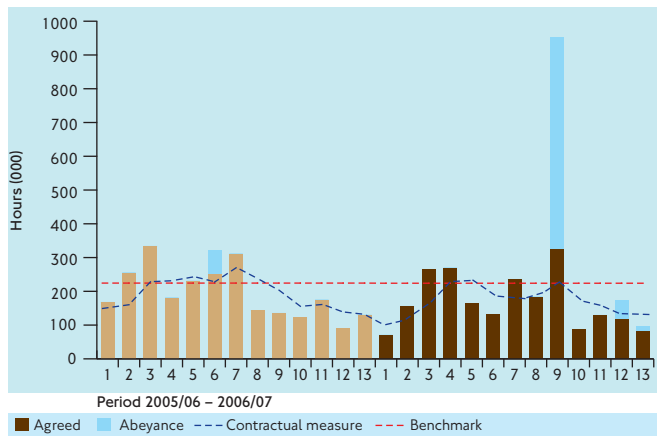
**Bakerloo line**  
Lost customer hours (000)



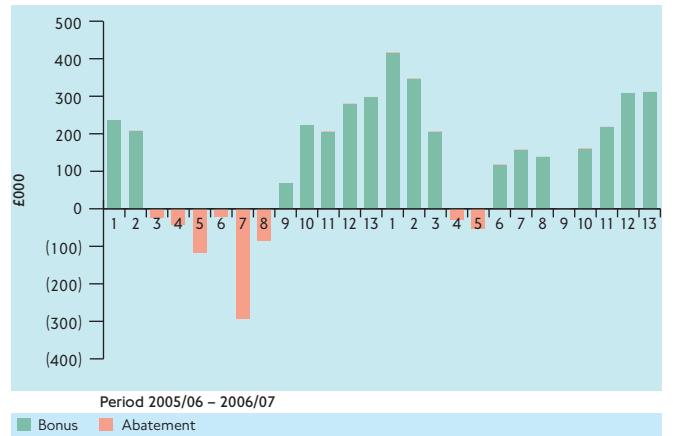
**Bakerloo line**  
Bonus / (Abatement) £000



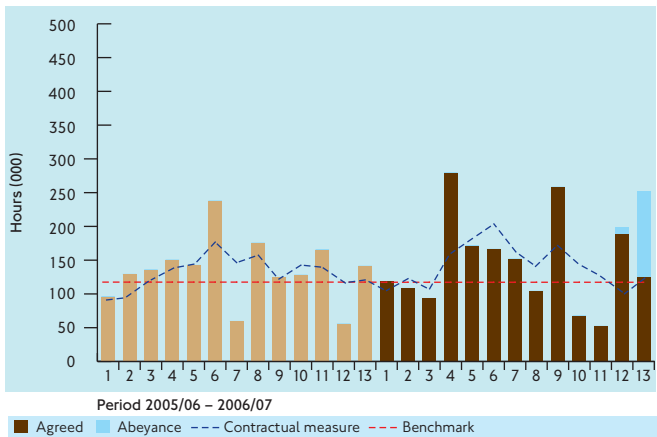
**Central line**  
Lost customer hours (000)



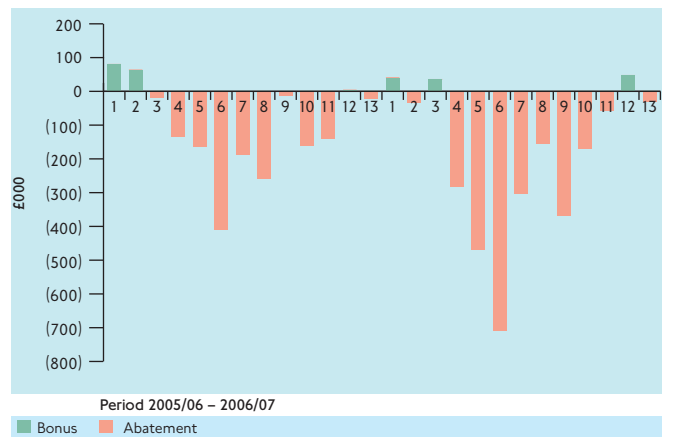
**Central line**  
Bonus / (Abatement) £000



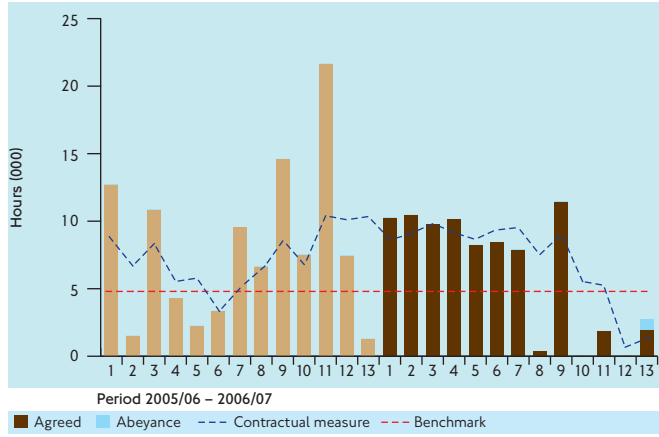
**Victoria line**  
Lost customer hours (000)



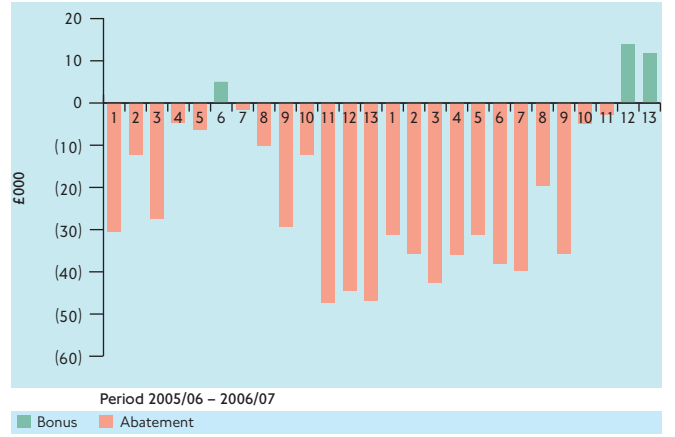
**Victoria line**  
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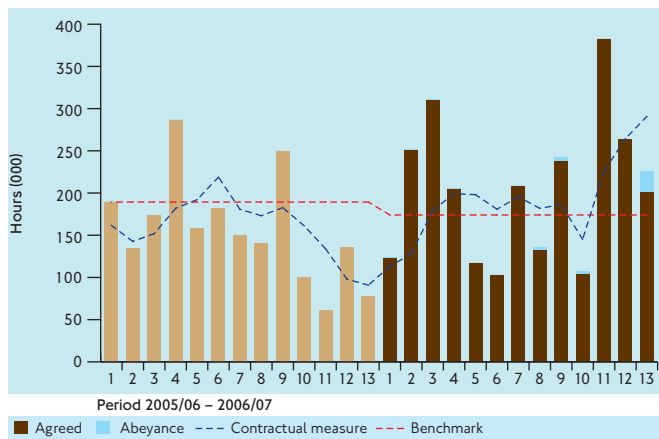
**Waterloo & City line**  
Lost customer hours (000)



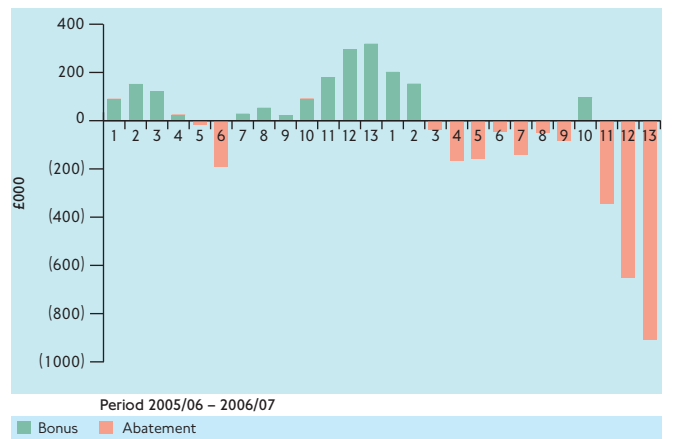
**Waterloo & City line**  
Bonus / (Abatement) £000



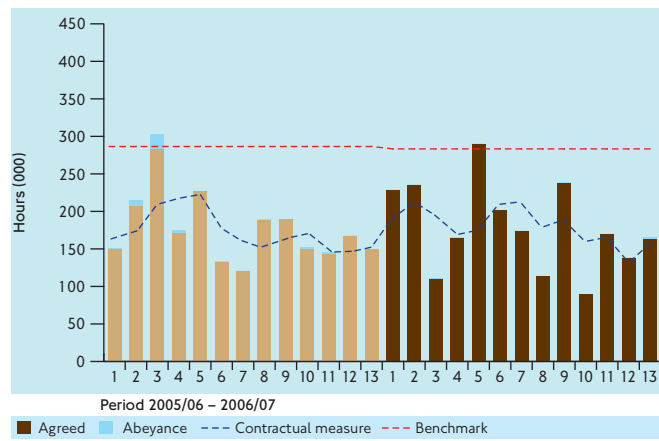
**District line**  
Lost customer hours (000)



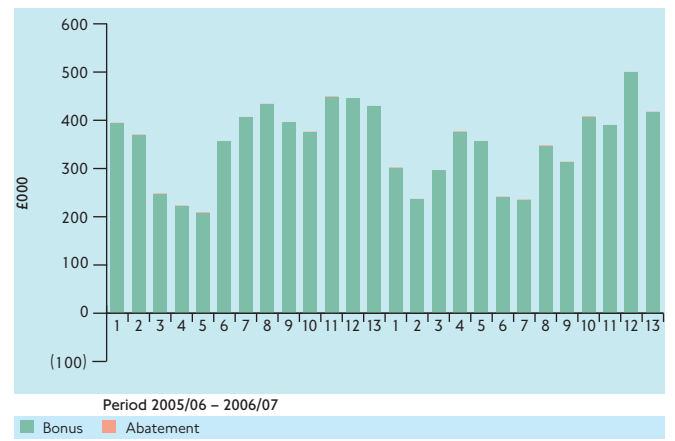
**District line**  
Bonus / (Abatement) £000



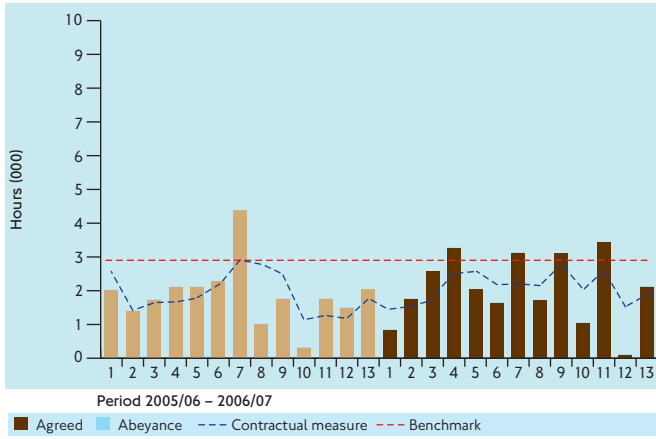
**Metropolitan, Circle and Hammersmith & City lines**  
Lost customer hours (000)



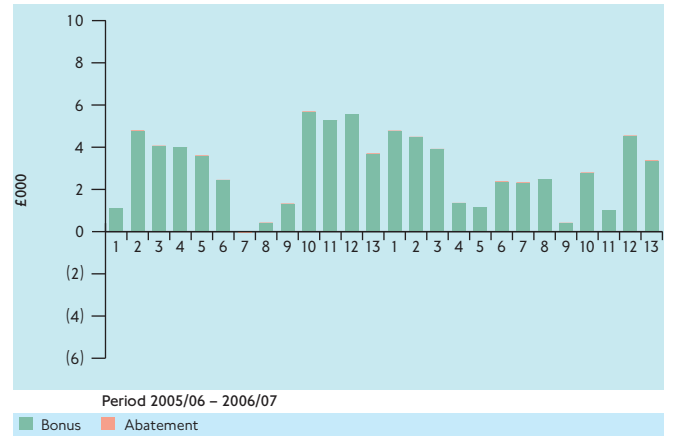
**Metropolitan, Circle and Hammersmith & City lines**  
Bonus / (Abatement) £000



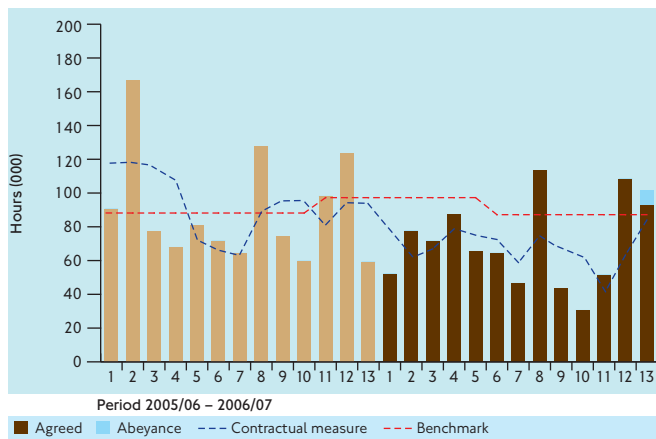
East London line  
Lost customer hours (000)



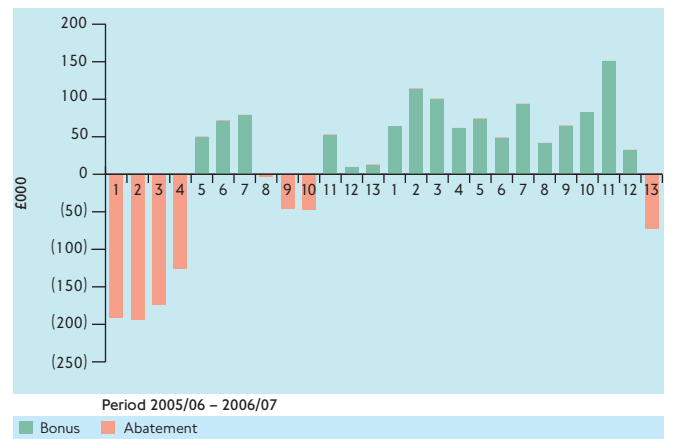
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Bonus / (Abatement) £000



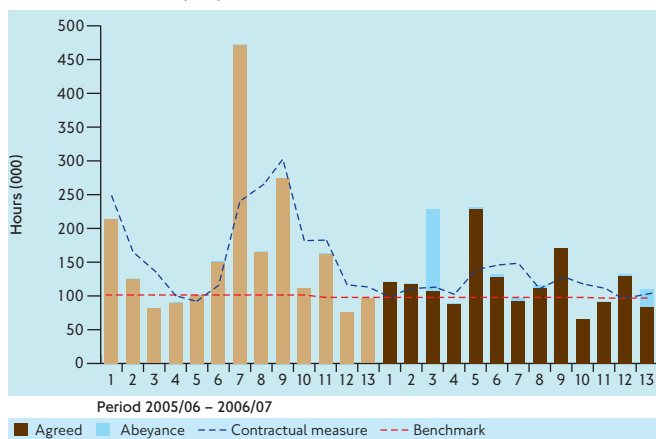
Jubilee line  
Lost customer hours (000)



