

# **Thameslink Rolling Stock Project**

## **Industry Day**

**22 April 2008**

# **Welcome and Introduction**

John Gilbert

Deputy Director Procurement

# Purpose of the Day



- Explain about the project and the opportunity
- Explain the procurement process
- Give some 'flavour' behind the documents
- Provide an opportunity to ask questions

Note: Today's material will be placed on the DfT web site

# Domestic Arrangements



- Fire arrangements
- Toilets
- Mobile telephones
- Lunch

# Today's agenda



- Opening Address – Mike Mitchell, Director General, National Networks
- Programme Overview – Graham Dalton, Director Projects
- Technical Requirements – Derek Chapman, Deputy Director Technical
- Infrastructure Interface – Giles Thomas, Network Rail
- Commercial & Financial – Kate Mingay, Director Corporate Finance
- Operator's Perspective – Elaine Holt, First Capital Connect
- Procurement Process – John Gilbert, Deputy Director Procurement
- Questions

# Opening Address

Mike Mitchell

Director General, National Networks

# Overview



- Department's strategic objectives
- The need for Thameslink
- Interface with the High Level Output Statement (HLOS)
- Department's role on Thameslink
- Organisation



# Department's Strategic Objectives



Delivering Better Transport:

- Economic growth
- Environmental protection
- Transport safety
- Accessibility



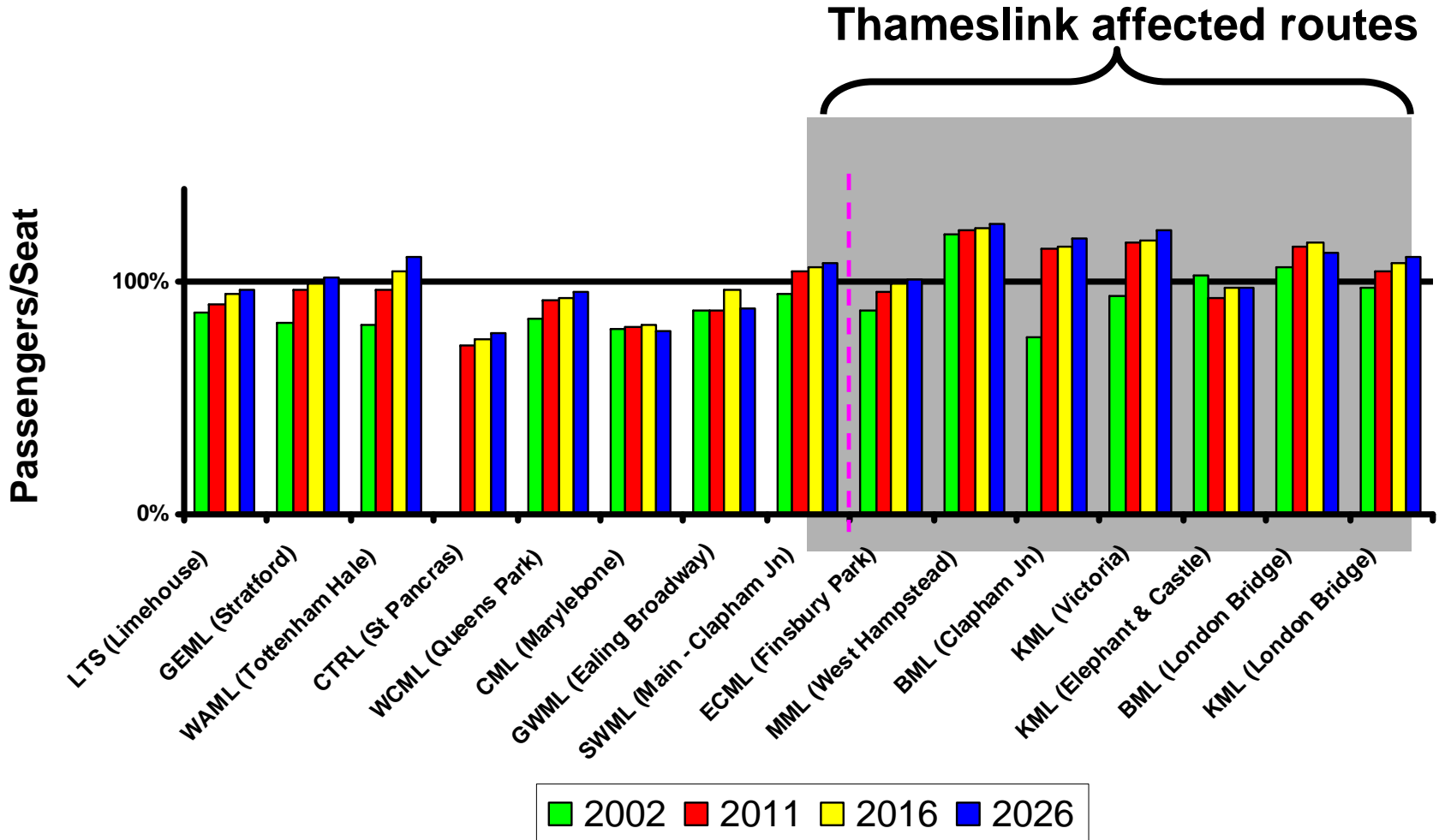
# Why Thameslink?



## Thameslink Programme:

- Announced with the White Paper 'Delivering a Sustainable Railway' in July 2007
- Addresses existing capacity issues and allows for expected demand growth
- A key element of the White Paper (HLOS) programme of capacity increases to address constraints on the network

# Growth and Passenger Capacity



# HLOS and Rolling Stock Plan

- HLOS and Thameslink are separate but linked programmes
- New vehicles for Thameslink are a component of the 1300 within HLOS
- The two programmes have overlapping timescales
- The extent to which the Thameslink vehicles overlap depends on:
  - the contracted delivery profile of the new Thameslink vehicles
  - the outcome of the HLOS design phase
  - the related HLOS infrastructure work required

# Thameslink Vision



- Increased capacity – longer trains, up to 240m length
- A highly reliable 24 trains per hour peak period service through the central London core by end 2015
- Optimised whole life project costs and whole industry costs (including operational and maintenance costs)
- Of the order of £1.5bn in investment in approx 1100 new vehicles

