



Tube Lines - Then and Now

Steve McDonagh, April 20 2018

P3 Structure – Three Infrastructure Cos



- 30 year contracts divided into 4 x 7 ½ year review periods
- London Underground Limited (LUL) opportunity to restate its need
- Infraco submit 'bid' with price for remainder of contract
- If can't agree price – P3 Arbiter will set price
- Of the three Infracos, 2 were for deep tube lines
 - BCV (Bakerloo, Central, Victoria)
 - JNP (Jubilee, Northern, Piccadilly)
- \$17.0 billion to be spent by the Infracos in the first 7 ½ years
- More than \$6 million per day

Infraco's Role



- Provide
- Maintain
- Renew
- Upgrade
- Not own
- Not operate

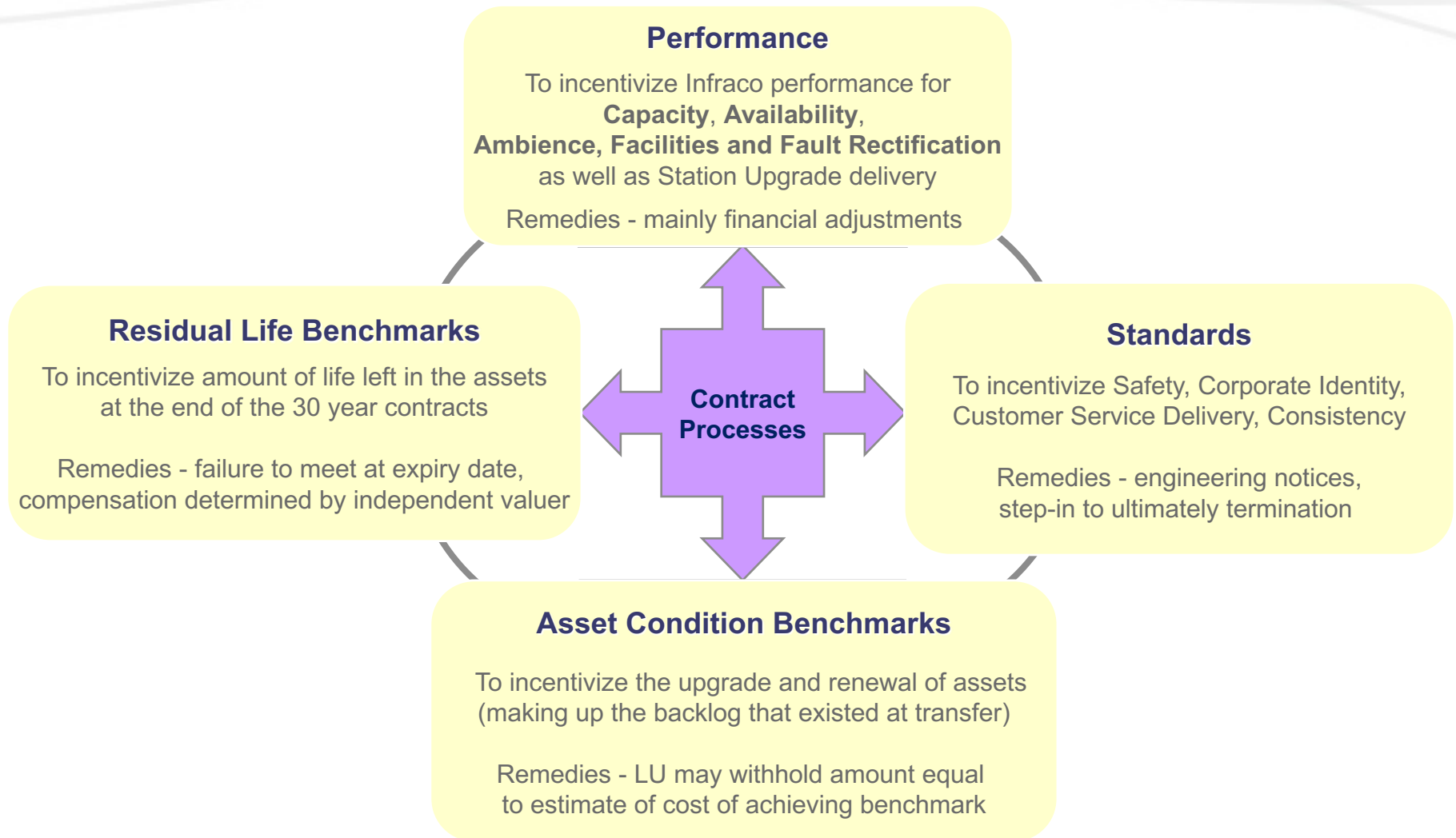


All assets/services

Output based contracts that set out to achieve

- Upgrade of assets and increase in system capacity
- Improve asset performance and reliability
- No compromise to safety
- Focus on 'whole life asset management'
- Optimization of Capex vs. Opex spends
- Adequate and commercially sensible risk transfer
- Value for money - economic and efficient

P3 Incentive Contracts



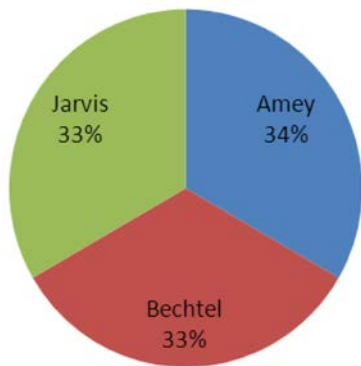
Who is Tube Lines?



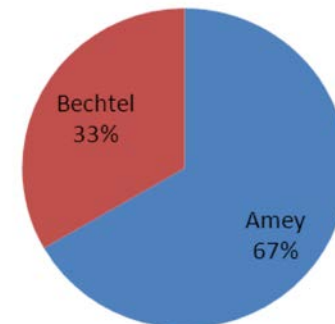
- Consortium set up between Amey, Bechtel and Jarvis
- Successfully won the contract for the Jubilee, Northern and Piccadilly Lines
- Contract start January 2003



Tube Lines



**Tube Lines
post 2006**



Responsible for Maintaining and Renewing Jubilee, Northern and Piccadilly Lines



- Over 500 million journeys per year are made on these lines
- Although there are six other lines, these three account for 41% of the London Underground's overall assets



Key Assets