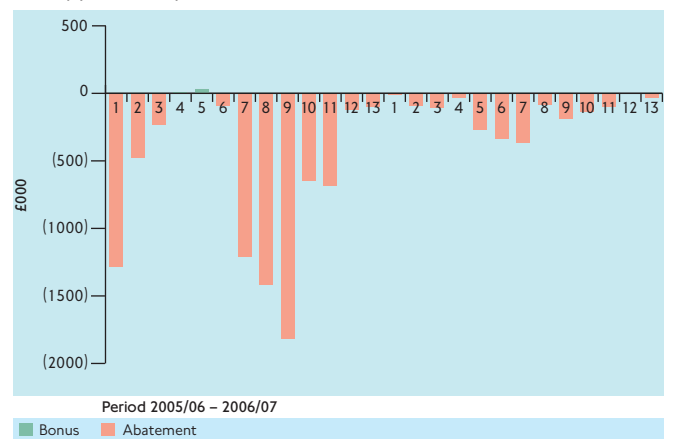
Jubilee line  
Bonus / (Abatement) £000



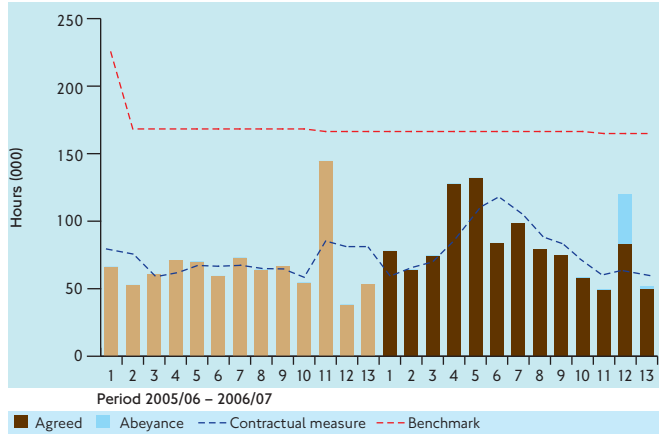
Northern line  
Lost customer hours (000)



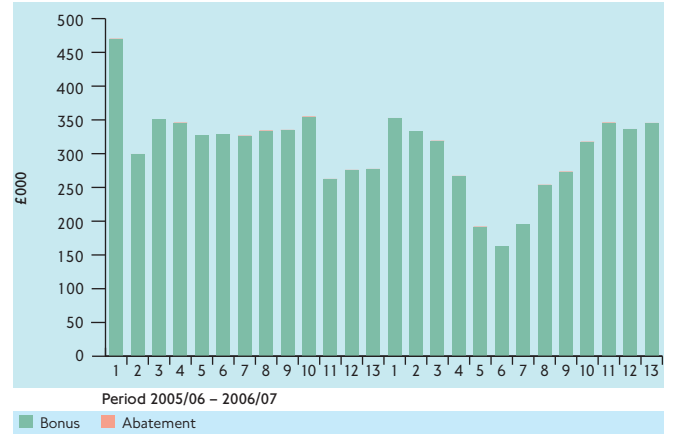
Northern line  
Bonus / (Abatement) £000



Piccadilly line  
Lost customer hours (000)

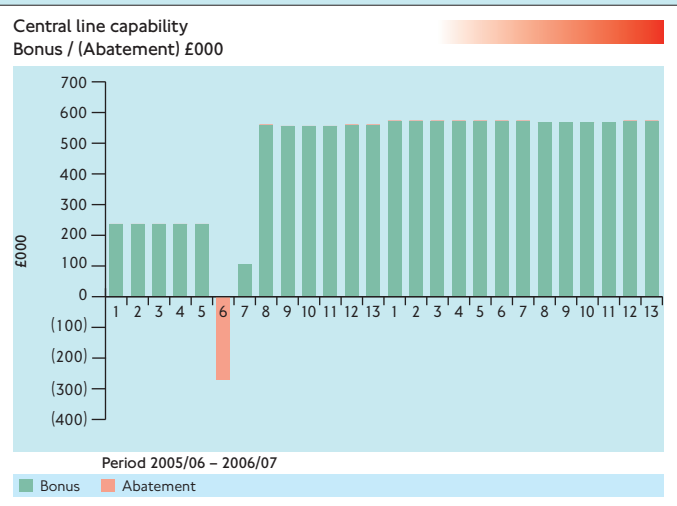
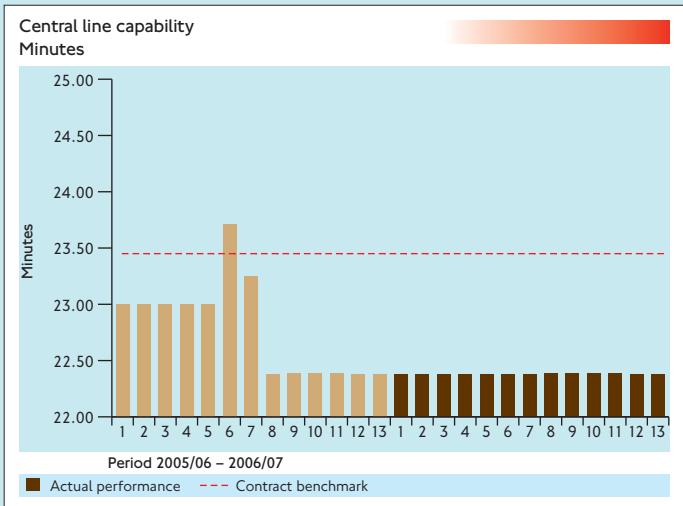
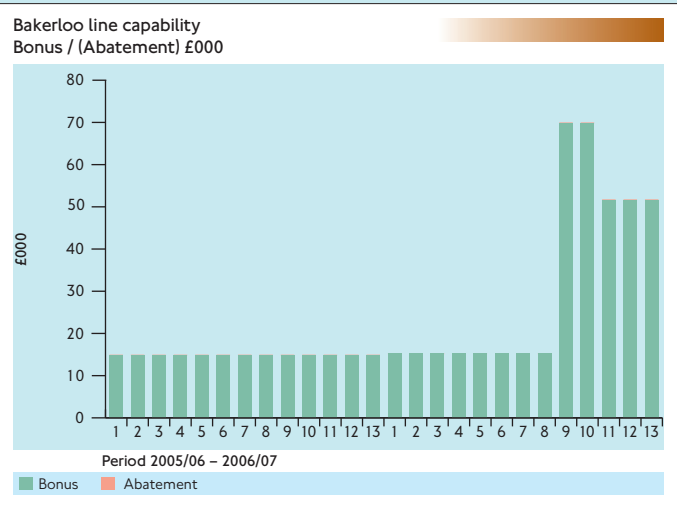
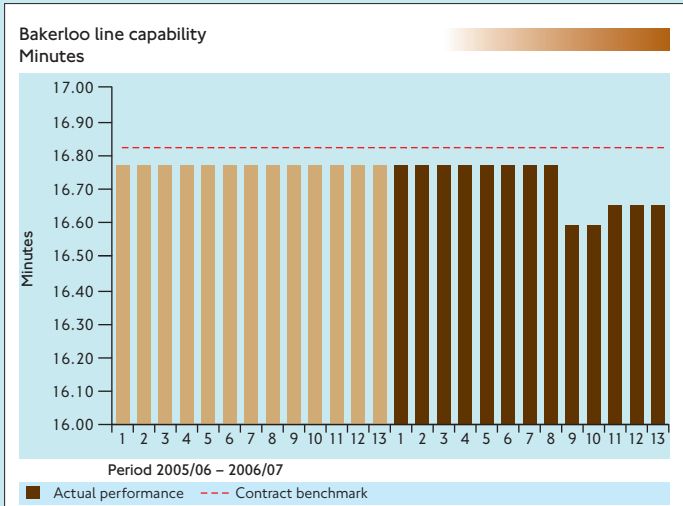
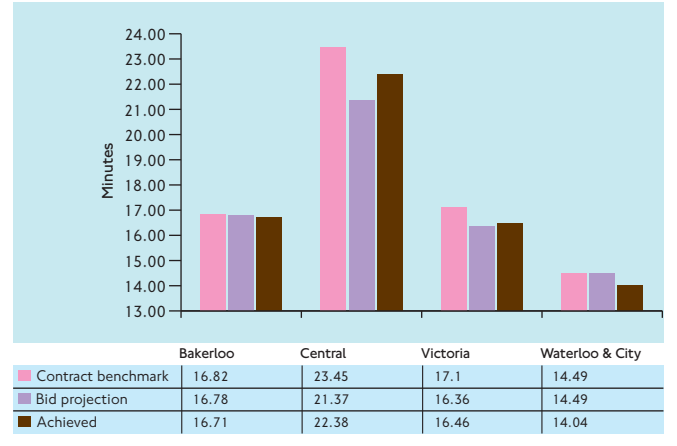


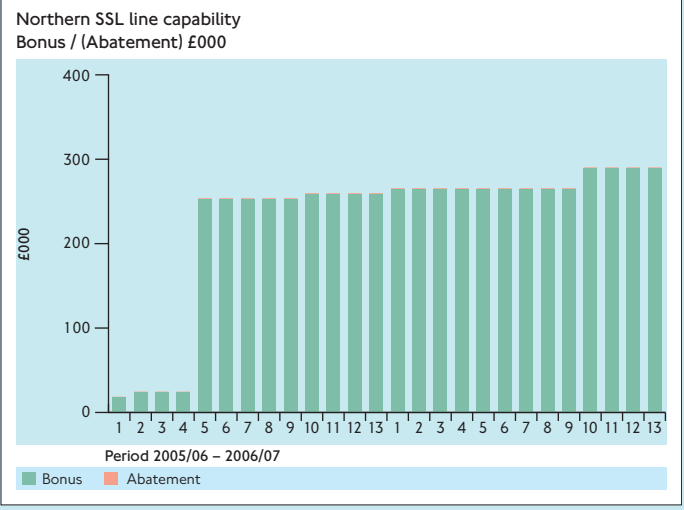
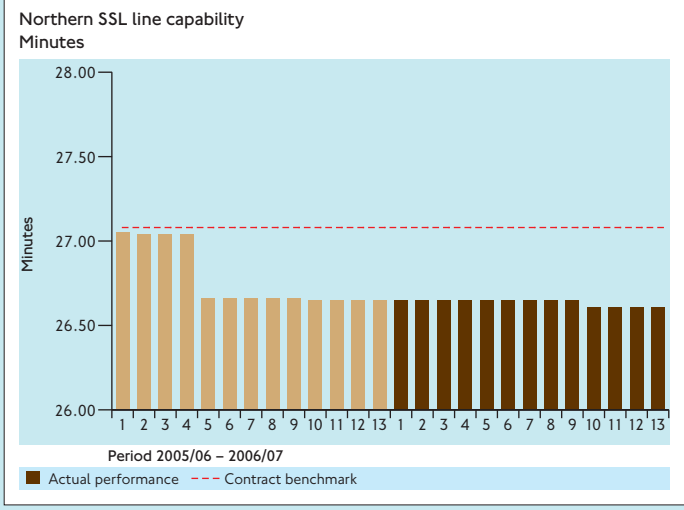
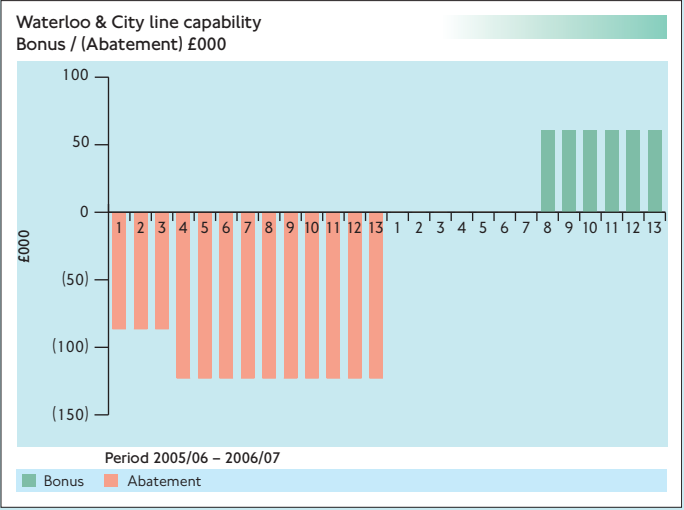
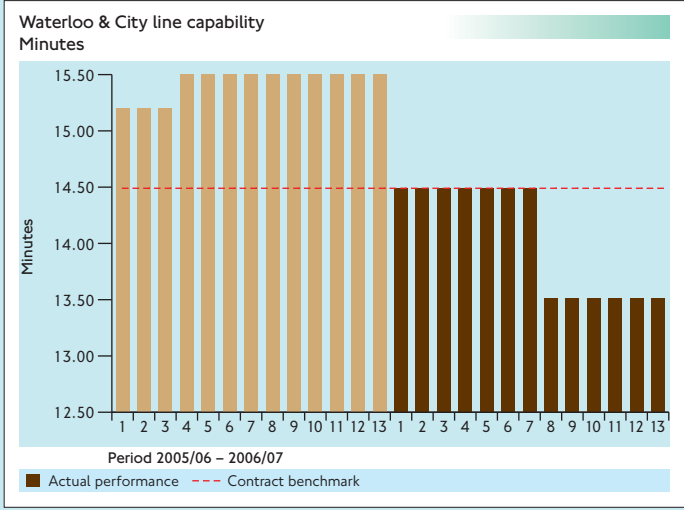
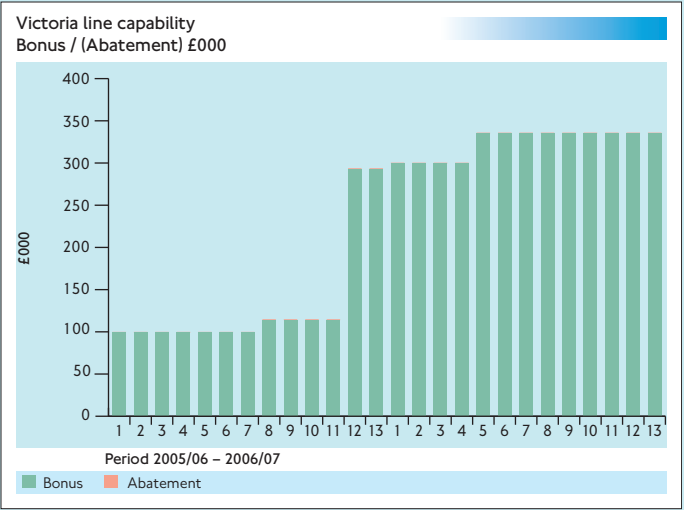
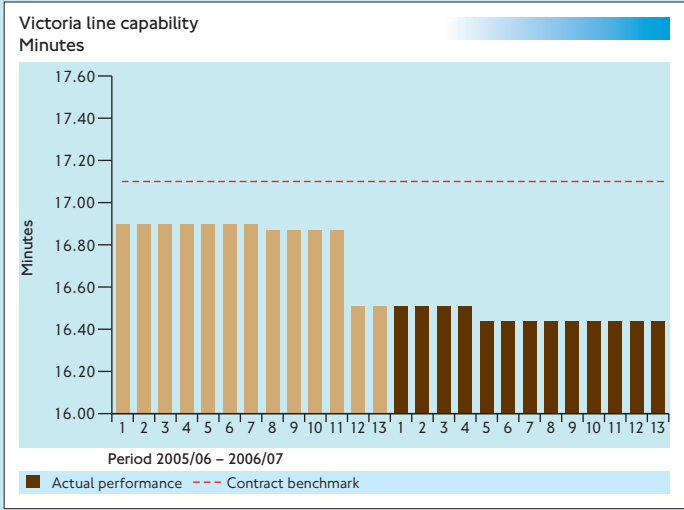
Piccadilly line  
Bonus / (Abatement) £000