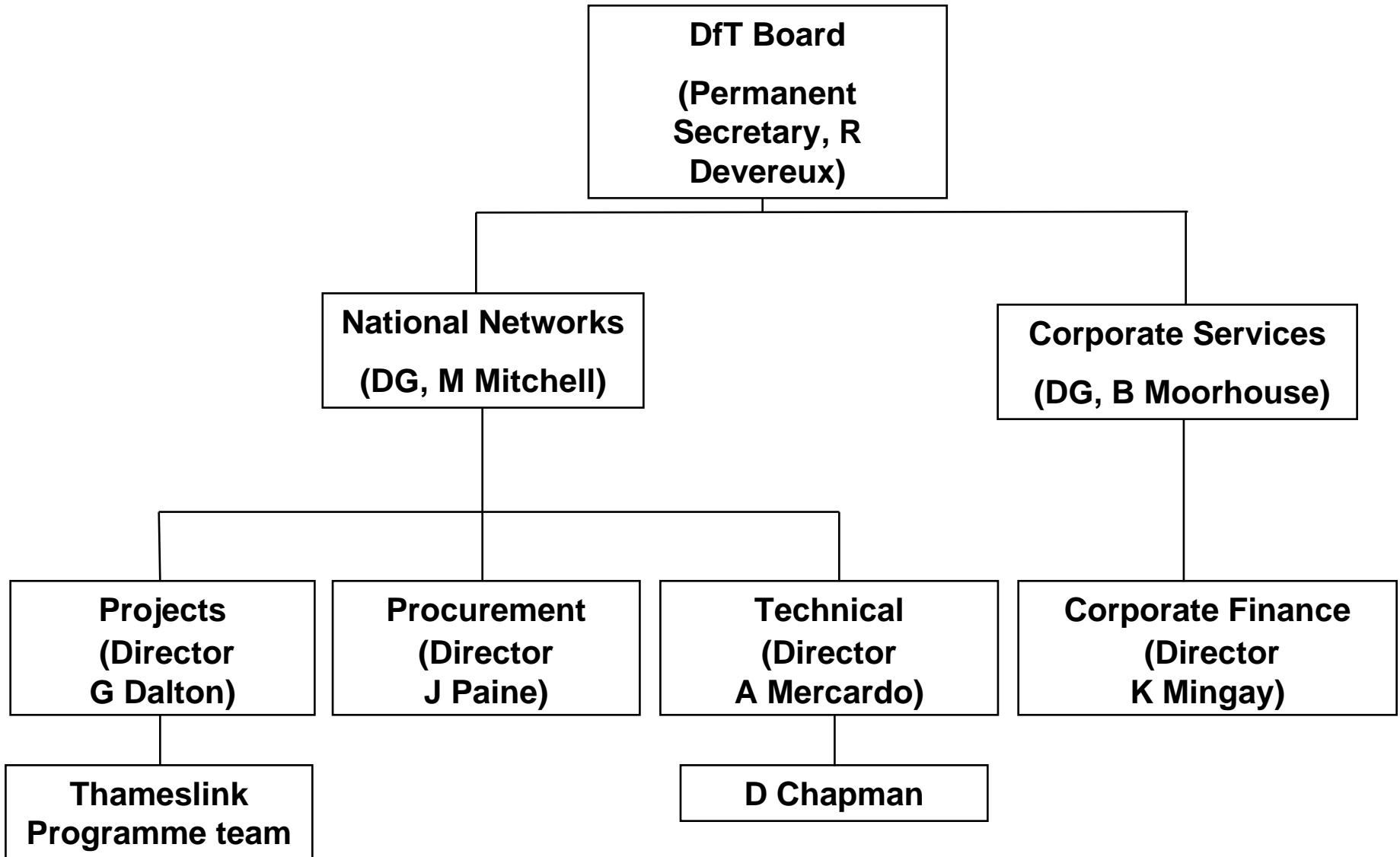
# Why is the Department leading?



A need to take leadership and work with industry to ensure that all parties work together:

- Thameslink is a highly complex programme
- Rolling stock specification and delivery must be aligned with infrastructure works and operations
- Integration risk rests with DfT
- Current franchise ends before full implementation of the programme
- But – working very closely with Franchisee and Network Rail

# Where does everyone fit in?



# Summary

- This is a serious project within a key DfT Rail Programme
- Passenger demand growth needs to be addressed
- We want a highly reliable service at 24tph
- Need to get whole industry / whole life VfM
- We can only make it work with industry support
- We are doing it to lead the industry

# Programme Overview

Graham Dalton

Director Projects



# Overview



- Department sponsorship
- Programme timescales and outputs
- The rolling stock project

# DfT Sponsor



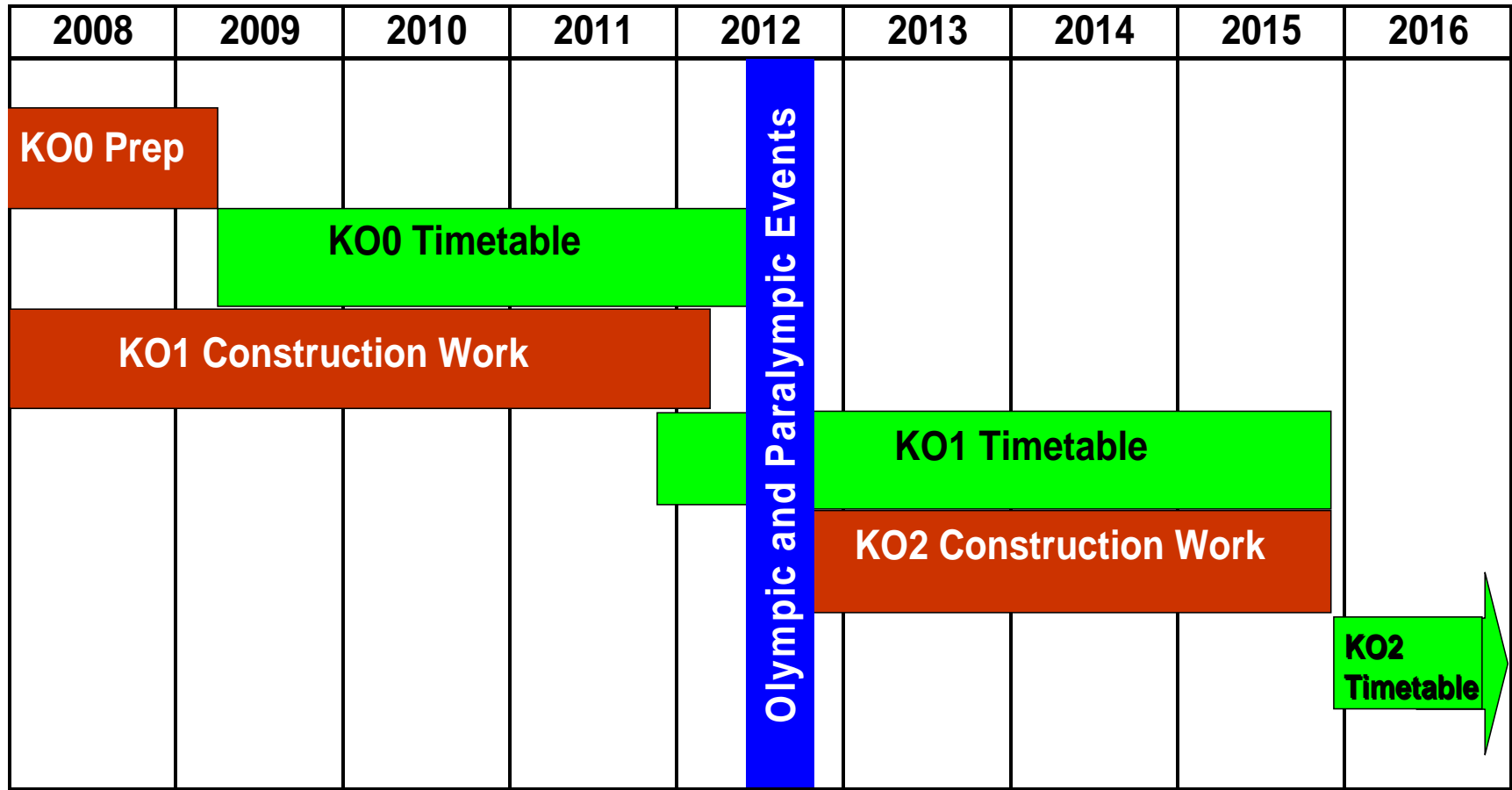
- Owns the business case
- Specifies programme outputs
- Monitors and challenges the delivery of programme elements
- Ensures that programme elements are integrated
- Ensures that the programme is deliverable and provides VfM for the taxpayer