255 passenger trains



241 miles of Track



Signals: 110,192



Bridges and Structures-4,314
Deep Tube Tunnels-127 miles
Earth Structures-51 miles
Track Drainage Pipes-74 miles



100 Stations
340 Non-Station Properties



110 Elevators
231 Escalators

Key Challenges



- Taking over a part of a Public Sector Organization
- Direct labor employed for most of the key services
- Strong union influence resisting change
- Poor information on which to base decisions
- Expensive to run and performing poorly compared to external benchmarks
- Lack of flexibility of working
- Lack of motivation
- Performance communication poor

Culture change required

Amey's Management Approach



- Twenty key personnel “seconded” from Amey to Tube Lines in critical leadership positions to lead the culture change
- Communications plan in place to inform all staff of our approach to the way forward in Tube Lines
 - Actual performance and targets clearly identified
- Change Management Program put in place
 - Diagnostic carried out for Asset Management maturity
 - Staff engagement at all levels
 - Processes made fit for purpose
 - New systems to be implemented to enable the new processes
- Competency improvement program implemented

What Did We Do - Rebrand



What Did We Do - Communications



Covering period 10 | 10 December – 6 January 2006

REGULAR TWO-WAY, FACE-TO-FACE COMMUNICATIONS FOR TUBE LINES

INSIDE

PERFORMANCE
NEWS

BUSINESS BRIEFS

YOUR FEEDBACK

FEEDBACK FORM

Welcome to the period 10 Interchange

This issue covers performance news from period 10 and up-to-date business news. Use it to brief your team and let us know what you think at interchange@tubelines.com.