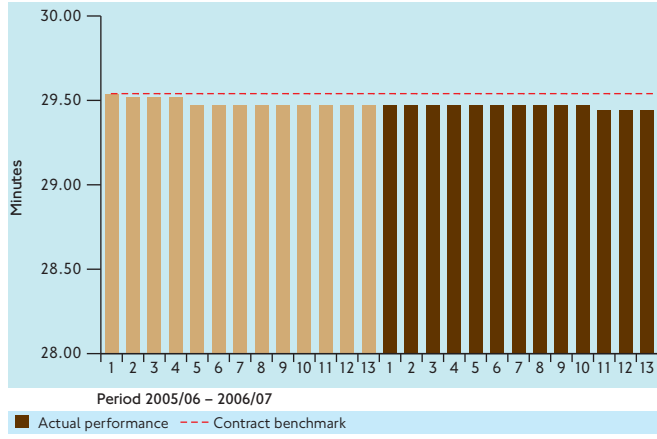
## Capability

Metronet BCV – capability  
Aggregate capability 2006/07

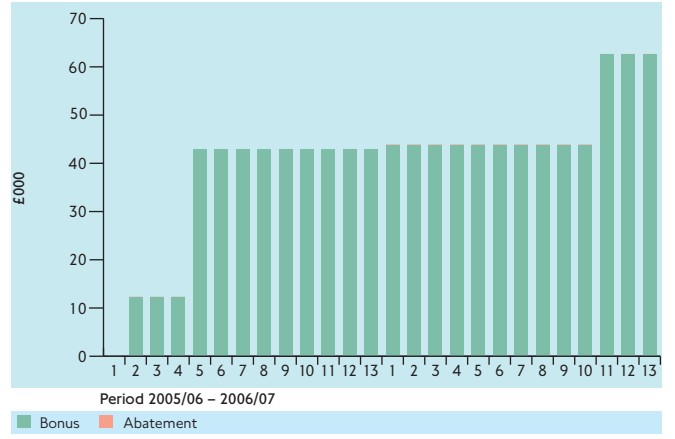




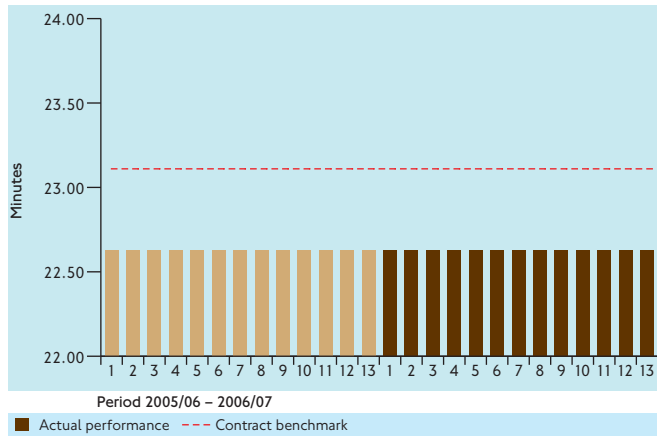
Southern SSL line capability  
Minutes



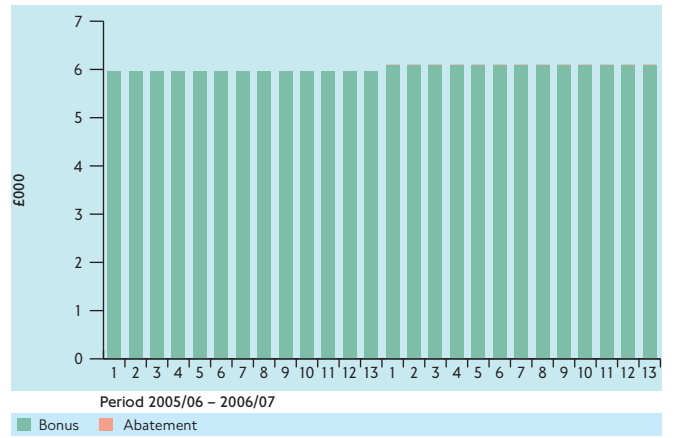
Southern SSL line capability  
Bonus / (Abatement) £000



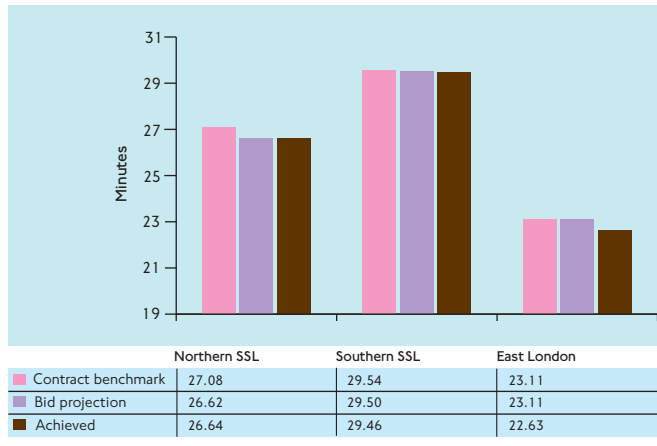
East London line capability  
Minutes



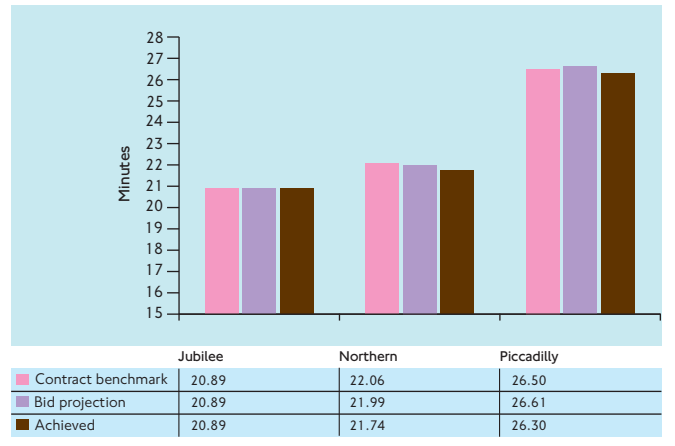
East London line capability  
Bonus / (Abatement) £000

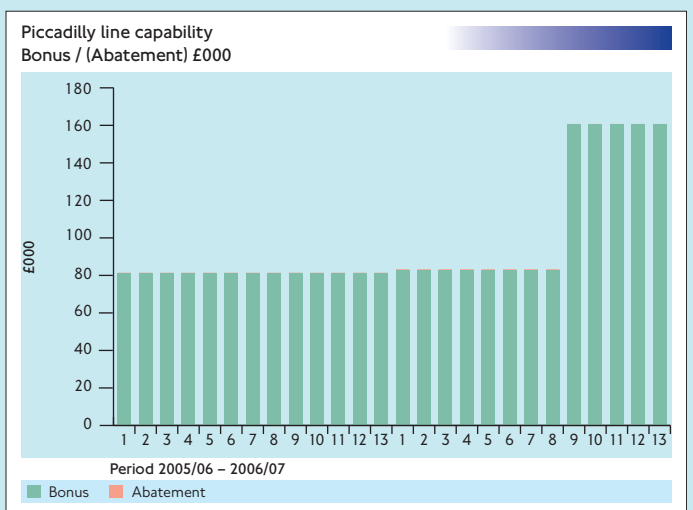
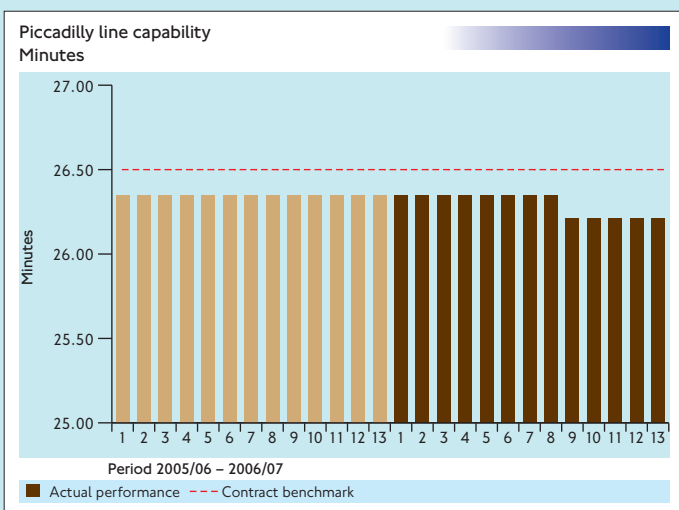
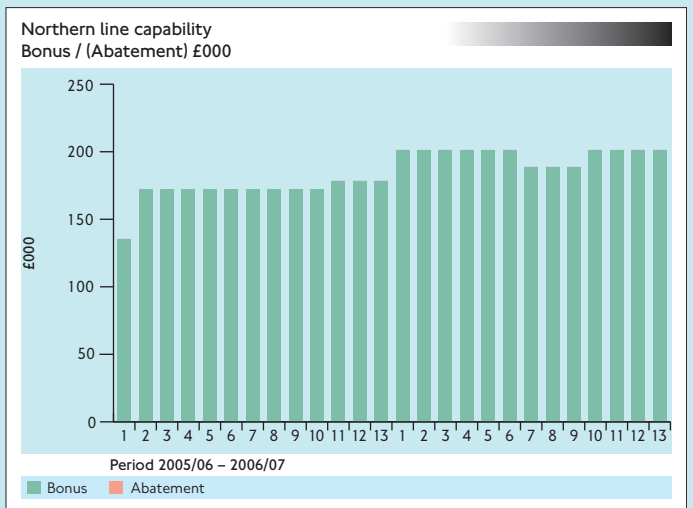
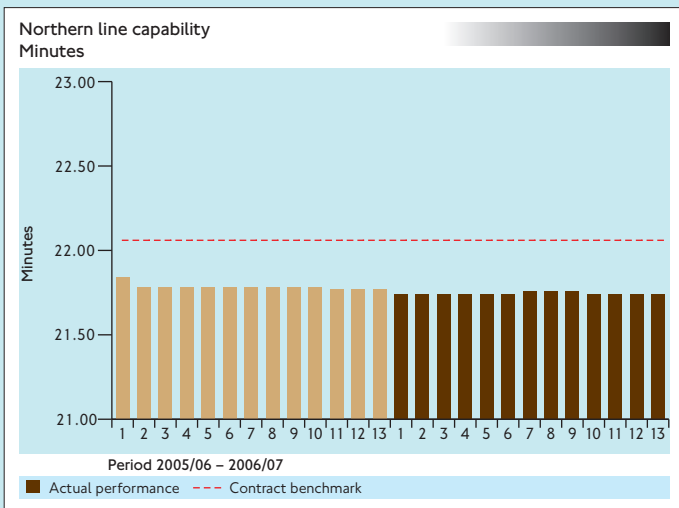
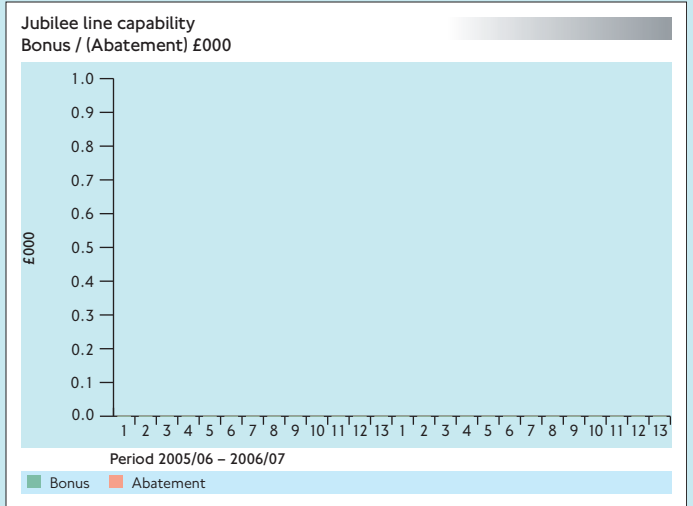
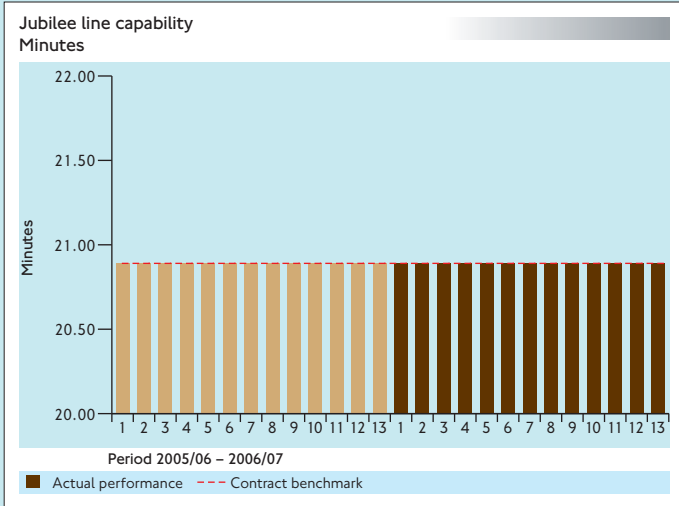


Metronet SSL – capability  
Aggregate capability 2006/07



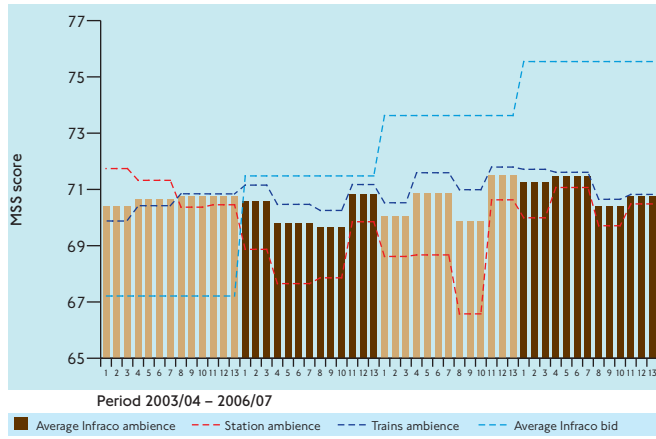
Tube Lines (JNP) – capability  
Aggregate capability 2006/07



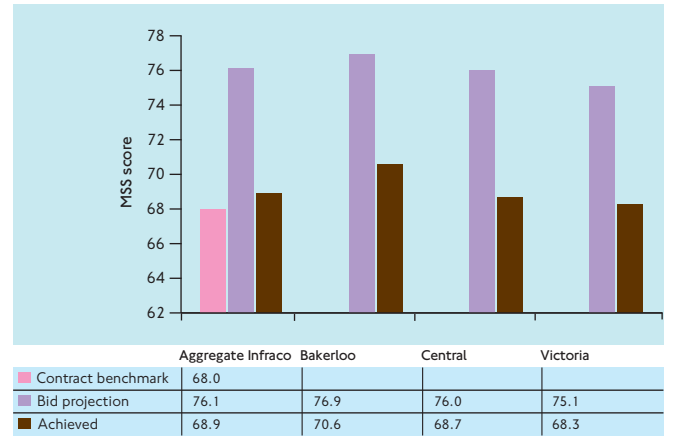


## Ambience

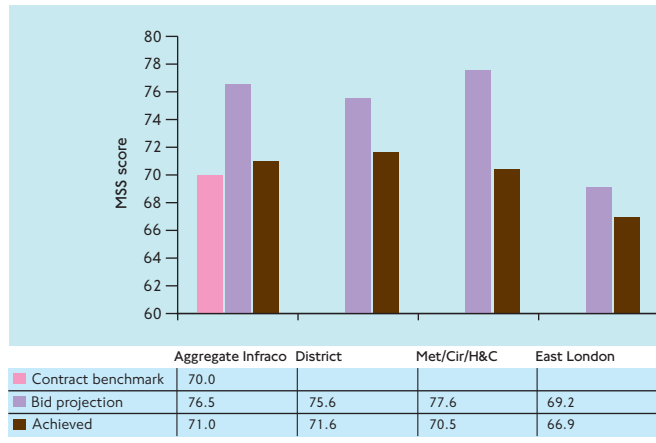
Average Infraco ambience performance



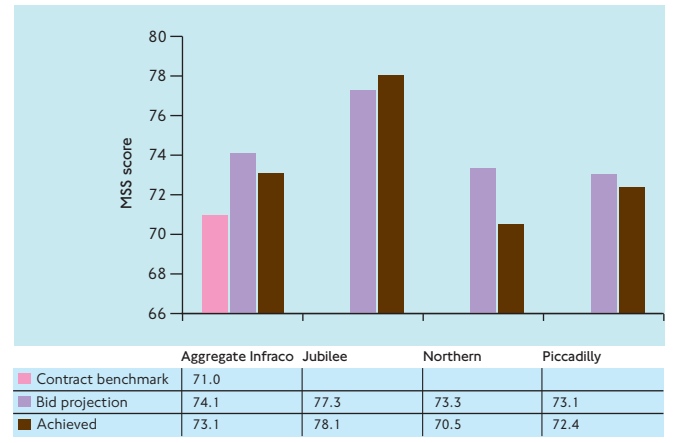
Metronet BCV – ambience  
Average MSS Score 2006/07