# The Thameslink Programme

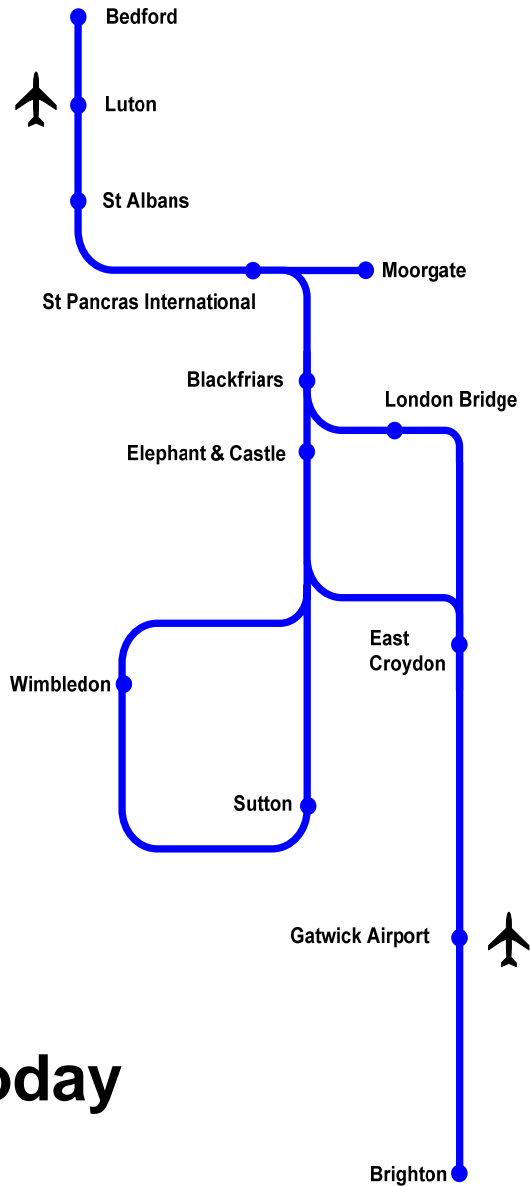


- Delivers increased capacity and reduced crowding on the Thameslink route
- Three Key Outputs
  - KO 0 – Enabling Phase Mar 2009
  - KO 1 – up to 12 car length Dec 2011
  - KO 2 – up to 24 trains per hour Dec 2015
- Three programme elements
  - Infrastructure – NR lead
  - Franchise – DfT lead
  - Rolling Stock – DfT initiate, TOC take over

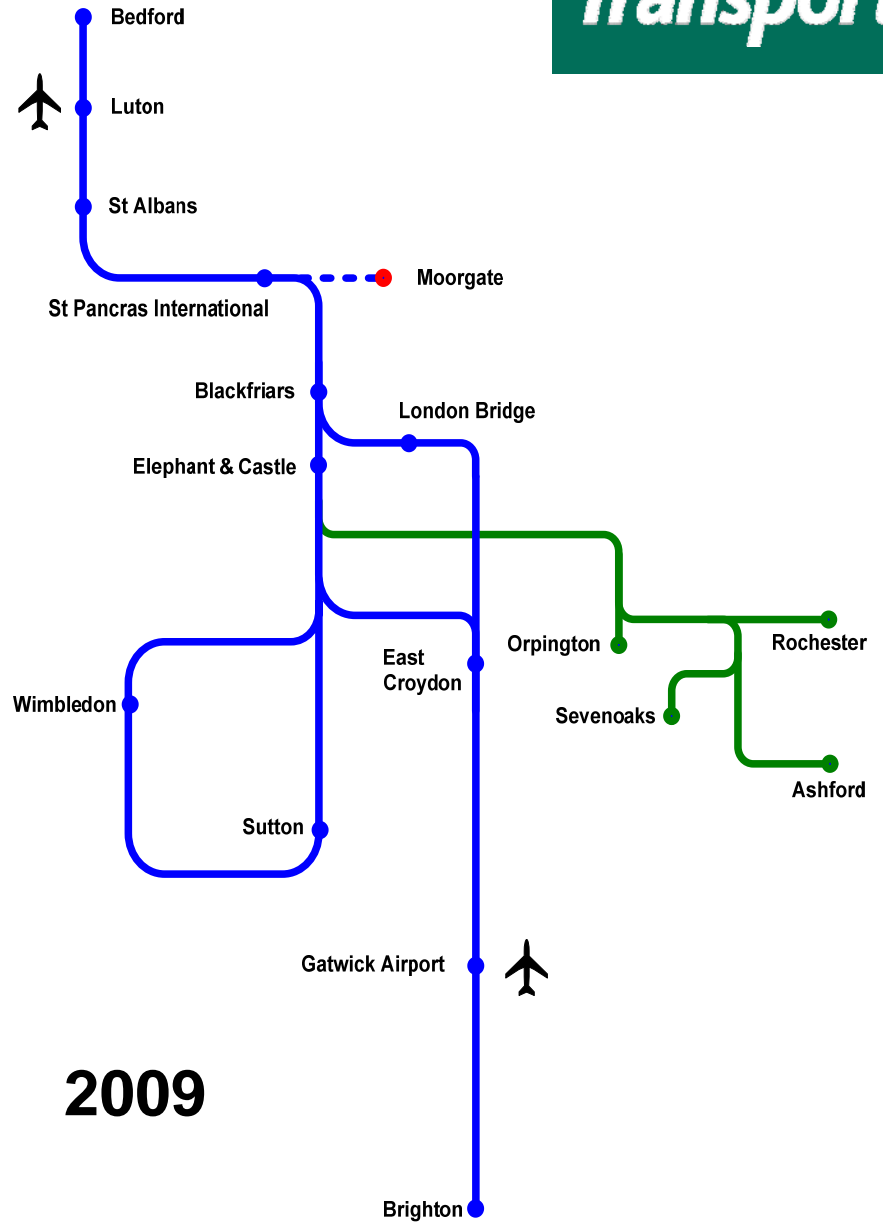
# Thameslink Programme High Level Schedule