IN A NUTSHELL

Could this be the best performance we've ever seen? The Northern had its best period ever, and the Jubilee and Picadilly both beat target too. The Safety lost time injury frequency rate went down again, Ambience beat target and Fault Rectification, Facilities and Engineering Overruns Service Points all beat target too. Projects achieved capital investment of £31.2 million, compared to a plan of £26.2 million.

Our Approach to Industrial Relations



- Sustainable relationships with Trade Union officers and local representatives
- Early notification of issues and timely consultation/negotiation (no surprises)
- Agreed process for wage negotiation
- **Outcome** – no strikes, reduced staffing levels, changed rosters

What Did We Do - Control Center



Old



New

Performance



In our first review period, we achieved:

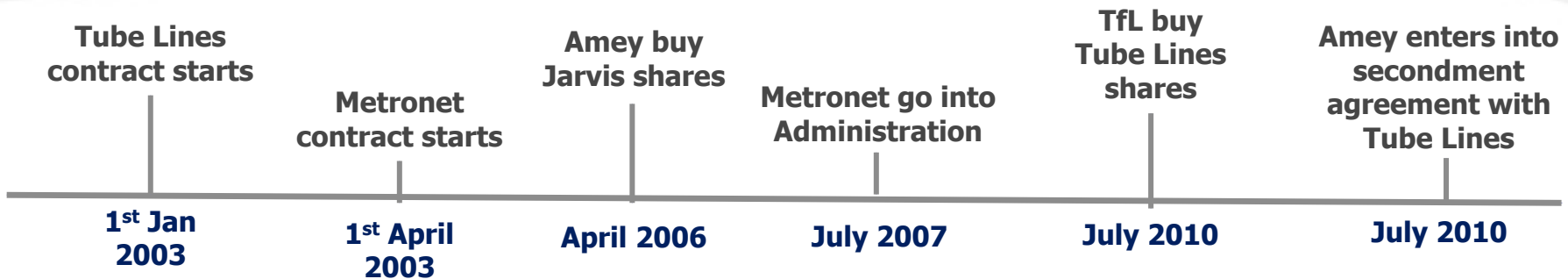
- 55% reduction in delays
- 29% reduction in train control failures
- 81% reduction in track failures
- 336% improvement in mean distance between rolling stock failures

In our stations, we raised reliability and expectations alike:

- mean time between elevator failures down by 34%
- reliability of escalators up by 33%
- overall satisfaction with station ambience up by 5%

