

Outline

<i>Overview of Britain's Rail System</i>	<i>Page 3</i>
<i>Capital Projects Case Studies</i>	<i>Page 7</i>
<i>Challenges of Upgrading a Live Railway</i>	<i>Page 11</i>
<i>Lessons Learnt</i>	<i>Page 13</i>
<i>Conclusions</i>	<i>Page 17</i>

© Network Rail Consulting

The contents of this presentation remains the intellectual property of Network Rail Consulting and may be used only in connection with the brief for which it was submitted. It is specifically forbidden to communicate the contents to any third party without prior permission in writing from Network Rail Consulting, and all reasonable precautions must be taken to avoid this occurring.

Overview of Britain's Railway System

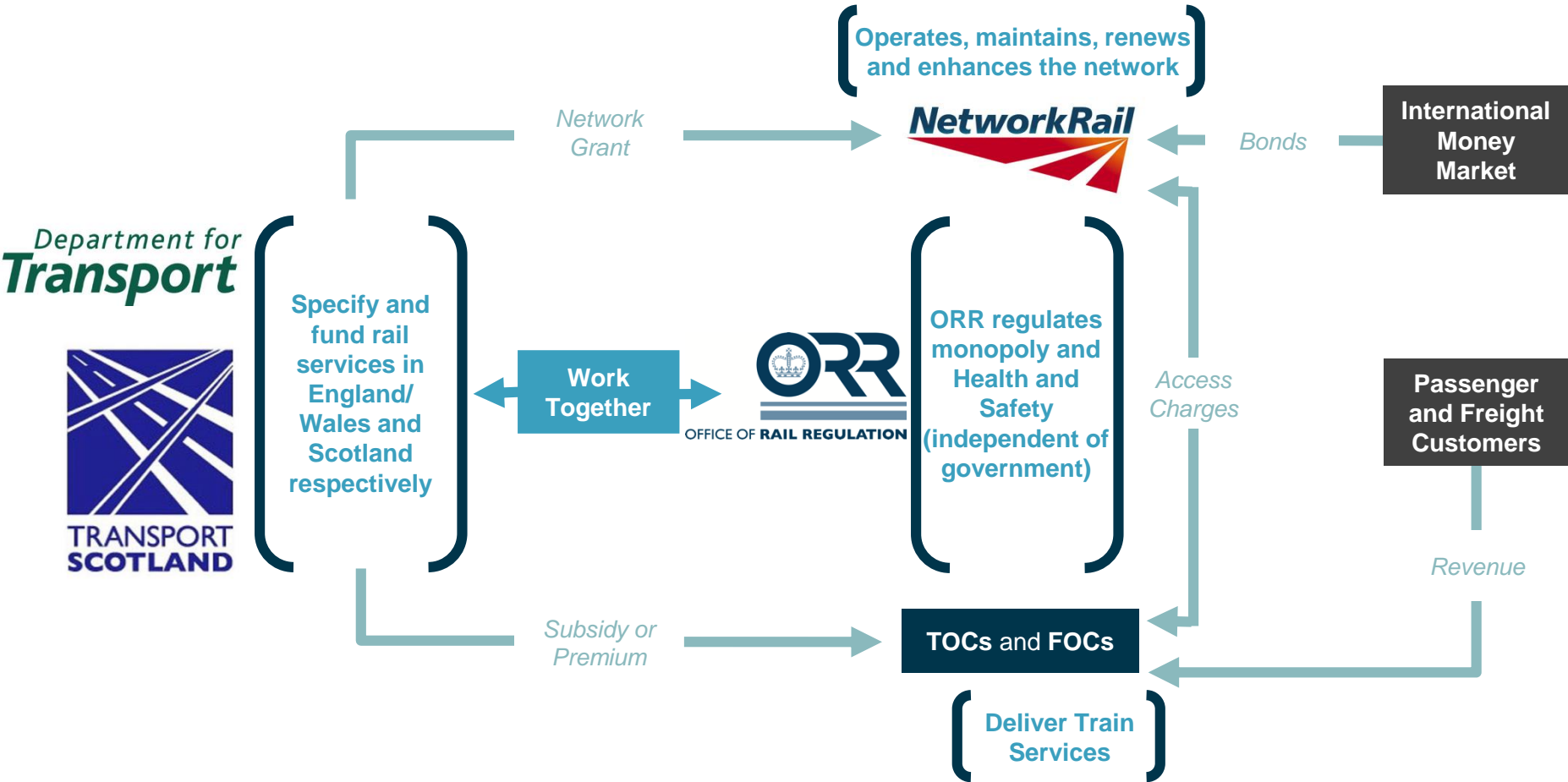


Overview of Network Rail

- ▶ We own, run, maintain and develop 20,000 miles of track, 40,000 bridges, 48,000 signals and 700 tunnels
- ▶ We own 2,500 stations and operate 19 major stations
- ▶ We carry 20,000 train movements every day
- ▶ We own and operate the second busiest railway in Europe, and the fifth busiest in the world
- ▶ We operate and maintain the UK's high speed rail infrastructure
- ▶ We are a £6bn business with 35,000 staff