# Key Output 0



Today

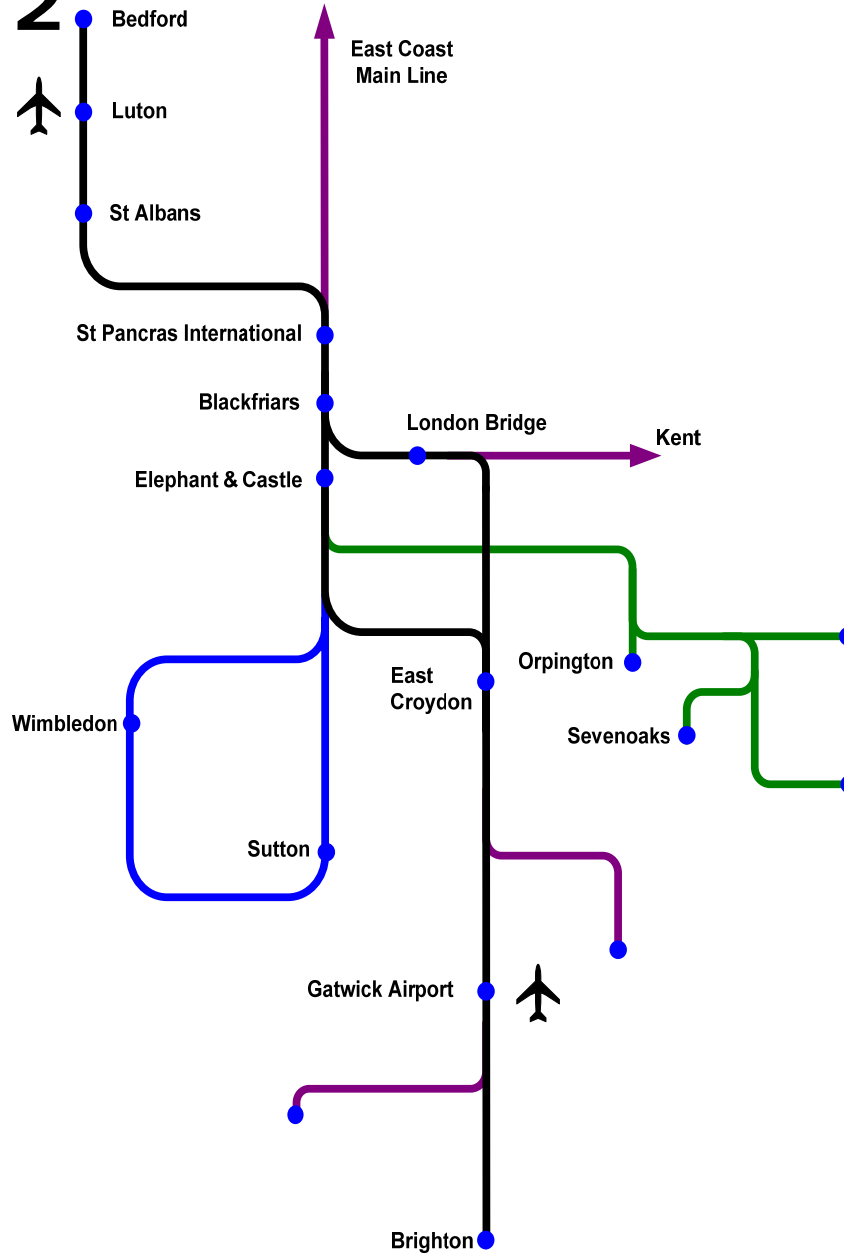


2009

# Key Output 1



# Key Output 2



# Rolling Stock Project Schedule



- Return Expressions of Interest 9 June 2008
- ITT issued Autumn 2008
- Contract Award Summer 2009
- First trains in passenger service February 2012
- Fleet introduction complete December 2015



# Depots

- Partial facilities required by 2011, with full facilities by 2015
- DfT will identify possible depot and stabling locations with NR and TOC
- Procurement approach and commercial structure under development

# High Level Train Functional Requirements



- Highly reliable
- Short dwell times
- Intelligent vehicle (tells passengers what they want to know, and tells maintainers what they need to know)
- Improved energy efficiency
- Optimised whole life and whole industry costs

# Technical & Operational Requirements

Derek Chapman

Deputy Director Technical & Professional

# Overview

- Key themes - what do new Thameslink trains have to deliver?
- Strategic and project needs
- Standards
- Infrastructure interface

# What do new Thameslink trains have to deliver? Key Themes

- The movement of high volumes of passengers: 24 trains per hour through the centre of London, serving a wide variety of destinations
- Highly reliable service: extremely low levels of service interrupting failure
- Reduced environmental impact
- Optimised cost/benefit for whole life, whole railway system
- Next generation of train complying with DfT Technical Strategy
- Opportunity for Bidders to introduce European and world best practice into the UK

# Strategic & Project Needs

## Critical Areas for ITT

- High capacity
- High performance
- Flexibility
- High reliability
- Reduced weight
- Low track damage
- High energy efficiency
- Passenger information



Collaborative work required between Bidders, the Department and Network Rail to finalise specification parameters in each area

# High Capacity: Train Performance

- Maintain current journey times overall
- Need for rapid platform reoccupation in central area and recoverability in approaches will drive acceleration and braking requirements
- 100 mph max speed
- Trains must be designed to accommodate Automatic Train Operation (ATO) to achieve consistent performance in the central area

# High Capacity: Dwell Time Management

- Design must cater for ~1,000 people to board or alight at one time
- 45 second dwell time needed to support capacity in central area (wheels stop to wheels start)
- Technical and operational systems must work together to maximise the time which doors are open
- 915mm platforms in the core – train floor height must be compatible with passenger flow needs
- Designing for accessibility (PRM TSI) presents a challenge



# Train Formation and Technical Platform



- “Standard” train for peak service will be nominally 240m long (max 243m)
- Some routes will be restricted to a maximum length of 162m
- Design must allow shorter trains to be lengthened to 240m later
- Shorter off-peak trains will give operating cost and carbon benefits
- Conventional and articulated solutions will be welcomed
- Same performance and operational characteristics for all units
- Interior flexibility – inner and outer suburban variants possible

# High Capacity: Passenger Movement and Interior Design

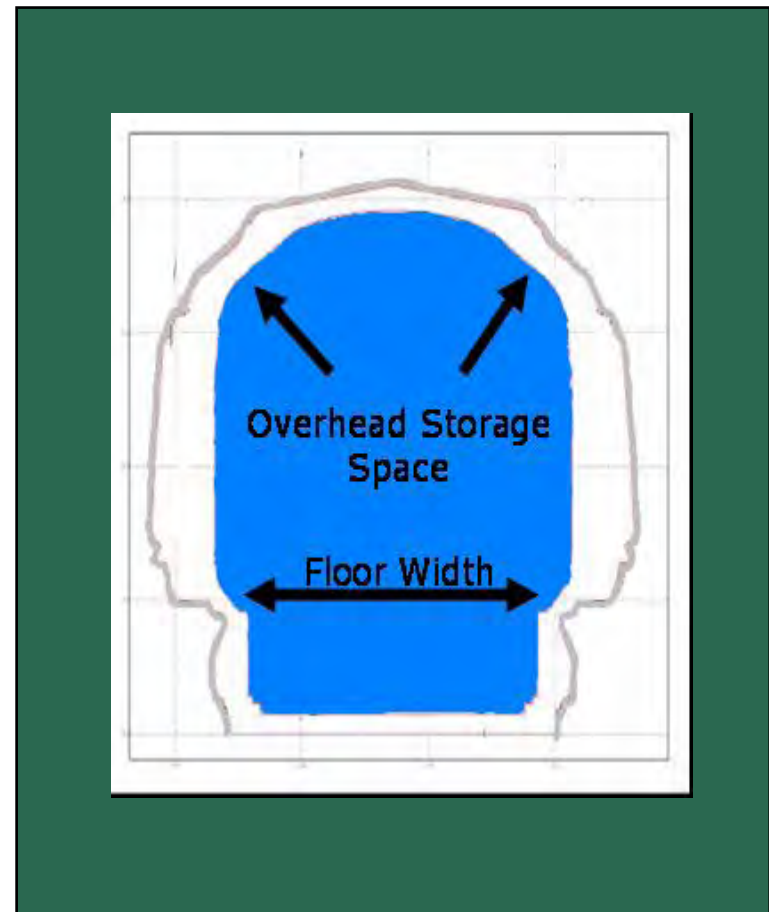


Extensive work undertaken with Passenger Focus and London TravelWatch:

- Wide doorways and large stand-backs
- 2+2 seat layout to ease flow and provide standing space
- Folding and tip-up seats to provide multi-functional spaces
- Open wide gangways may offer additional standing space
- Plenty of handholds for standing passengers

# Gauging

- Profile is critical for achieving interior space:
  - Floor height – maximising furnishable area
  - Luggage – overhead storage for an “airline” bag
- NR will determine the maximum possible Kinematic Envelope
- ‘Shadowing’ current vehicles will not be sufficient

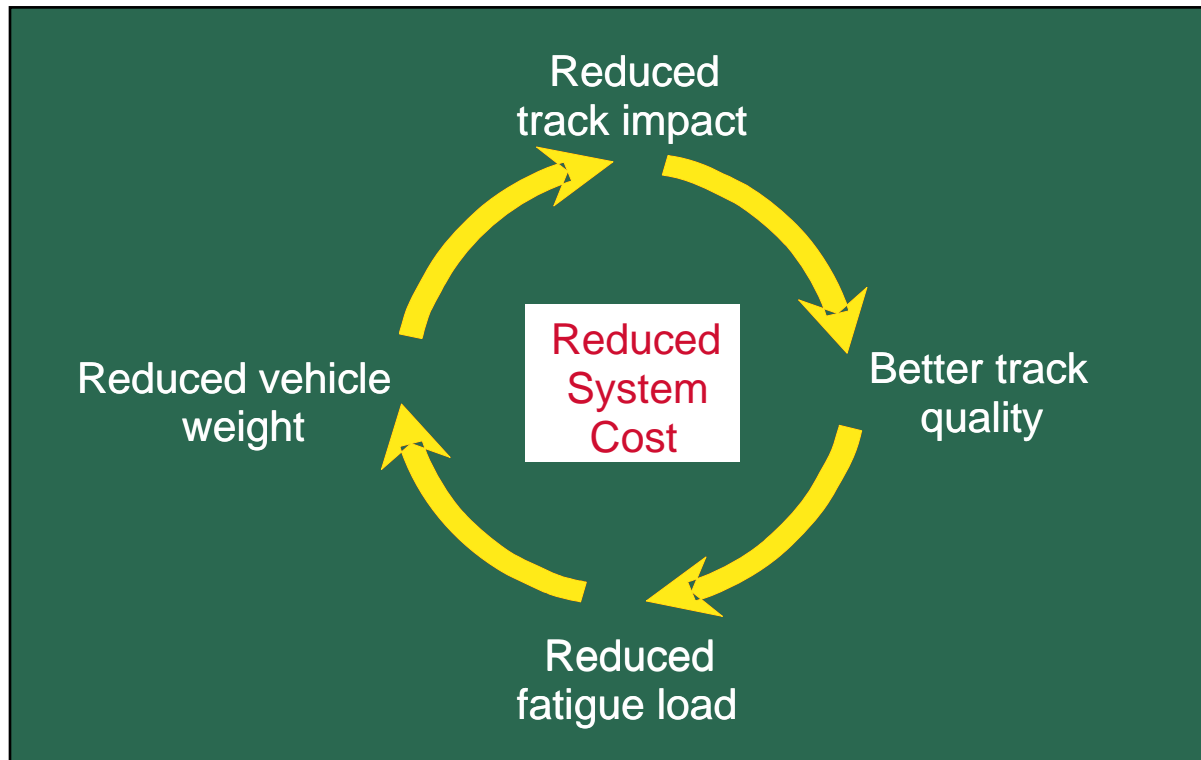


# Reliability

- Must be at least equal to current best performing EMUs:
  - But this won't be enough to deliver a reliable service through the central area
  - In the central area, specific requirements to prevent trains 'sitting down'
- Analysis (RAM) work will set demanding targets for degraded mode operation including traction and doors:
  - Automatic resetting and remote sub-system isolation
  - Predictive systems to avoid failures
  - Self rescue capability between designated refuge points
  - Push out capability

# Reducing Train Weight

- The Department wishes to work with NR and Bidders to establish a weight target which is challenging but achievable



- Scoring of bids will reflect the value of the issue, using the industry model to predict whole life, whole system cost

# Three ways to save energy

- Reduced train weight
- High efficiency traction systems:
  - Motor and traction configuration designed to maximise energy recovery
  - Recovered energy re-used within the railway system and the train, minimising net energy drawn from the supply
- Auxiliary systems designed to minimise energy use:
  - HVAC systems designed to respond to number of passengers
  - Intelligent control of lighting and heating when stabled

# Passenger Information System

- Critical requirement to support short dwell times
- Fully integrated system – consistent information on station and train
- Sequence and timing of Thameslink trains will be important, especially in disrupted conditions
- Customer feedback:
  - Connections are important (Thameslink, other TOCs, LUL)
  - Emphasises a need for text, audio and graphics
- Train will be linked to a central data source; must process and present information to meet customer needs

# Standards Compliance

- Train shall comply with legal requirements including Conventional TSI and National Notified Technical Rules
- Compliance with other British & European standards will be the norm
- Infrastructure interface will not be fully TSI compliant; Network Rail will provide guidance on applicable RGS and NR Company Standards
- Early challenge to "accepted UK practice" is encouraged where this is resulting in special designs and sub-optimal solutions



# Infrastructure Interface

- The interaction between train and infrastructure is critical for delivery of the objectives of the Thameslink Programme:
  - speed profile
  - dwell time
  - train control
  - platform length
  - gauge
  - track quality
- The Department is working with NR to create a Train-Infrastructure Interface Specification (TIIS)