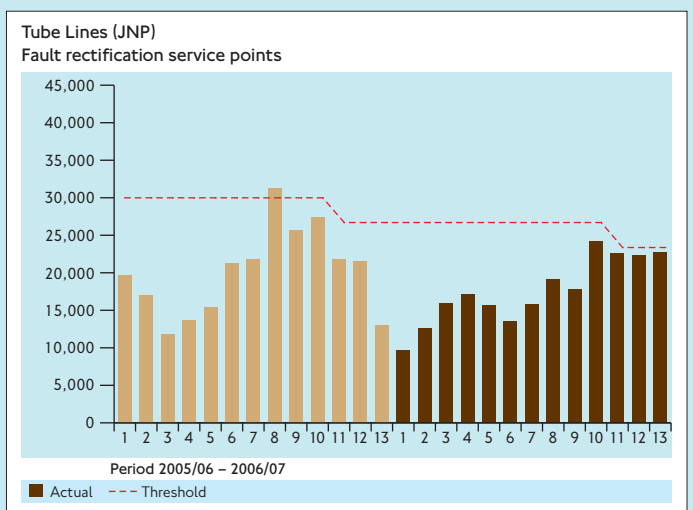
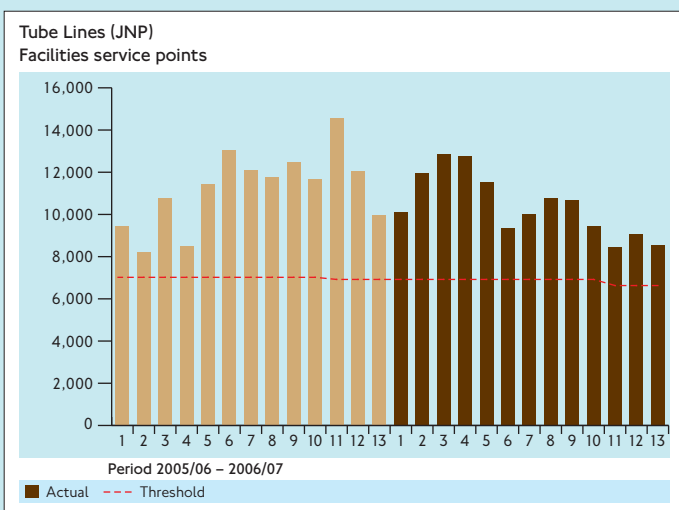
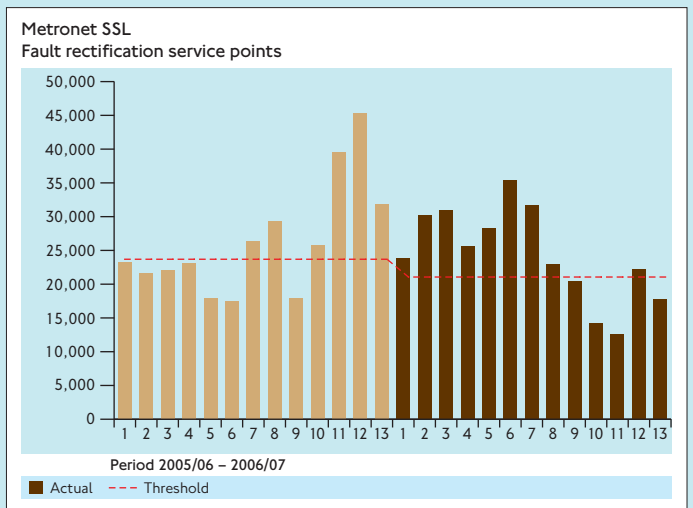
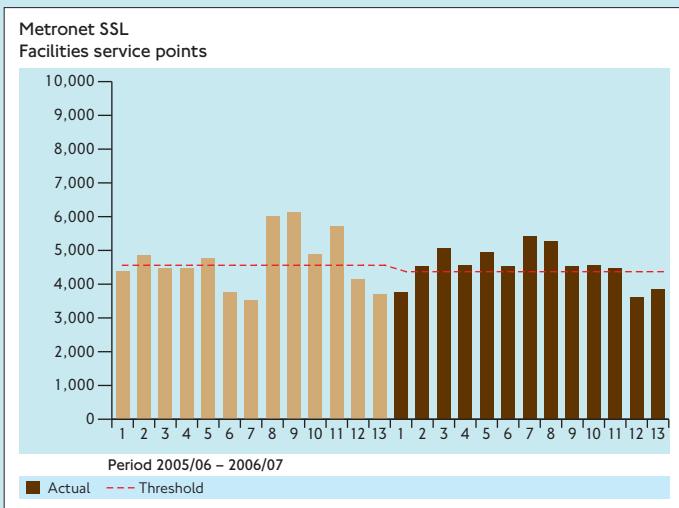
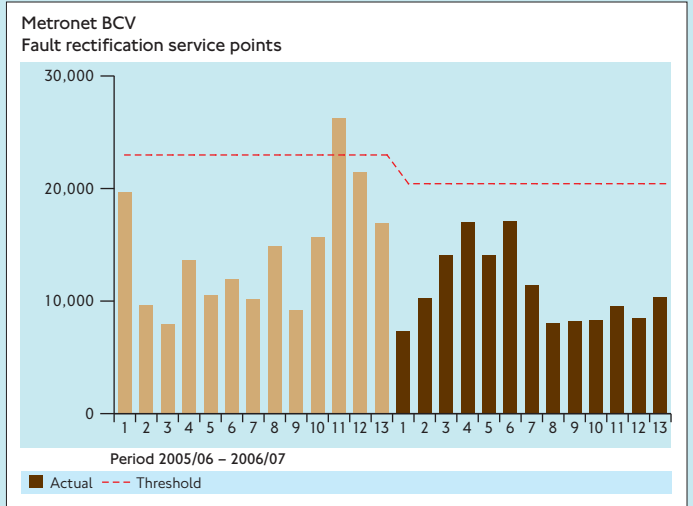
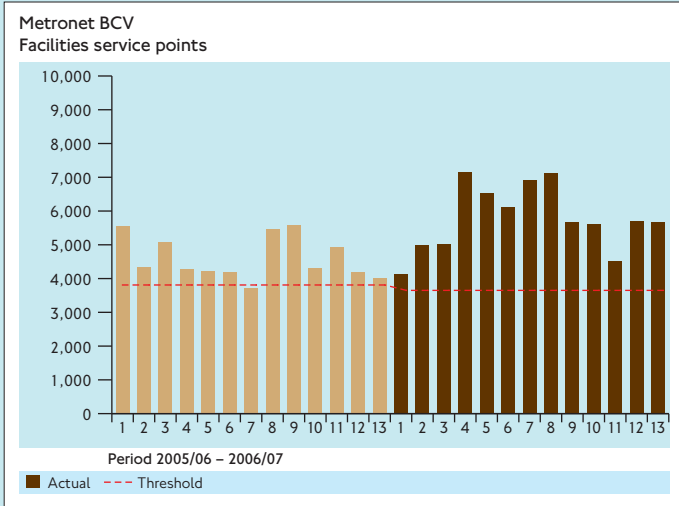
Metronet SSL – ambience  
Average MSS score 2006/07