Review Period 2

Moving into RP2

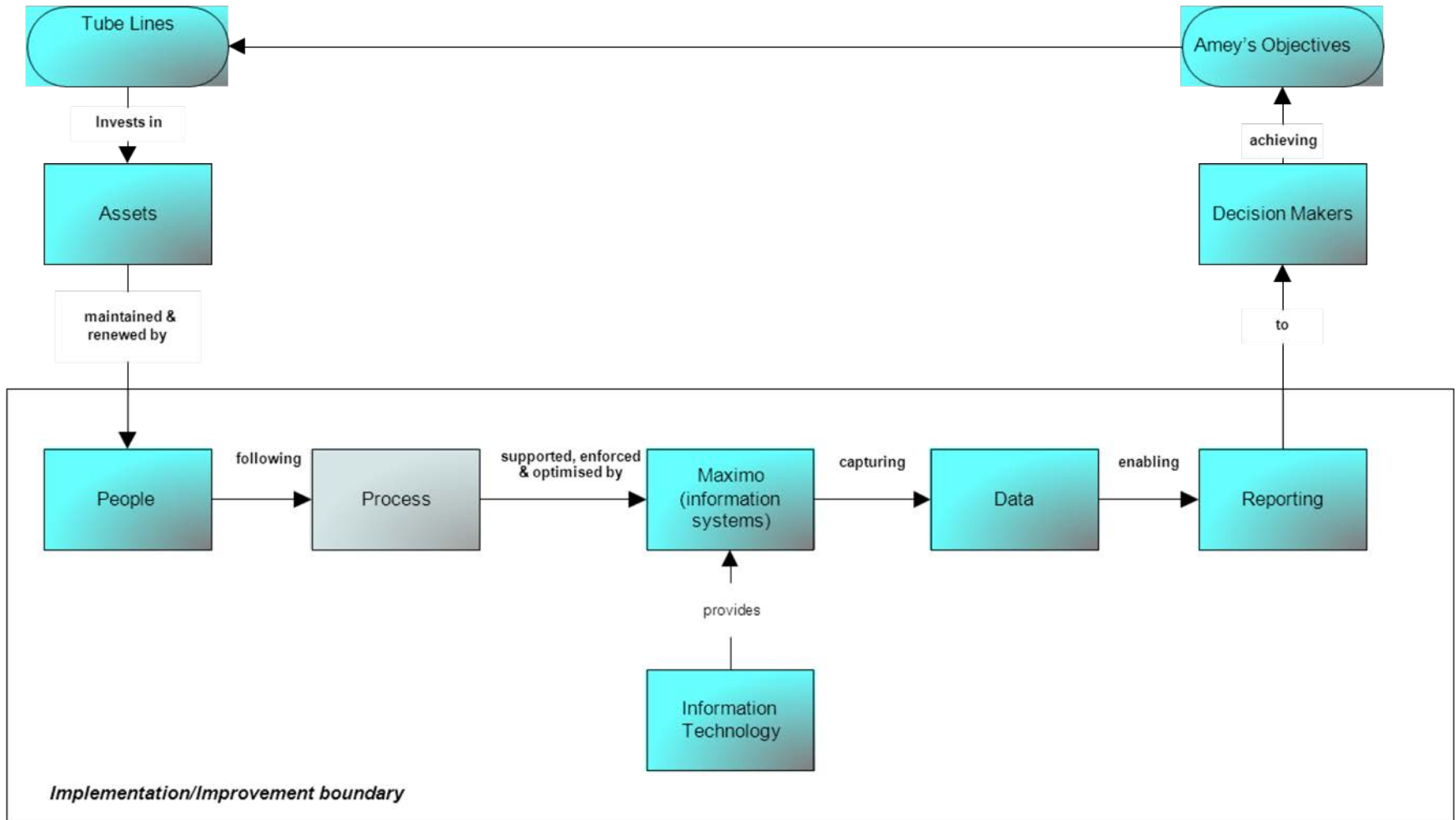


- TfL bought the shares of Tube Lines in June 2010
- Tube Lines remained as an independent company
- Secondment Agreement in place between Amey and Tube Lines
- Greater focus on Whole Life Asset Management
- We had the Olympics coming up – Jubilee Line performance critical
- Mayor's challenge - 30% reliability improvements & 30% cost reduction

Information Culture



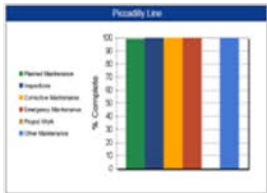
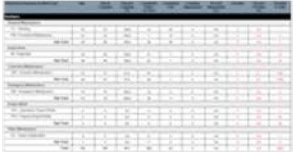