# Thameslink KO2 rolling stock Infrastructure interface

Giles Thomas  
Enhancement Engineering

22<sup>nd</sup> April 2008

# Objectives

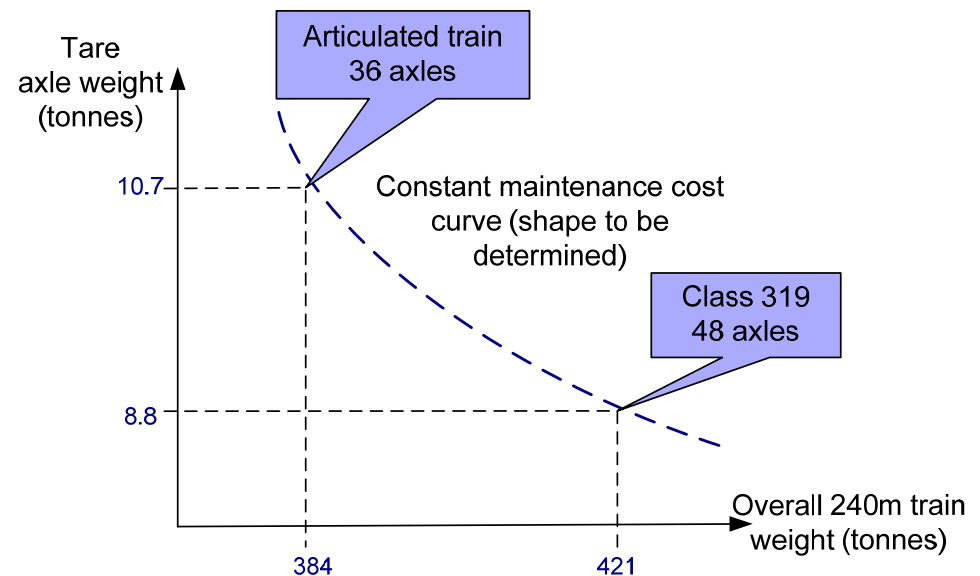
- Consider the whole life construction, maintenance and operational costs of both train and infrastructure systems together
- Identify options and develop solutions to achieve future punctuality and reliability targets
- Support the Thameslink KO2 rolling stock procurement from inception through to introduction of these new trains
- Work closely with the DfT, TOCs, and suppliers

# Realising delivery

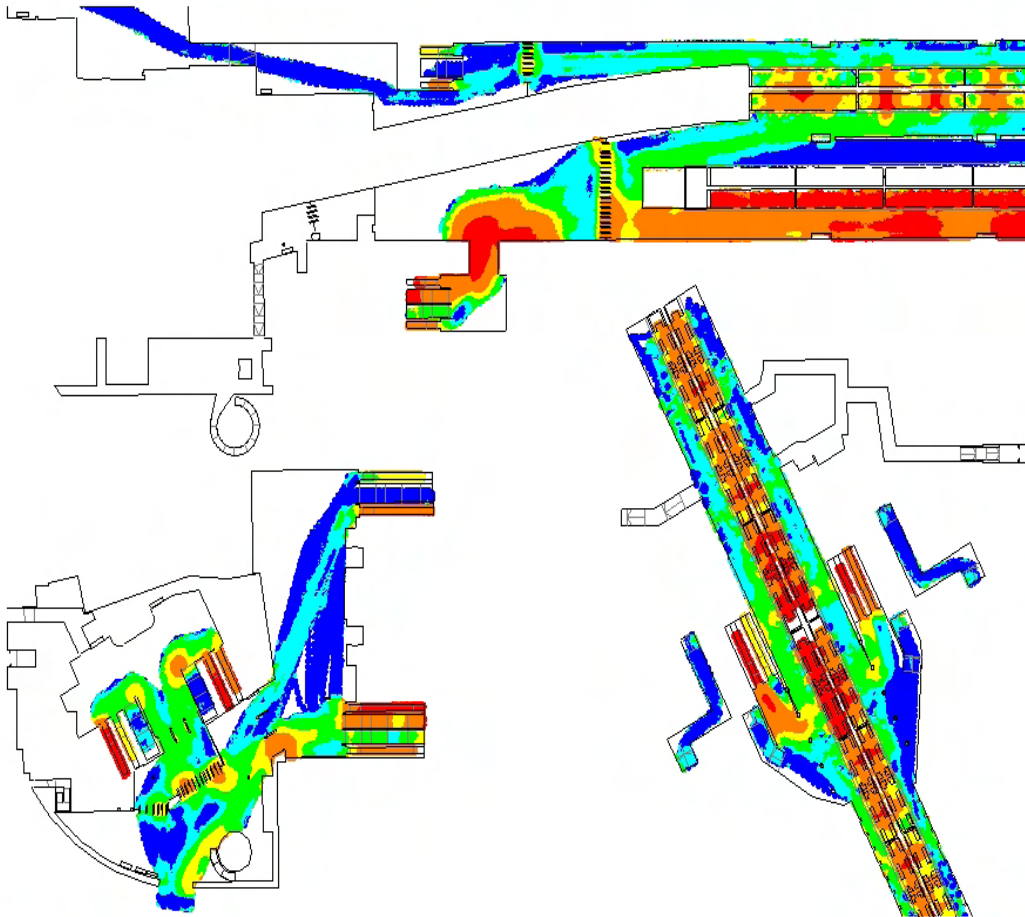
- Develop a programme of work to an agreed set of technical requirements
- Deliver the programme of work through regulatory settlement and the Thameslink Infrastructure Programme
- Achieve alignment with other key programmes to deliver the future railway
- Open exchange of information and change control with emerging vehicle definition

# Example 1: Track to train interface - working to accommodate alternative designs

- 24tph operation will increase track wear
- Strong focus on reducing the impact of new Rolling Stock using established industry models (VTISM)
- Recognise alternative Rolling Stock designs may present wider system benefits
- Level playing field for a whole system approach



# Example 2: Station flows and dwell time management



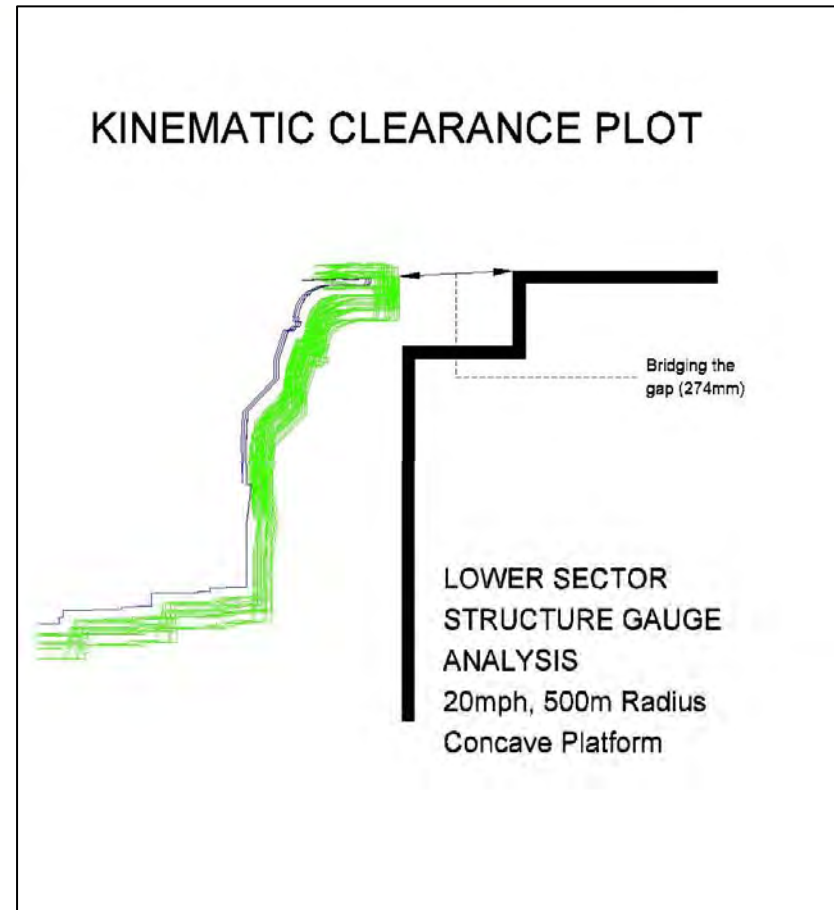
LEGION

08:45:00

- Blackfriars remodelled in morning peak
- Target 45 second dwell time
- Station, platform and train must work in harmony
- Key system performance driver