Tube Lines (JNP) – ambience  
Average MSS score 2006/07

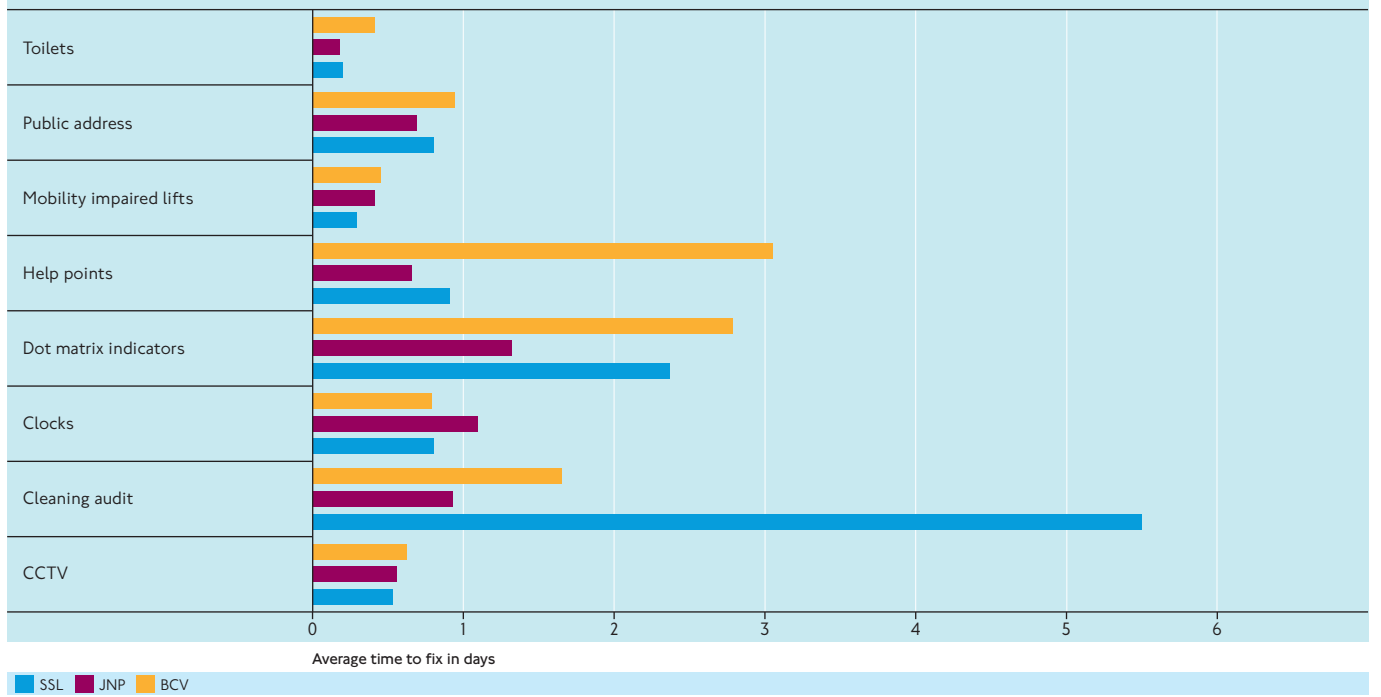


## Service Points



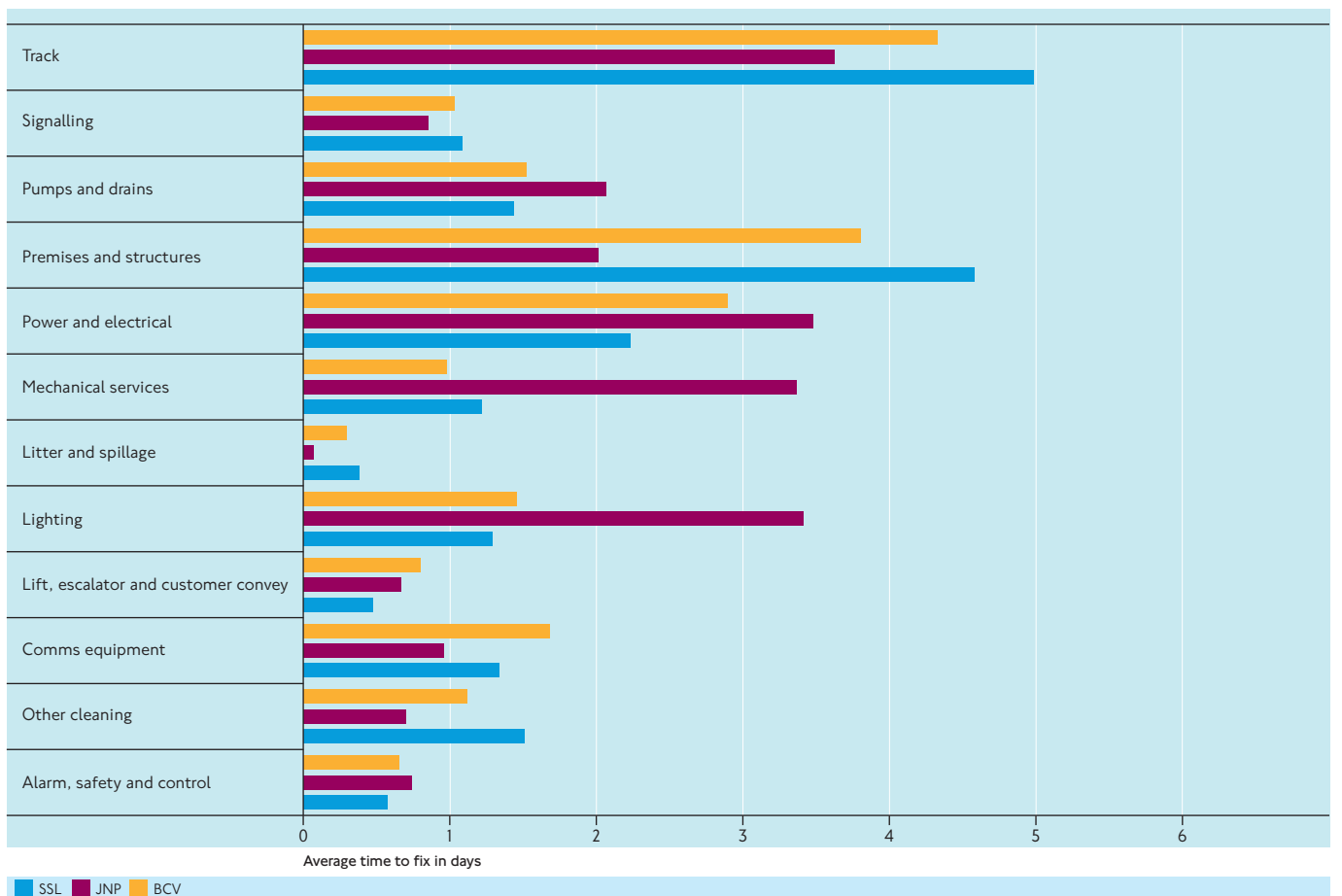
Facilities

Average fix time during 2006/07



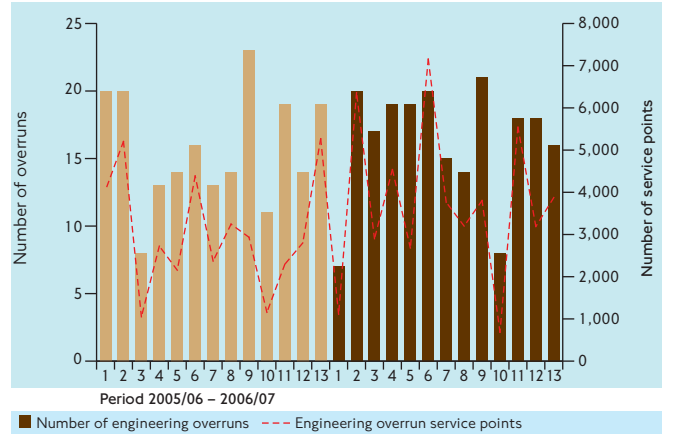
Fault rectification

Average fix time during 2006/07

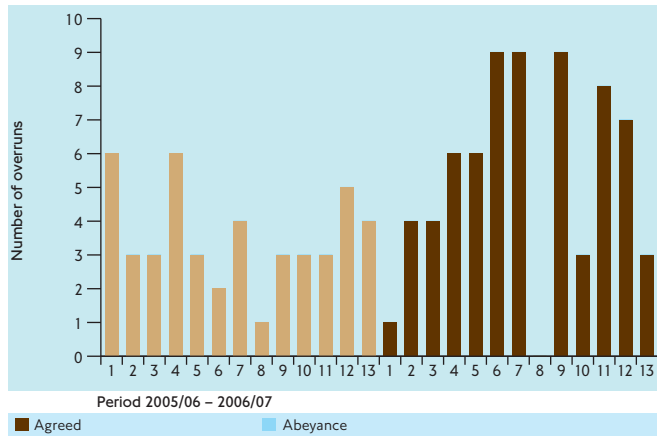


# Engineering Overruns

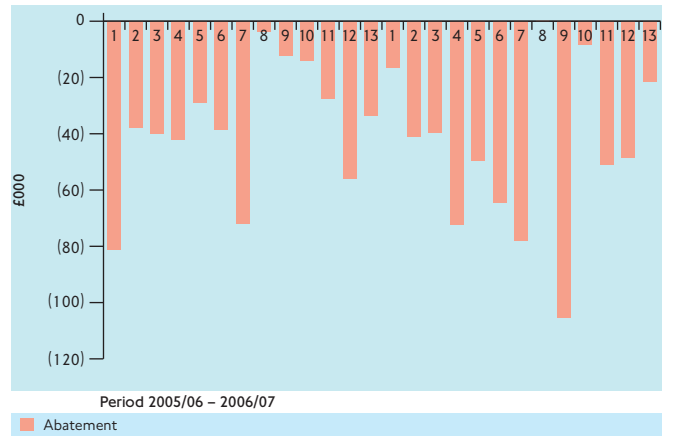
Engineering overruns – all Infracos



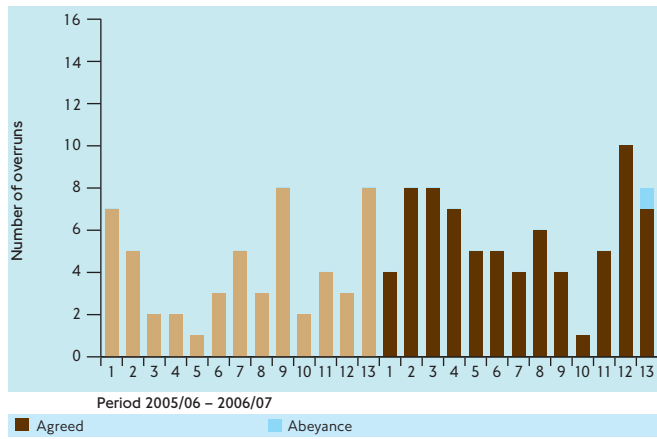
Metronet BCV  
Number of engineering overruns



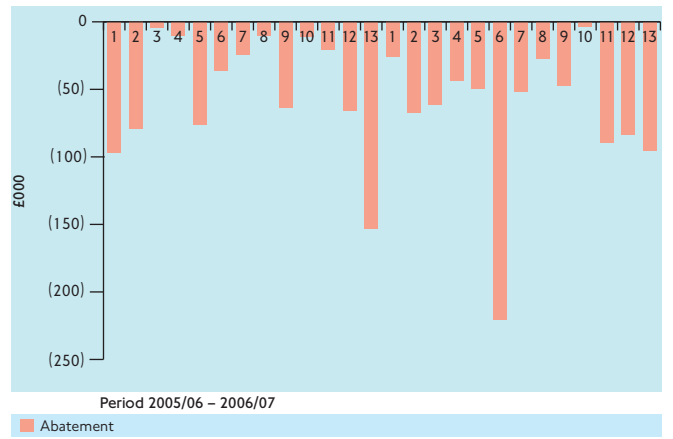
Metronet BCV engineering overruns  
ISC abatements by period



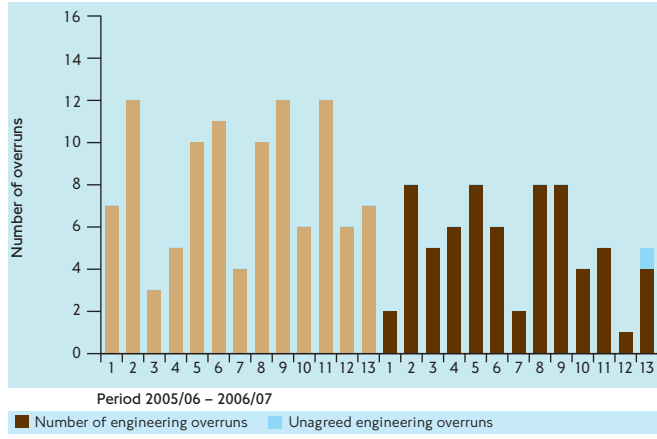
Metronet SSL  
Number of engineering overruns



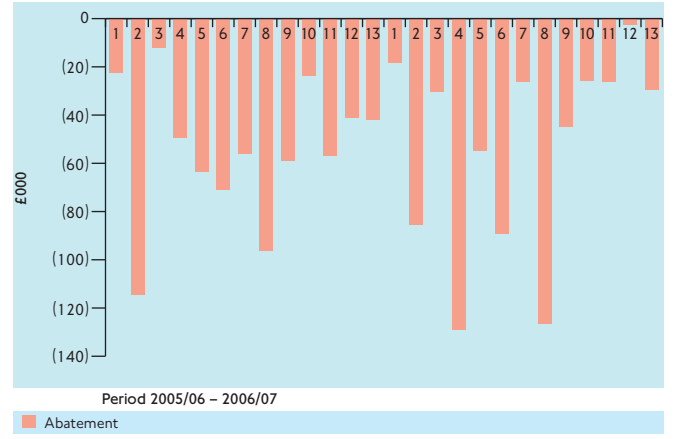
Metronet SSL engineering overruns  
ISC abatements by period



Tube Lines (JNP)  
Number of engineering overruns



Tube Lines (JNP) engineering overruns  
ISC abatements by period

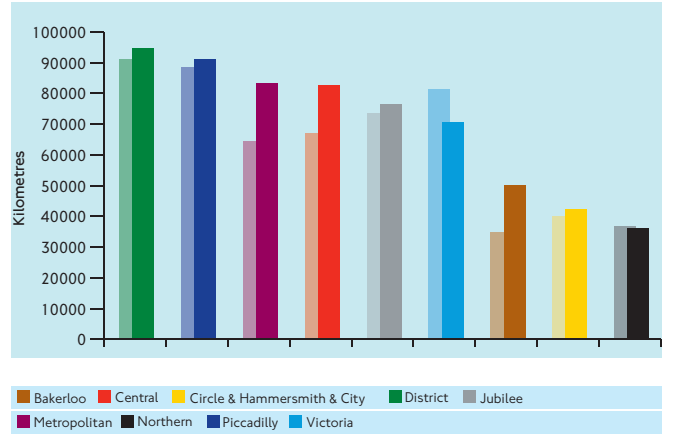


# 3.0 Maintenance and asset performance

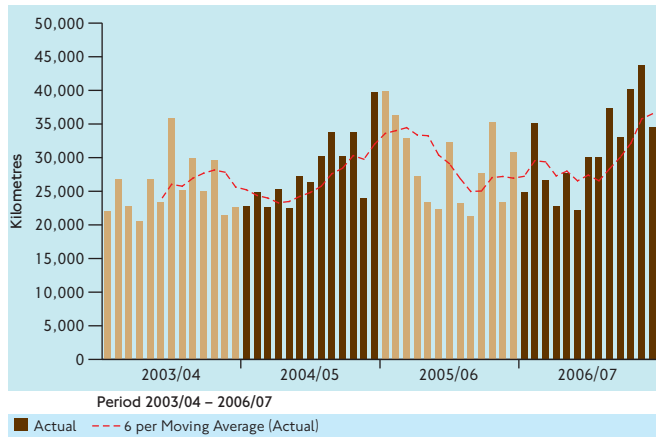


## Rolling Stock

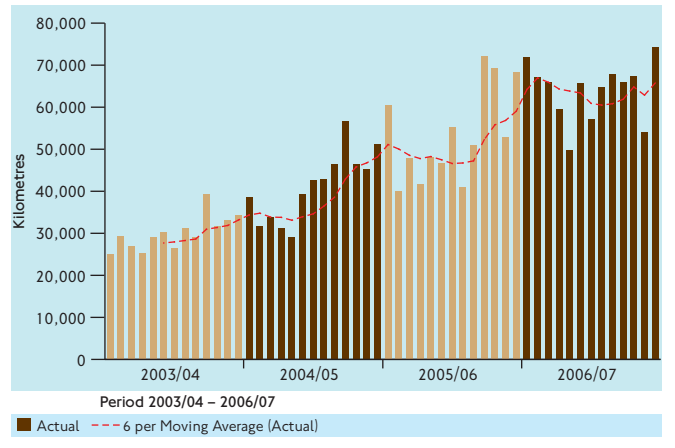
Rolling stock MDBF – average 2006/07 (2005/06 as shaded)  
(based on Infracore Cause Codes)



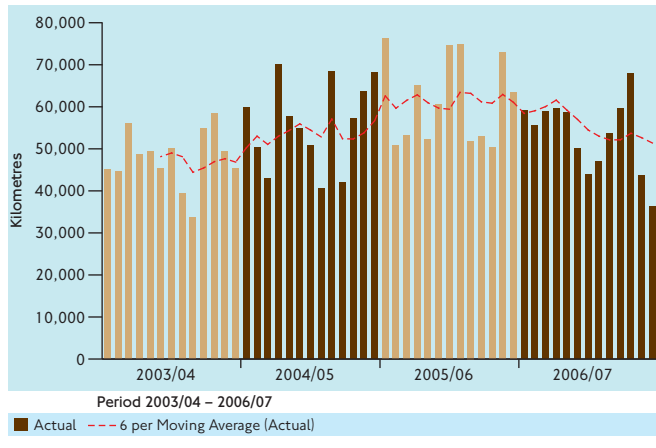
Bakerloo line – rolling stock  
Mean distance between failures (in service) based on LU Cause Codes



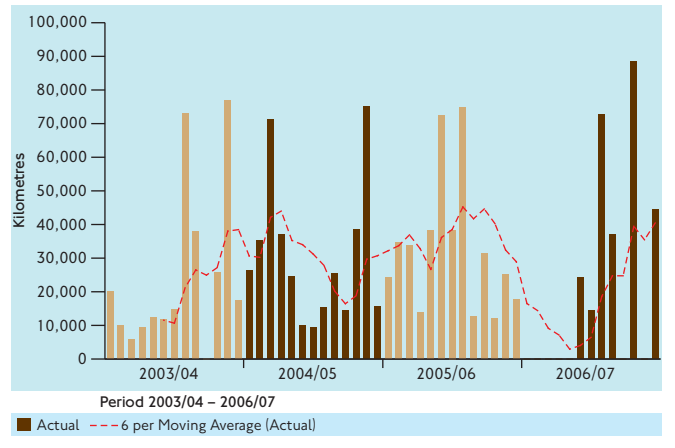
Central line – rolling stock  
Mean distance between failures (in service) based on LU Cause Codes



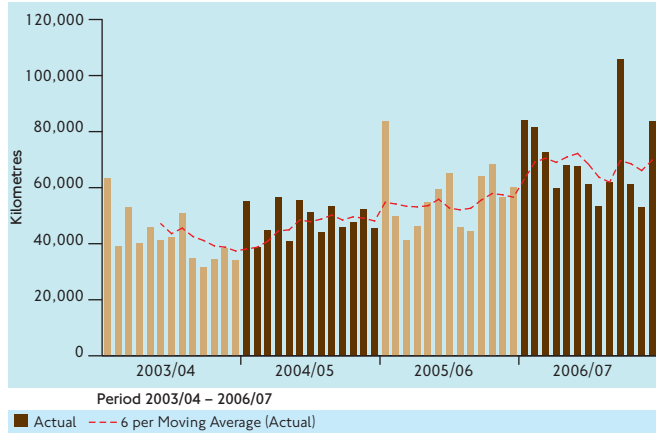
Victoria line – rolling stock  
Mean distance between failures (in service) based on LU Cause Codes



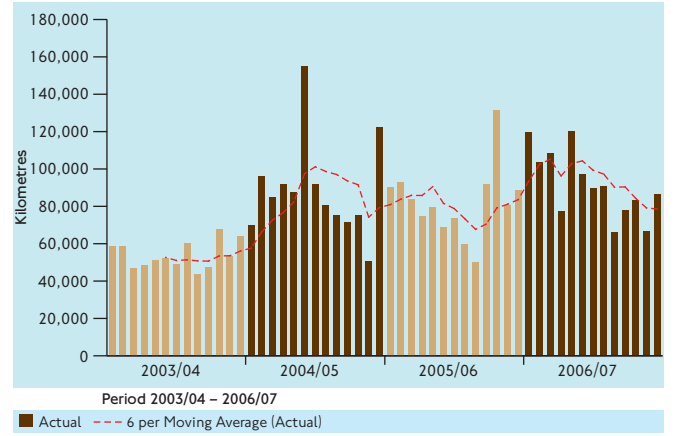
Waterloo & City line – rolling stock  
Mean distance between failures (in service) based on LU Cause Codes



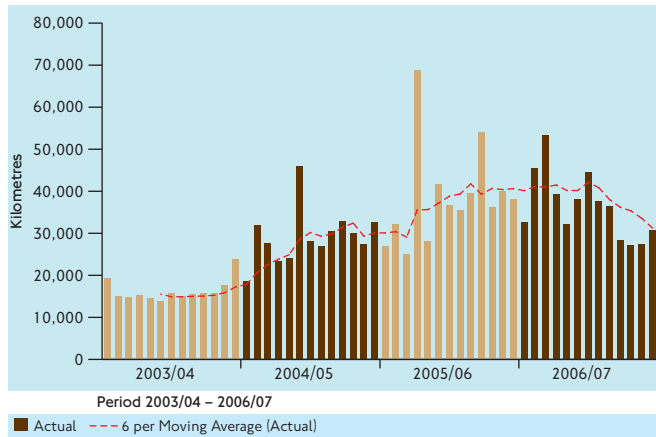
**Metropolitan line – rolling stock**  
Mean distance between failures (in service) based on LU Cause Codes



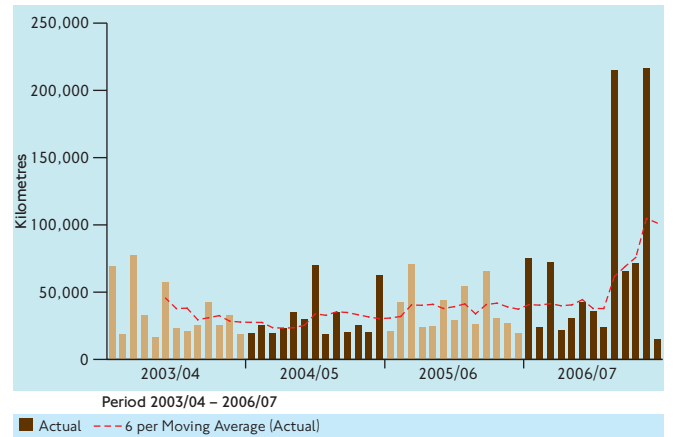
**District line – rolling stock**  
Mean distance between failures (in service) based on LU Cause Codes