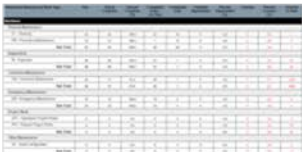



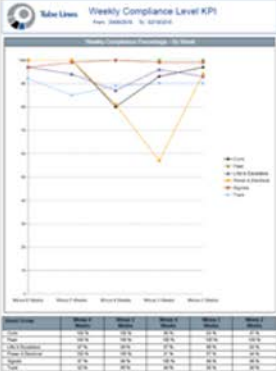


Asset Management in Tube Lines



Reporting to All Levels – Using Same Information



Compliance Reporting Process

<p>Asset Managers/ Maintenance Managers</p> <ul style="list-style-type: none"> - Daily - Asset/Line/Maintainer specific 	<p>Senior Management</p> <ul style="list-style-type: none"> - Weekly - Asset specific 	<p>Operations Pre Executive HSE/Assurance</p> <ul style="list-style-type: none"> - Period view - Weekly view - All Assets - All work types - Senior Managers present at Pre Executive Meeting 	<p>Board</p> <ul style="list-style-type: none"> - Period - All Assets - Planned work only - Part of Board Report
  	  	  	 

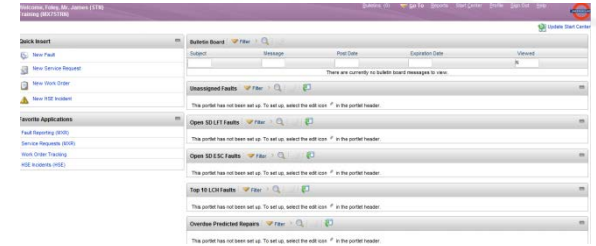
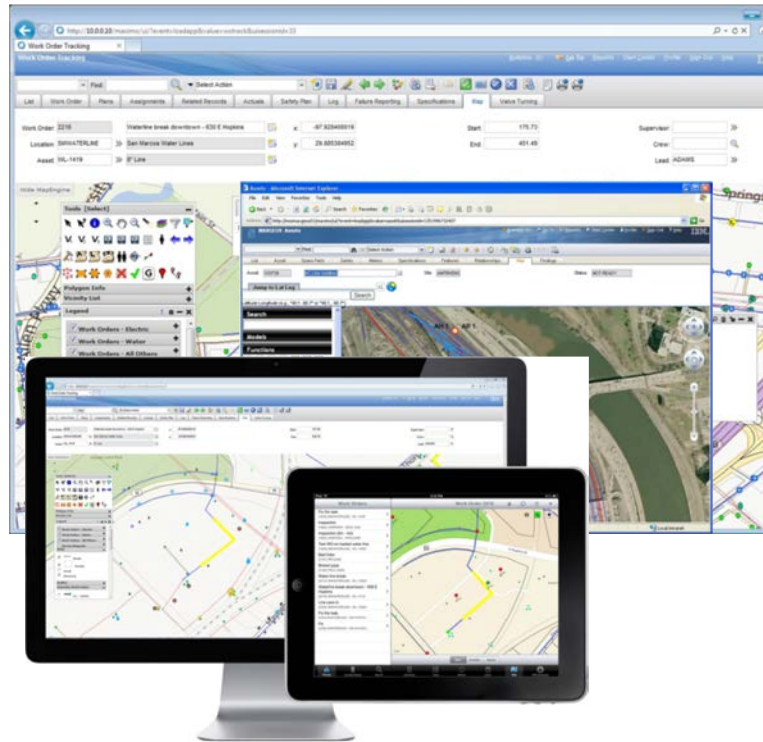
The Importance of Analytics



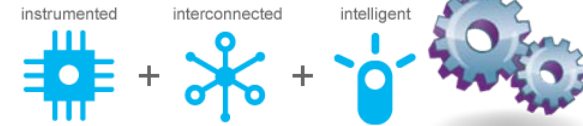
Mobilization

Visualization

Intelligent Control and Command (FRC)