# Optimising stepping distance

- Must accommodate a range of existing platform heights
- Clear footfall hotspots
- Real challenges with platform curvature
- Range of possible solutions
  - Mechanical fixed
  - Mechanical automated



# Example 3: Reducing and optimising energy usage

- **Overhead Line 25kV AC Network**

- The project to make the UK overhead line network fully compatible with regenerative trains is due to complete by the end of 2008

- **Third Rail 750V DC Network**

- NR is supporting train operators in producing safety case for trains
- NR is undertaking risk assessment on individual electrical sections to understand the effect of prolonged circuit breaker tripping operational times
- NR is developing a scheme to segregate NR and LUL (2015 earliest)



# Other examples: Optimising train performance in the system context

- Reliability targets derived from overall railway system targets – using established tools and models
- Aligning infrastructure capabilities with the new in-cab signalling equipment
- Actively engaged in reviewing automatic train operation options
- Providing for Driver Only Operation and other train dispatch methods at high footfall stations
- Strong focus on Customer Information System alignment

# Summary

- The solution to achieving overall system performance lies in the effective design and integration of the rolling stock and infrastructure subsystems.
- The issues highlighted here are key. You may have others. We are ready to listen and react.
- We look forward to working with you and are committed to doing so.

# Commercial and Financial Overview

Kate Mingay

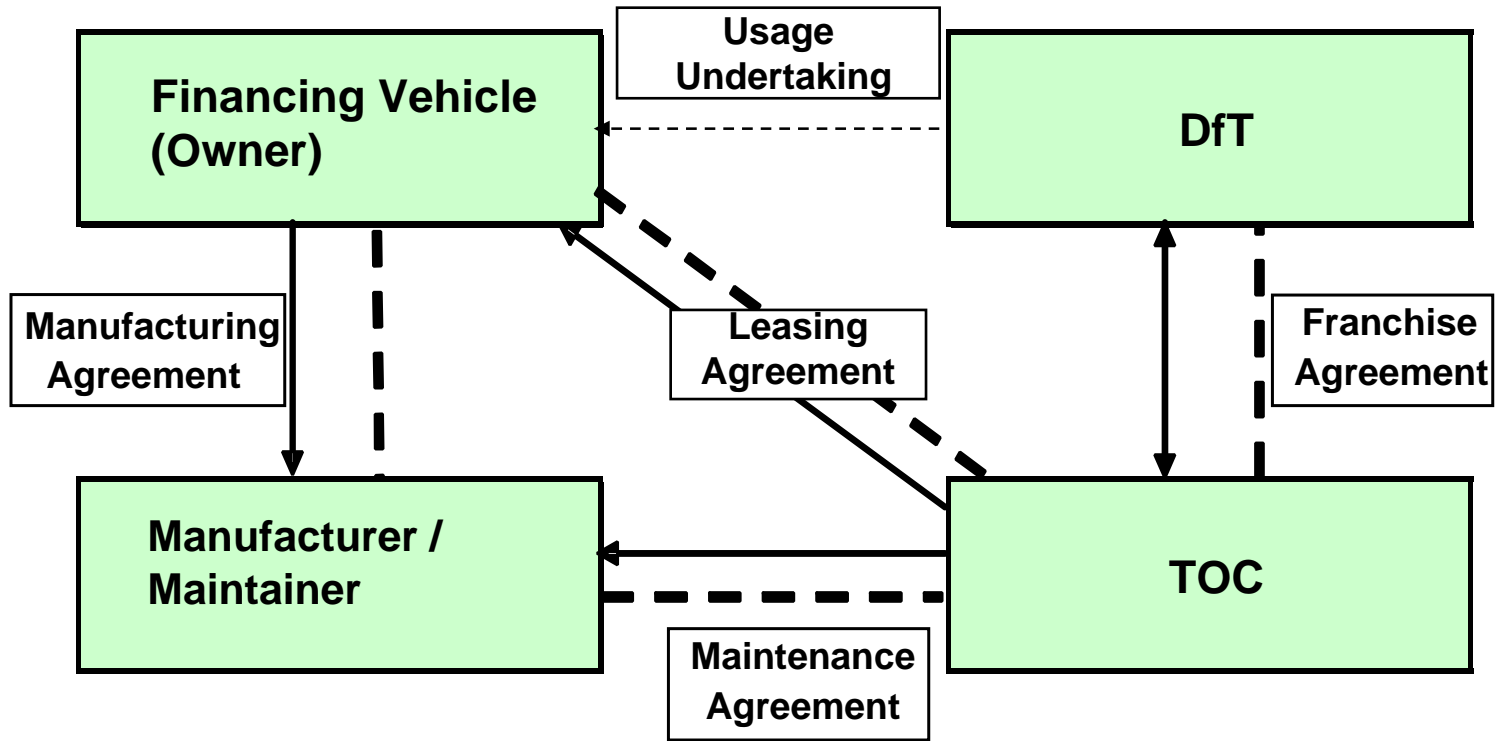
Director Corporate Finance

# Presentation Overview



- Bundled Design Build Maintenance + Finance (DBM+F) - commercial structure and payment streams
- Risk Allocation
- The Thameslink approach is different from IEP
- What the Department is looking for in response to the AQ and the ITT
- Conclusion / summary

# Contract Structure



## Legend

Agreements - - - -

Cash Flows ←

# Rental Payment Streams

- TOC will make rental payments to the owner
- Owner comfort about payments stream:
  - Section 30, Railways Act 1993 places a statutory obligation on the Secretary of State to ensure continuity of passenger services
  - Section 54, Railways Act 1993 gives the Secretary of State the right to give undertakings to promote investment in the rail industry, e.g. regarding future franchises and asset usage, subject to certain conditions being met
- Policy on usage guarantee is yet to be finalised but will be designed to secure best whole life value for money
- Department is keen to incentivise the owner to address any persistently poor performance of its stock

# Risk Allocation Overview

<b>Manufacturer / Maintainer</b>	<b>Funder / Owner</b>	<b>DfT</b>
<ul style="list-style-type: none"><li>• Design</li><li>• Build</li><li>• Acceptance into service</li><li>• Performance, reliability, quality</li><li>• Maintenance</li></ul>	<ul style="list-style-type: none"><li>• Residual Value - after expiry of any usage undertaking</li><li>• Some performance, reliability and quality risk</li></ul>	<ul style="list-style-type: none"><li>• Integration of infrastructure, franchise and trains</li><li>• Usage guarantee</li><li>• Output specification</li></ul>

# Risk Allocation - Train Acceptance



- Payment linked to successful acceptance into service
- Train acceptance is primarily a manufacturer risk
- Department intends to provide objective, transparent and clear obligations and incentives for all parties
- Thameslink TOC will have obligations to facilitate acceptance