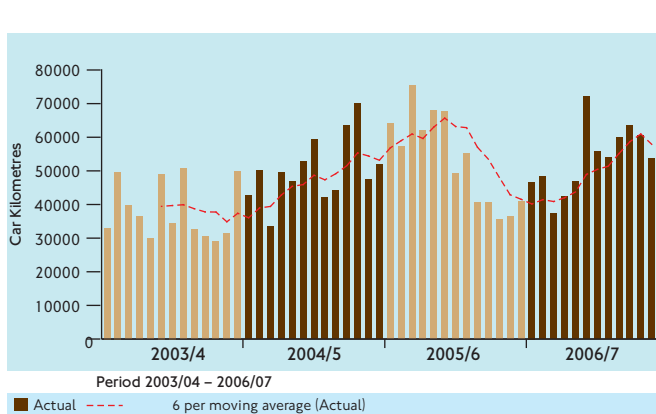
**Circle line – rolling stock**  
Mean distance between failures (in service) based on LU Cause Codes



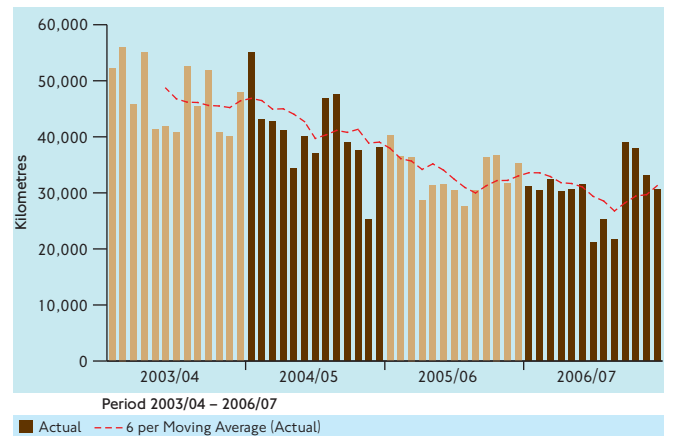
**East London line – rolling stock**  
Mean distance between failures (in service) based on LU Cause Codes



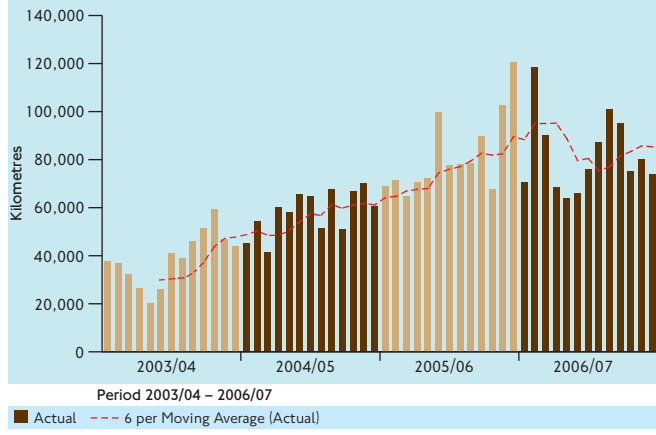
**Jubilee Line – rolling stock**  
Mean distance between failures (in service) based on LU Cause Codes  
7th Car from P11 2005/6



**Northern line – rolling stock**  
Mean distance between failures (in service) based on LU Cause Codes

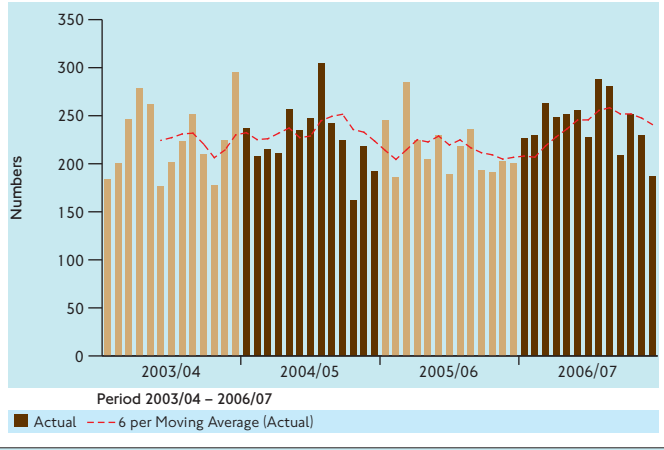


Piccadilly line – rolling stock  
Mean distance between failures (in service) based on LU Cause Codes

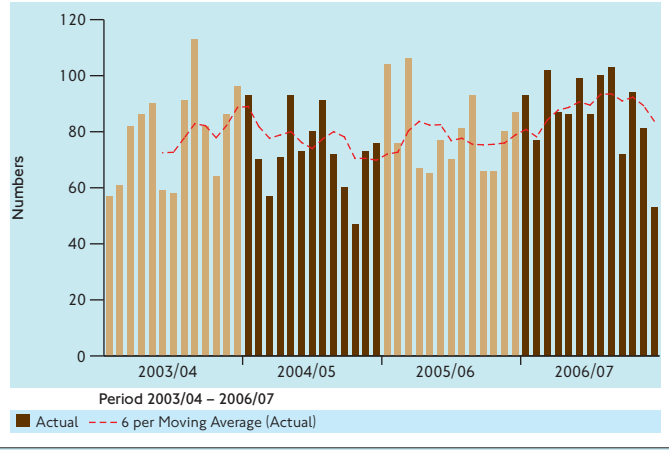


## Signalling and Control Systems

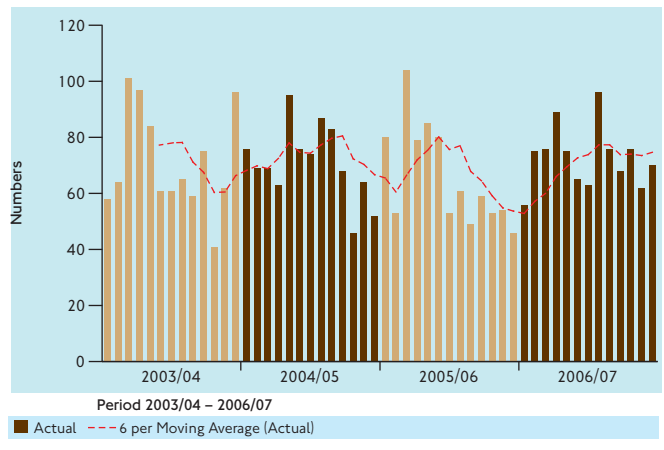
**All Infracos – train control**  
Number of in service failures resulting in service disruption > 2 minutes  
(based on LU Cause Codes)



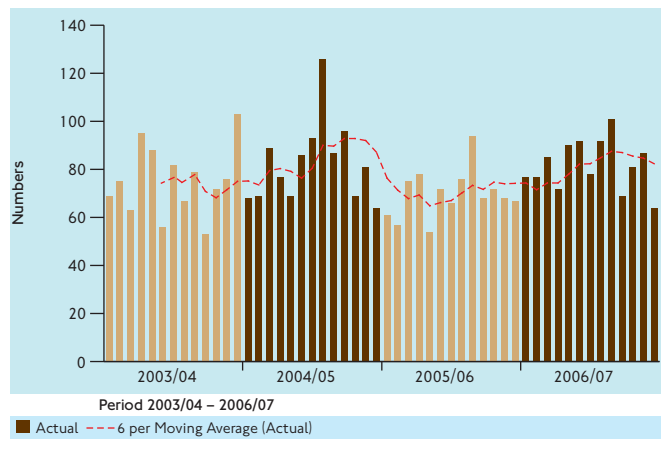
**Metronet SSL – train control**  
Number of in service failures resulting in service disruption > 2 minutes  
(based on LU Cause Codes)



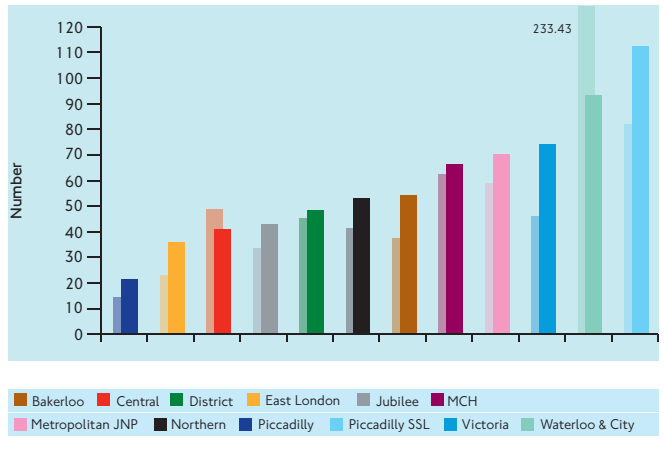
**Metronet BCV – train control**  
Number of in service failures resulting in service disruption > 2 minutes  
(based on LU Cause Codes)



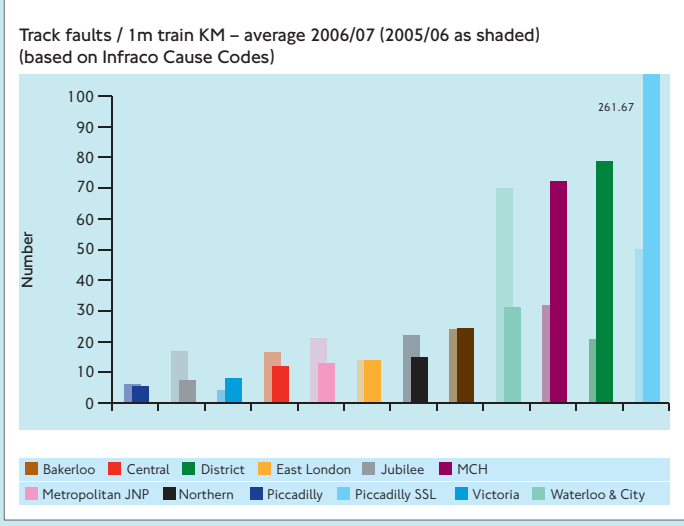
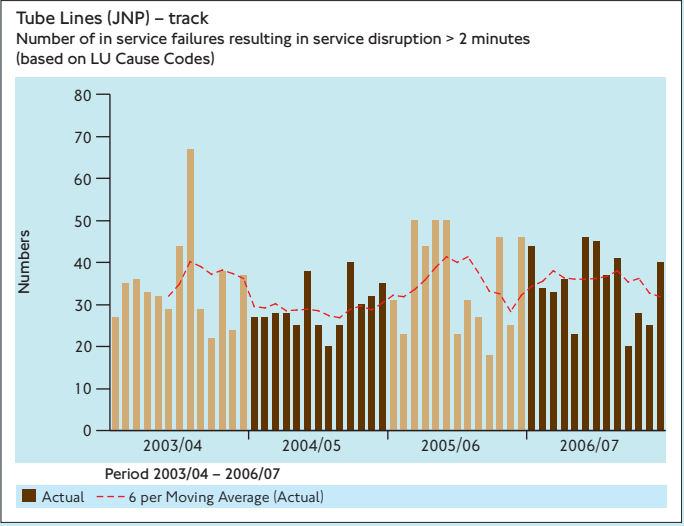
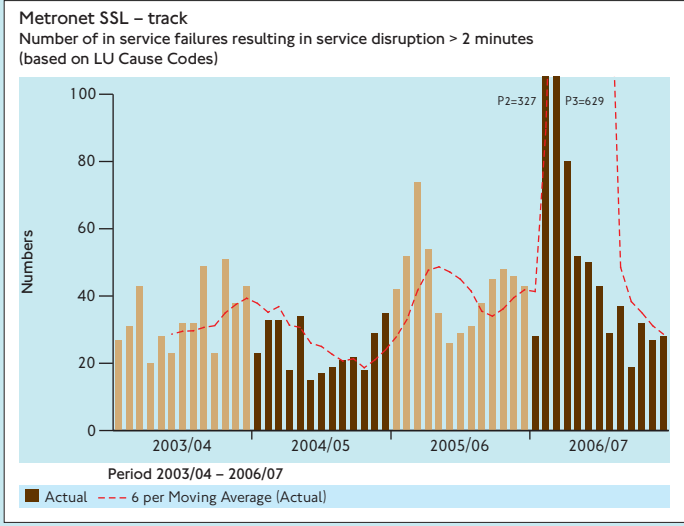
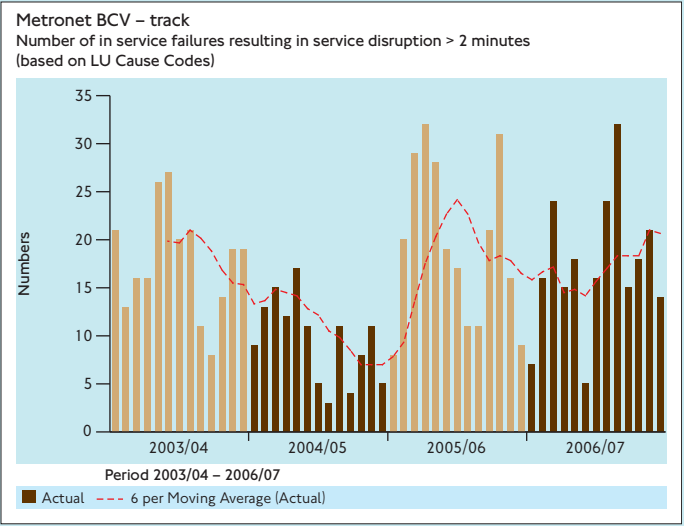
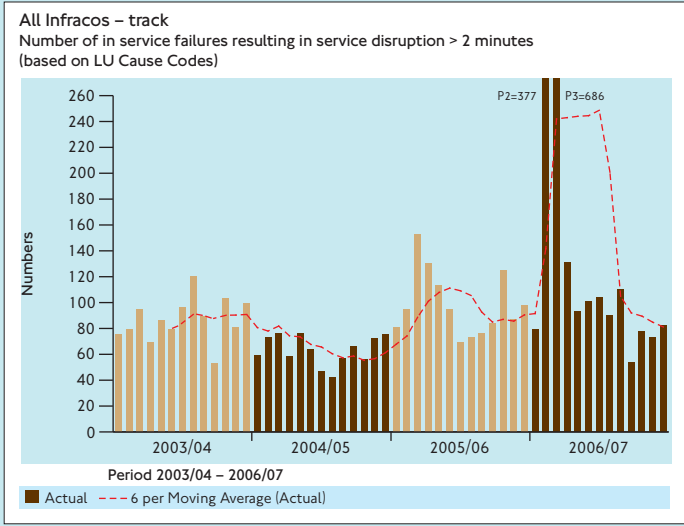
**Tube Lines (JNP) – train control**  
Number of in service failures resulting in service disruption > 2 minutes  
(based on LU Cause Codes)