RCM & Integration



Optimized Planning, Delivery, Safety & Materials

Predictive Asset Optimization/ analytics



Asset Configuration Mgmt

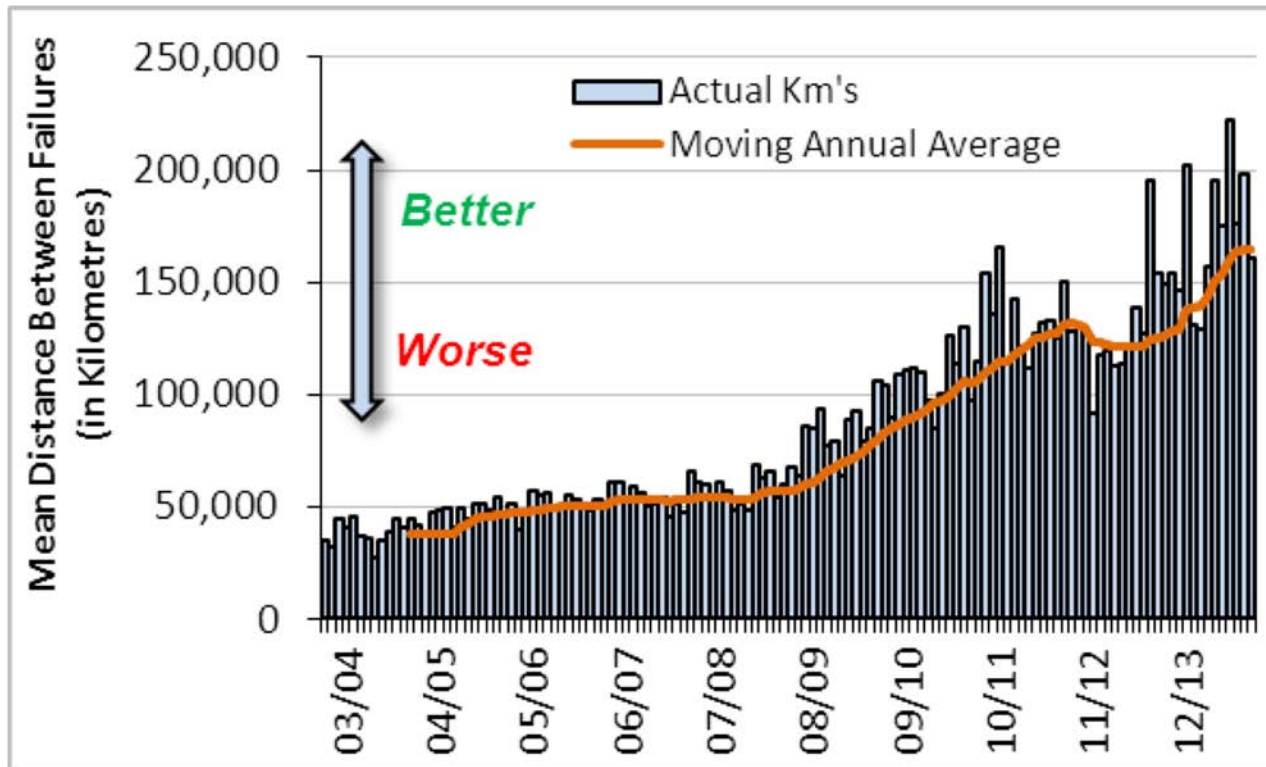
Organizations that lead in analytics outperform those that are just beginning to adopt analytics by 3 times

Outcomes

Rolling Stock Performance



Amey delivered a **478% performance improvement** in Rolling Stock Mean Distance Between Failure (MDBF) in 10 years



Rolling Stock - Example



Piccadilly versus Bakerloo rolling stock

No of Trains

- Piccadilly: 86
- Bakerloo: 36

No of Cars

- Piccadilly: 519
- Bakerloo: 252

Cost to maintain per car

- Piccadilly: \$38k
- Bakerloo: \$72k

Mean Distance Between Failure

- Piccadilly: 5 times higher than Bakerloo

Summary



- The Amey partnership seen as a success by London Underground
- Change management and whole life asset management essential part of Amey's operational model
- Successful Delivery also part of Amey's operational model
 - 26% more efficient than LU
 - 30% better reliability performance than LU

Thank You



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