# Risk Allocation – Maintenance (1)

- Maintenance to be bid for by the manufacturer and evaluated as part of the overall bid
- Maintenance price bid for 30 years, minimum maintenance period 7-10 years
- Owners will have the usual rights to ensure the subsequent maintenance contractor maintains the assets' value
- TOCs will make payments for maintenance to the maintainer
- Performance and KPI regimes with the maintainer to encourage highly available, reliable trains that deliver a specified customer environment

# Risk Allocation – Maintenance (2)

- Some tasks likely to be allocated to the TOC, e.g. servicing and cleaning, and a close working relationship with the TOC will be required
- Department investigating depot procurement options ready for the ITT
- Intention is to advise Bidders where the depot(s) could be, and possibly require them to procure the depot facilities
- As a minimum, the maintainer will be closely involved in the depot specification and design

# Why is Thameslink Different From the IEP Train Procurement?



- Each procurement considered on its own merits – no “one size fits all” solution
- “Metro” nature of Thameslink services makes it more important for TOC and maintainer to work closely together
- Incremental development of existing, proven technology with design requirements building on current best practice
- Department wants some flexibility about the long-term maintenance arrangements

# Financed Bids



- The Department intends that it will require the chosen bidder to arrange the finance necessary for the acquisition and ownership of the rolling stock
- Consistent with HMT best practice, the Department will reserve the right to hold a funding competition

# What the Department is Looking for in Response to the AQ

The Applicant should demonstrate experience of:

- Managing financial risk surrounding delivery of major projects
- Working with financiers to deliver large, complex projects outlining any steps taken to support efficient financing
- Arranging / raising long term finance for major projects

Where the Applicant includes, or has appointed, a financial adviser:

- Demonstrate the adviser's experience of arranging / raising finance for major projects

# Conclusions / Summary



- Thameslink Rolling Stock procurement will be a bundled DBM+F deal, based on a lease structure but with funders / owners taking some additional performance risk
- Department sees real value in the owner of the stock engaging effectively in the design, build and subsequent performance of the stock, right from the bidding stage



# The Operator's Perspective


**Elaine Holt**

**Managing Director, First Capital Connect**

# The Operator's Perspective

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## A New Train is for Life


- The train must meet customers' requirements now and in 30 years time.
  - Above all customers want a reliable and punctual train service – performance that meets the demands of the route and service pattern is key.
  - The specification and design of a train probably locks in 90% of the performance and whole life cost of the train for the following 30-40 years. All parties must work together to achieve a successful product design.
  - The customers' needs come first at every stage of the lifecycle.
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# The Operator's Perspective

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## What makes the TLP train different?

- Customer expectations for a £5.5bn transformation of TL will be very high – the trains are the most direct manifestation of this from the customer's aspect.
  - These trains will set the standard for a generation of trains that will support the 21st Century modernisation of the railways in the UK.
  - These trains will be designed to operate as part of an integrated railway system that meets the needs of 21st Century customers.
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# The Operator's Perspective

## What the Operator is expecting to see in the tender offers?

- A train that has generic commonality with the latest European and global generic designs to maximise synergies throughout the life cycle – not another unique UK generation of trains:
  - World class reliability (system recovery from failures in seconds not NFRIP minutes);
  - Interior comfort levels that win accolades around the world;
  - Complete rethink and innovation on provision of customer information – TL routes serve the full range of markets: commuters, leisure, business, international;
  - The new trains must feel safe as well as being safe;
  - Extreme simplicity in design in terms of functionality and maintainability;
  - A train that will attract the next generation of people to work in the rail industry.

# The Operator's Perspective

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## Our role in the delivery of this train

- We have been supporting DfT for many months on the High Level Specification and will be fully involved in helping set the detailed Specification and in the tender and contract award process.
  - We are also supporting DfT and NR in determining the Depot and Stabling strategy.
  - We will be the Operator introducing the new fleet and integrating them into our operations. This makes us highly committed to making sure that they work as specified from the start.
  - We also want to be here for the long term, so want to ensure that the train and the contractual relationships are designed to provide a reliable and high performing service that meets the needs of our customers.
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# Procurement Process

John Gilbert

Deputy Director Procurement

# Overview



- Overall Procurement Strategy and Values
- How it works generically
- The Thameslink Rolling Stock procurement process

# Department Procurement Strategy



- Compliance
- Deliverability
- VfM...price/quality
- Governance
- Lessons learned
- Values

# Department Procurement Values



- Consistency
- Clarity
- Certainty
- Transparency
- Scrutiny
- Continuous improvement of Plan – Buy – Do approach

# Plan – Buy – Do Approach



- Plan = “challenges, options, solutions”
- Separation of duties under Treasury rules
- Working together to achieve “...***most advantageous economic solution***”
- Sponsor, Buyer, Contract Manager
- Contract Award Committee
- Anonymised selection and approval



# Contract Award Committee



- Chaired by Director Procurement: awards high-value, high-risk contracts
- Brings together SRO, Sponsor, Project Manager, Procurement Manager & Contract Manager
- Meets prior to SoS key decision points: PIN, OJEU, ITT & Contract Award
- Takes decisions and makes recommendations to RIB & SoS

# Anonymised Selection and Approval



- Identity of Bidders known only to small number of staff
- Allows for objective selection against published evaluation criteria
- Used at short-listing of applicants and at contract award
- RIB, SoS & senior staff do not know Bidders' identity

# Does it Work?



- Reviewed by NAO, OGC, Treasury & ARA
- Publish as much as we can on the DfT web site, including evaluation processes and ITTs
- Winner / loser debriefs
- Lessons learned
- Continuous improvement
- Launched new Commercial Strategy in early April – now on the DfT web site

# Thameslink Rolling Stock Key Dates



- 9 April 2008 – OJEU and Accreditation Process Docs
- 9 June 2008 (noon) – Return of Expressions of Interest
- July/Aug 2008 – DfT short-lists Bidders
- Autumn 2008 – Issue ITT to Bidders
- Winter 2008/9 – Receive Proposals from Bidders
- Summer 2009 – Sign Contract

# Accreditation Process - Structure



- Model based upon DfT's established process
- Applicant information (Pass/Fail)
- Financial Standing (Pass/Fail)
- Business Excellence & Approach (40%)
- Technical Capability & Experience (60%)

# Accreditation Process – Key Messages



- Expecting applications to be led by manufacturers
- Business Excellence & Approach section intended to ensure Department's suppliers are committed to continuous improvement
- Technical Capability & Experience questions have been constructed to explore the capability to meet the needs of this project
- Financial capability section intended to demonstrate that you and your advisers are experienced in raising finance
- Clarification Q&A process for Applicants – deadline 19 May

# Activity after 9 June 2008



- Evaluation of Applications
- Engagement with Applicants on technical development and other ITT issues begins
- Short-listed Bidders approved and announced
- Feedback provided to Applicants
- Data Site opened for Bidders
- Finalisation of ITT documents (Bidders consulted)
- ITT issued (two-way communication and clarification continues)

# Activity after ITT Issue

- Tenders returned
- Evaluation of Tenders based on most economically advantageous overall offer
- Negotiations with Bidder(s) - not expecting to use a BAFO stage
- Contract Award
- Feedback to Bidders



# Questions

(e-mail: [trsp@dft.gsi.gov.uk](mailto:trsp@dft.gsi.gov.uk))