**Train control faults / 1m train KM – average 2006/07 (2005/06 as shaded)**  
(based on Infraco Cause Codes)

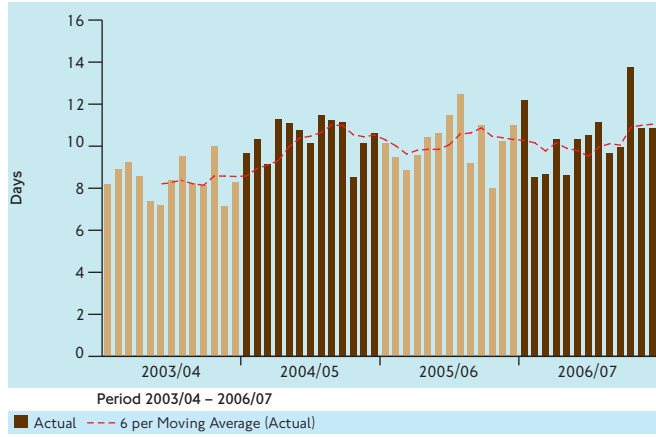


# Track

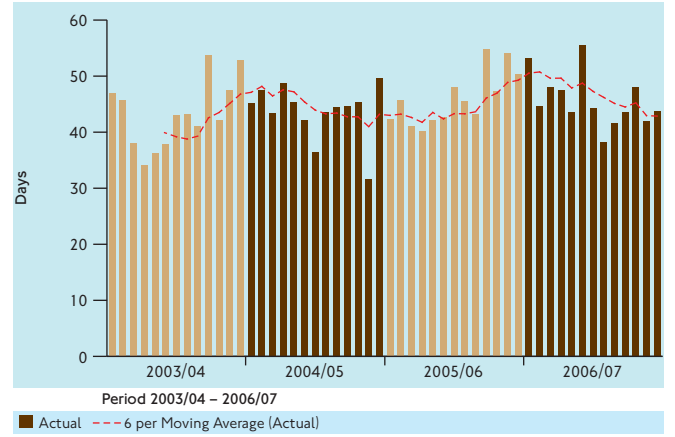


## Escalators and Lift

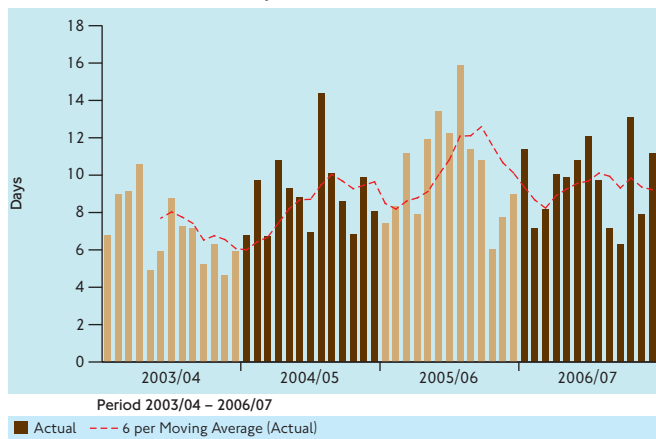
**Total all Infracos – lifts**  
Mean time between failures (days) based on LU Cause Codes



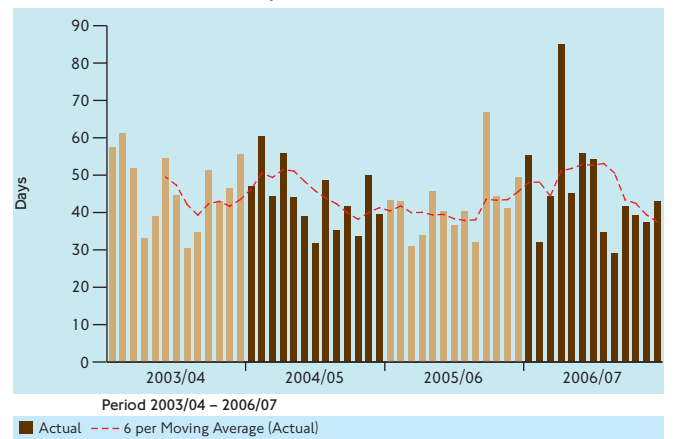
**Total all Infracos – escalators**  
Mean time between failures (days) based on LU Cause Codes



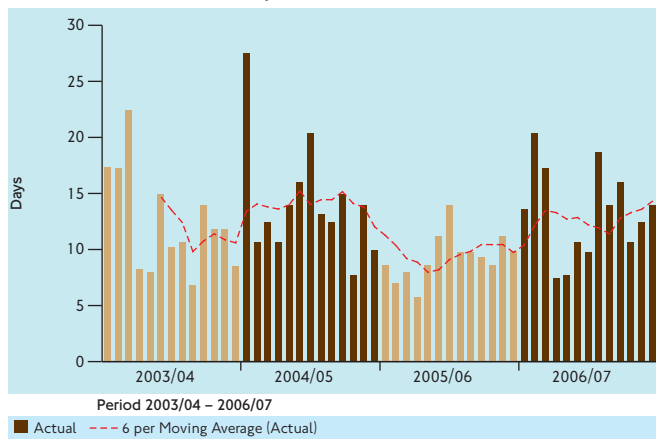
**Metronet BCV – lifts**  
Mean time between failures (days) based on LU Cause Codes



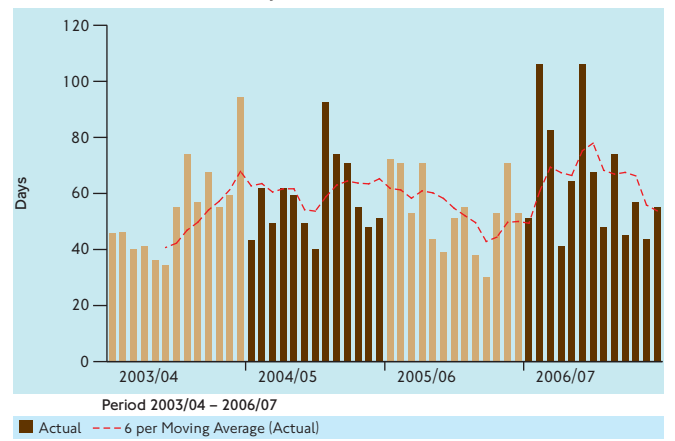
**Metronet BCV – escalators**  
Mean time between failures (days) based on LU Cause Codes



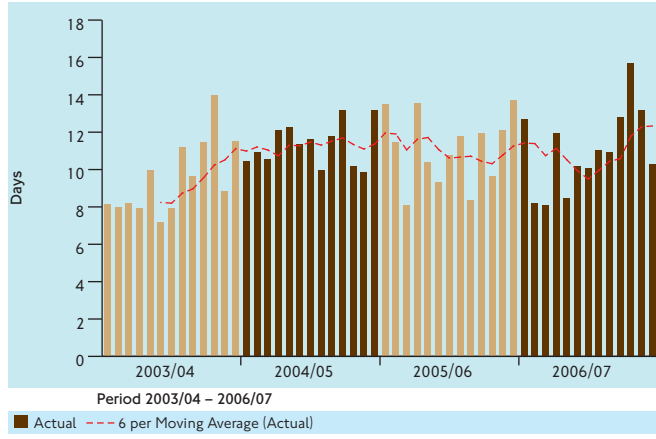
**Metronet SSL – lifts**  
Mean time between failures (days) based on LU Cause Codes



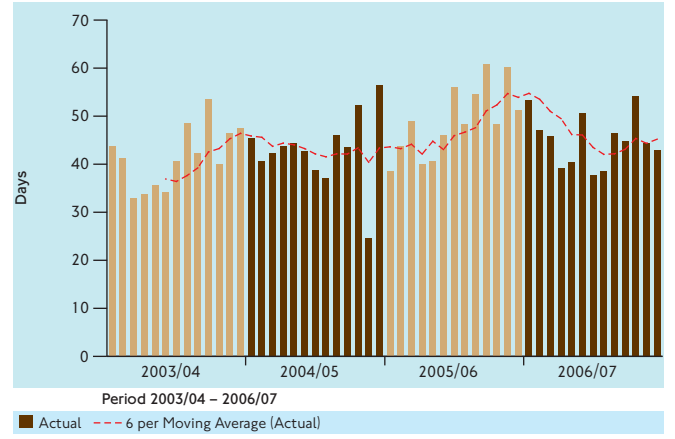
**Metronet SSL – escalators**  
Mean time between failures (days) based on LU Cause Codes



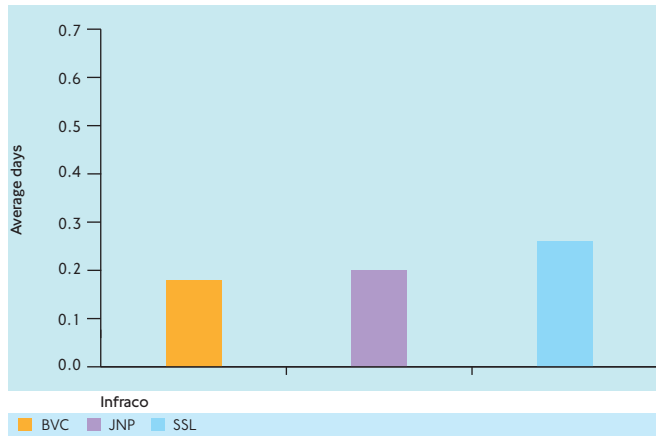
Tube Lines (JNP) – lifts  
Mean time between failures (days) based on LU Cause Codes



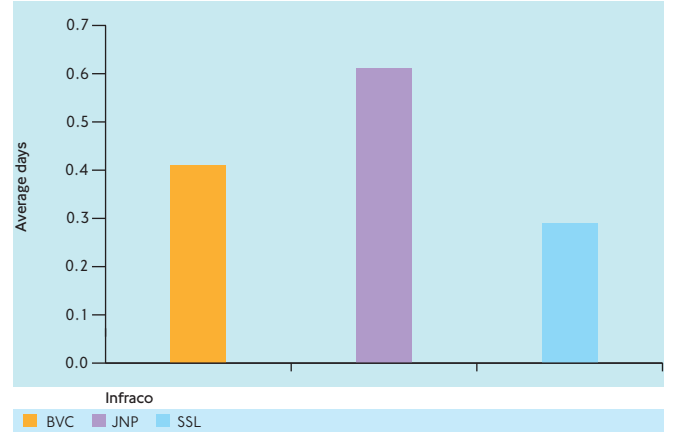
Tube Lines (JNP) – escalators  
Mean time between failures (days) based on LU Cause Codes



Lift failures  
Average fix time during 2006/07



Escalator failures  
Average fix time during 2006/07

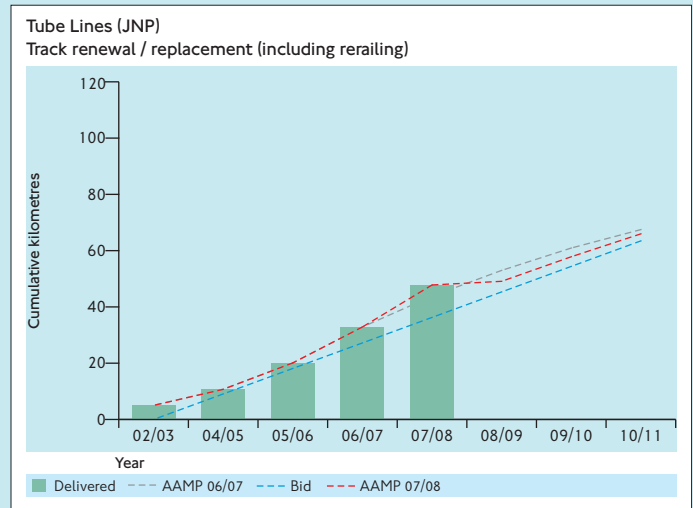
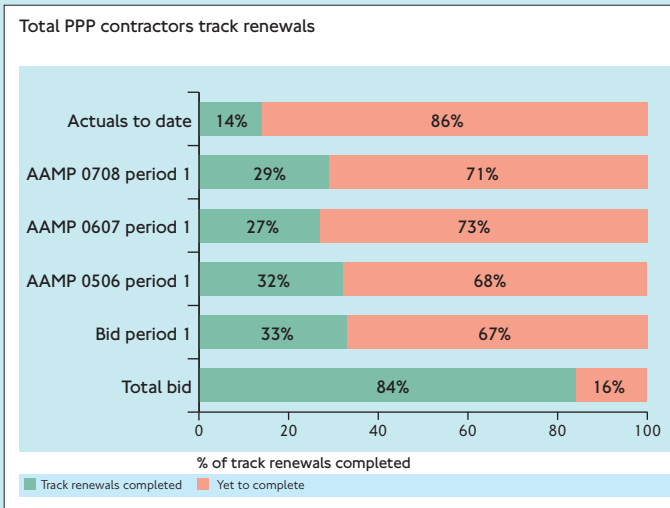
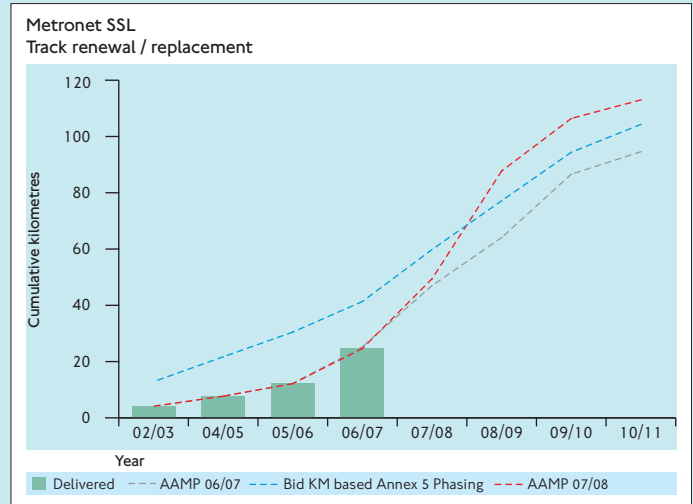
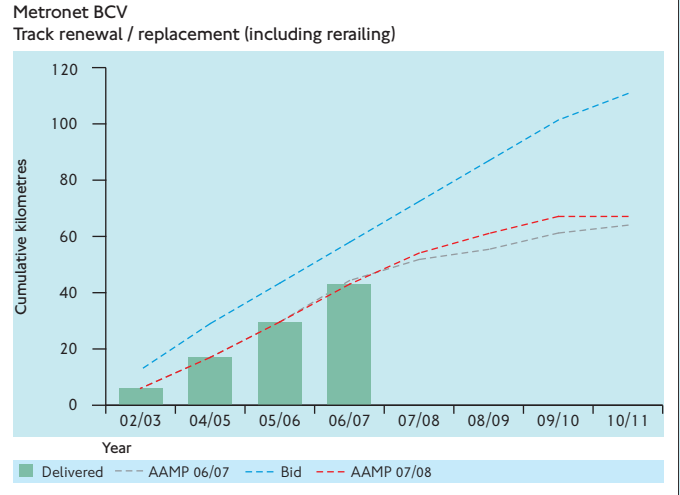


# 4.0 Renewals and upgrades



## Track

Track renewal Kilometres	Cumulative first 4 years	Plan for next 3 1/2 years	Hence total expected Period 1	Bid total to end of Period 1	Expected as % of bid
Metronet BCV	43.0	24.2	67.1	108.6	62%
MetronetSSL	24.7	88.3	113.0	104.3	108%
Tube Lines	47.8	18.2	66.0	68.0	97%
<b>Total kms</b>	<b>115.5</b>	<b>130.7</b>	<b>246.1</b>	<b>280.9</b>	<b>-</b>
<b>As % network</b>	<b>14%</b>	<b>-</b>	<b>29%</b>	<b>33%</b>	<b>-</b>

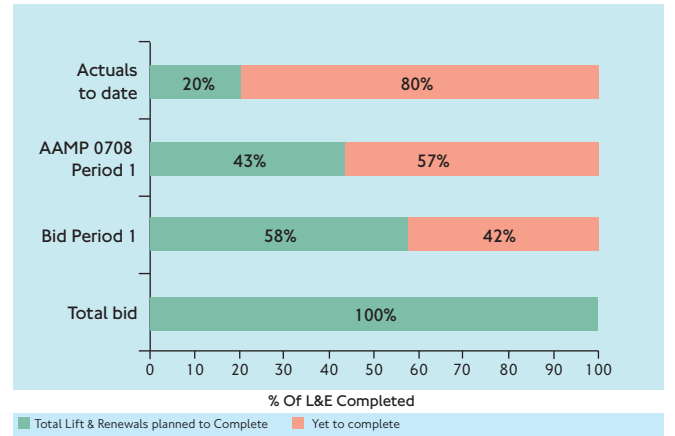


## Lifts and Escalators

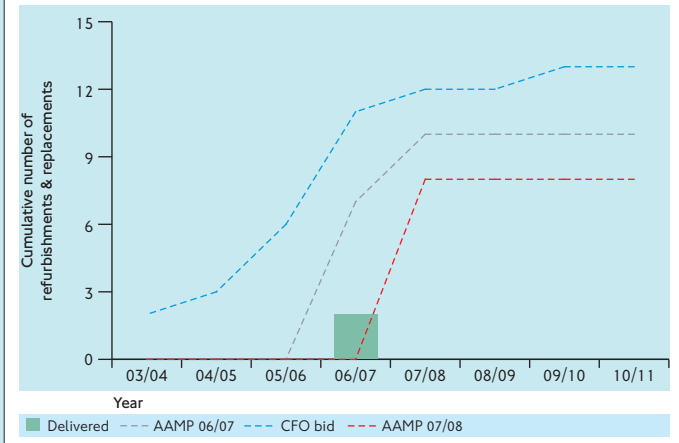
	Cumulative first 4 years	Plan for year 3 1/2 years	Hence total expected	Bid total to end of Period 1	Expected as % of bid
<b>Lifts <sup>(1)</sup></b>					
Metronet BCV	8	9	17	34	50%
Metronet SSL	4	15	19	20	95%
Tube Lines	2	32	34	66	52%
<b>Total</b>	<b>14</b>	<b>56</b>	<b>70</b>	<b>120</b>	-
<b>Escalators</b>					
Metronet BCV	29	31	60	58	103%
Metronet SSL	17	10	27	22	123%
Tube Lines	43	44	87	103	84%
<b>Total</b>	<b>89</b>	<b>85</b>	<b>174</b>	<b>183</b>	-

<sup>(1)</sup> Includes Passenger Service and Step Free Access Lifts

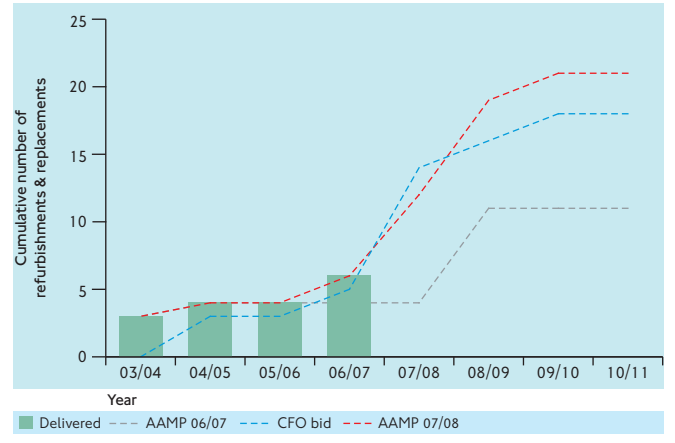
### Total Lift & Escalator Refurbishments & Replacements



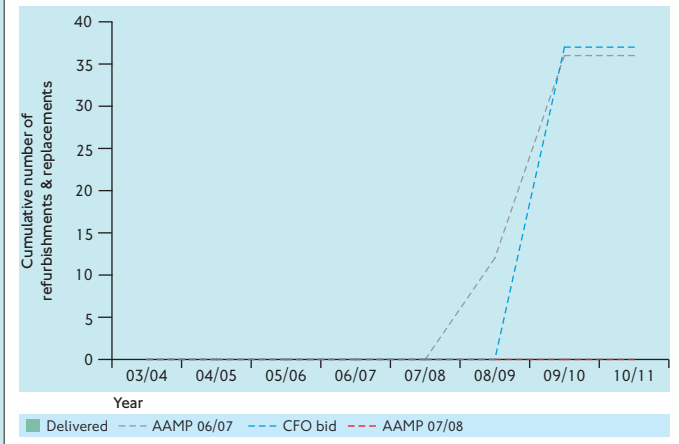
### Metronet BCV Step free access lift refurbishment & replacement



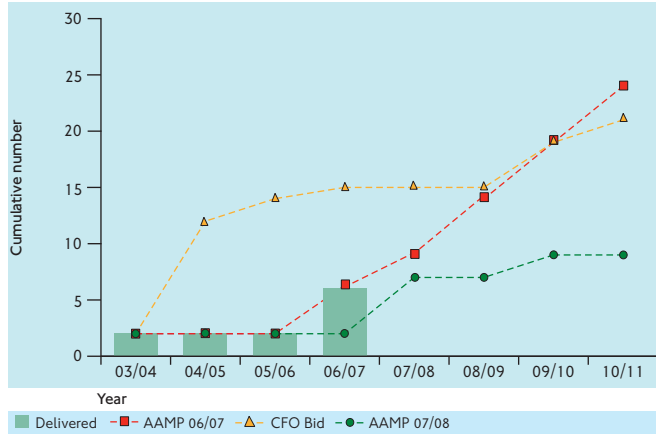
### Metronet SSL Step free access lift refurbishment & replacement



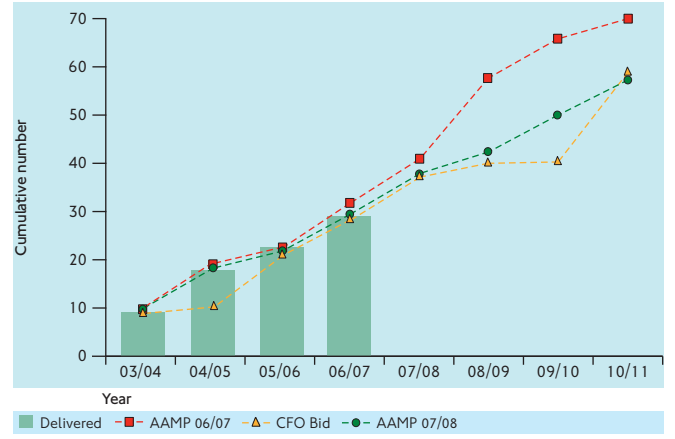
### Tube Lines (JNP) Step free access lift refurbishment & replacement



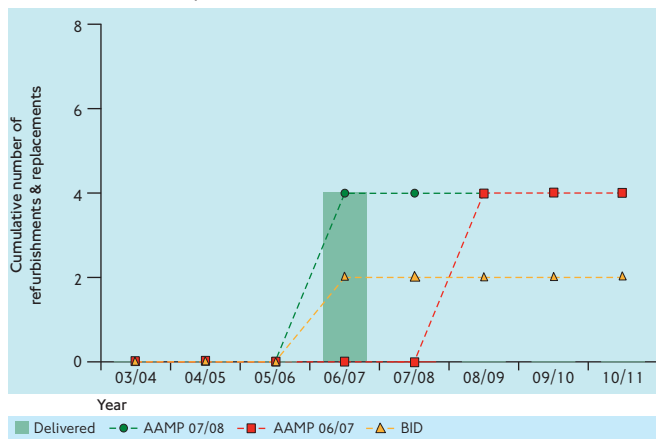
**Metronet BCV**  
Lift refurbishment & replacement



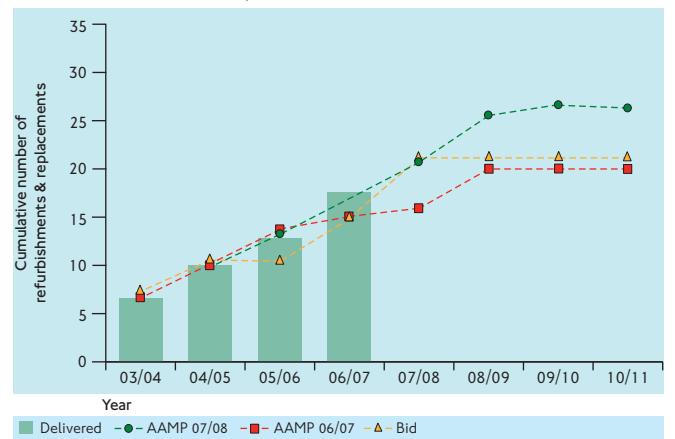
**Metronet BCV**  
Escalator refurbishment & replacement



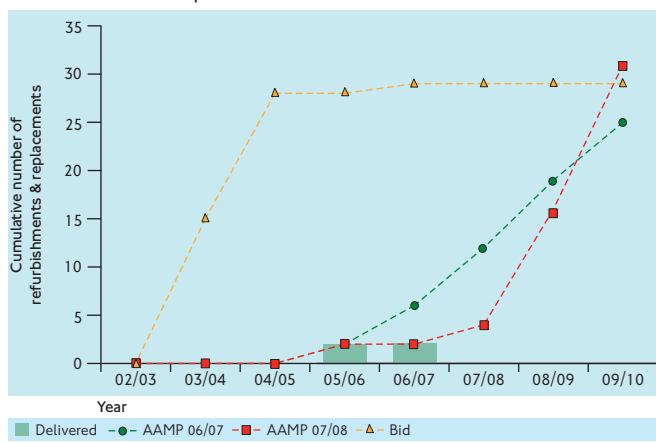
**Metronet SSL**  
Lift refurbishment & replacement



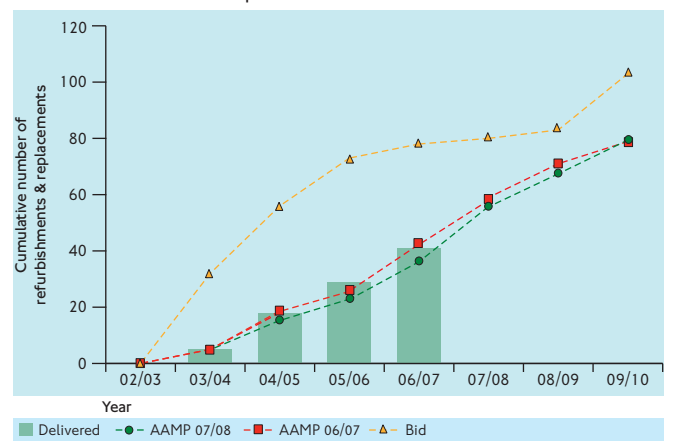
**Metronet SSL**  
Escalator refurbishment & replacement



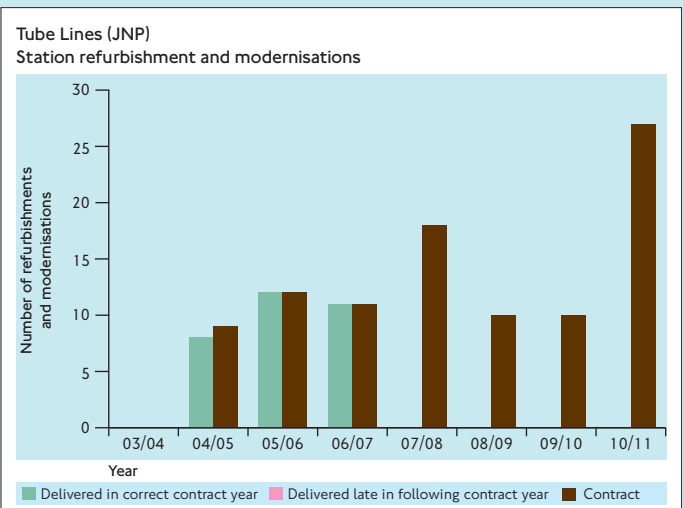
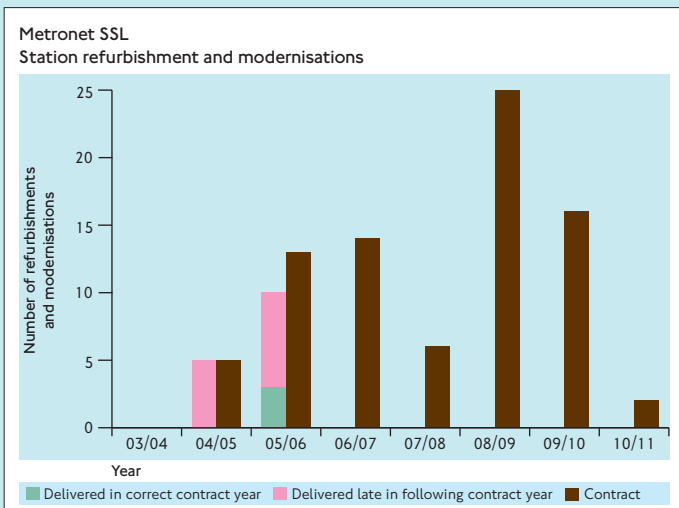
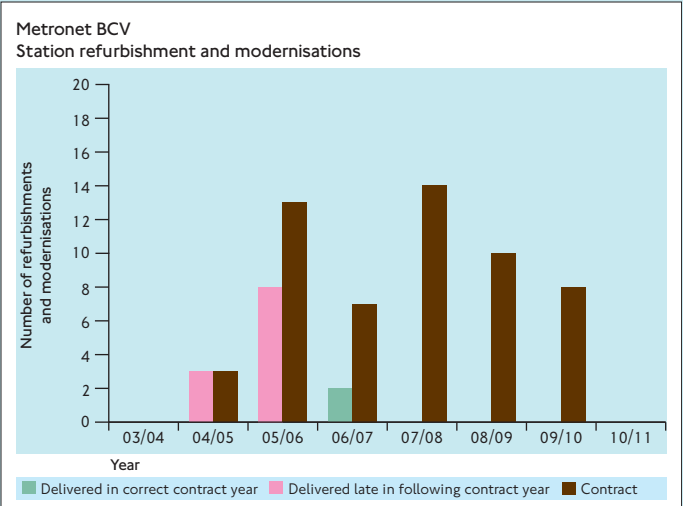
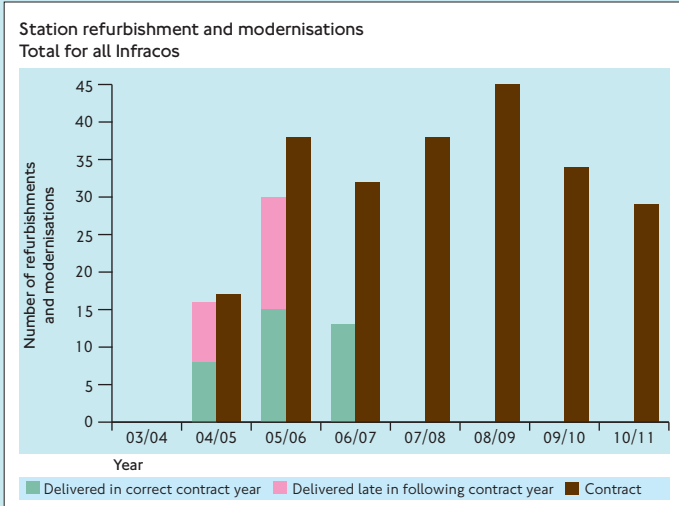
**Tube Lines (JNP)**  
Lift refurbishment & replacement



**Tube Lines (JNP)**  
Escalator refurbishment & replacement



## Station Enhancement Programme



Line	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Contract delivery date	Increase in peak capacity
Central	█	█	█															2006	5%
Waterloo & City	█	█	█	█														2007	25%
Jubilee	█	█	█	█	█	█												2009	33%
Northern	█	█	█	█	█	█	█	█	█									2012	20%
Victoria	█	█	█	█	█	█	█	█	█	█								2013	19%
Piccadilly				█	█	█	█	█	█	█	█							2014	25%
Sub-surface	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	2012-18	48%
Bakerloo							█	█	█	█	█	█	█	█	█	█	█	2020	38%



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