Key Industry Stakeholders



Track Access Agreements



Rail services on Network Rail's infrastructure are provided by 31* operators under regulated access contracts. These track access contracts capture:

- ▶ Number, frequency and other characteristics of the operator's services
- ▶ Routes covered by the contract
- ▶ Restrictions of use, e.g. related to engineering access
- ▶ Track charges
- ▶ Performance regime

Network Rail is legally required to reimburse train operators in case of unavailability of the infrastructure

- ▶ Schedule 4: service variations by Network Rail
- ▶ Schedule 8: performance regime

Consulting

Capital Projects – Case Studies



Kings Cross Station Redevelopment

Project

King's Cross Station Redevelopment Programme

Client

UK Department for Transport

Location

London, UK

Start Date

2008

End Date

2012

Duration

42 months

Contract Value

£550m

Network Rail's Role

Project Development & Feasibility, Project & Programme Management, Design Manager



Scope of Works

- ▶ Originally opened 1852, last renovation was 1972
- ▶ 11 platforms
- ▶ 47 million passengers per annum

Scope of Works

- ▶ 1,700 tonne geodesic steel and glass dome
- ▶ Underground ticket hall
- ▶ New 12 car platform (300m)
- ▶ 4,000 m² of refurbished office space
- ▶ 20,000 m² of renewed main shed roof
- ▶ 2,500m² of photovoltaic panels to generate 10% of the station's power needs.

Key Project Outputs

- ▶ A new western concourse, 4 times the size of the existing one
- ▶ Wider range and quality of commercial outlets
- ▶ Better interchange with LUL & St Pancras International Station
- ▶ Renewed main shed roof to provide better lighting.

Thameslink – Phase 1

Project

Thameslink Programme – Phase 1

Client

UK Department for Transport

Location

London, UK

Start Date

2008

End Date

2013

Duration

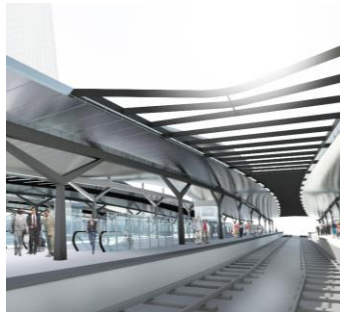
72 months

Contract Value

£2bn

Network Rail's Role

Project Development and Feasibility, Project and Programme Management



Scope of Works

- ▶ North – South rail services through London re-opened in 1988 via Thameslink tunnel
- ▶ Increased demand has necessitated a significant upgrade in capacity

Scope of Works

- ▶ Complete rebuild of Blackfriars station
- ▶ Major rebuilding works at Farringdon station
- ▶ Construction of a twin-track viaduct at borough station
- ▶ Platform lengthening at City Thameslink
- ▶ Platform lengthening works at 14 other stations
- ▶ 9km of new track renewed
- ▶ 36 new switch and crossing units
- ▶ Extensive power upgrades
- ▶ New Signalling system installed in the core areas.

Key Project Outputs

- ▶ 8 to 16 trains per hour through core section
- ▶ 850 kwh per annum of solar energy
- ▶ 8 to 12 car operation

Reading Station Area Redevelopment

Project

Reading Station Area Redevelopment

Client

UK Department for Transport

Location

Reading, UK

Start Date

2011

End Date

2015

Duration

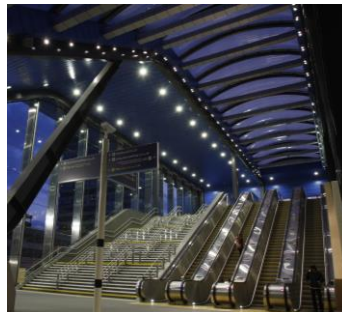
72 months

Contract Value

£850m

Network Rail's Role

Project Development and Feasibility, Project and Programme Management



Background

- ▶ 730 trains every day
- ▶ 14 million passengers
- ▶ Current track layout at the station and limited platform space form a bottleneck
- ▶ Delays at Reading affect services from London to South West England and Wales

Scope of Works

- ▶ New signalling centre and train maintenance facility
- ▶ New transfer deck and escalators to platforms
- ▶ Grade separation by provision of elevated mainline
- ▶ Grade separation of the western chord
- ▶ Extensive track layout reconfiguration

Key Project Outputs

- ▶ A minimum of 4 additional train paths per hour in each direction
- ▶ 5 additional platforms
- ▶ 125% improvement on through line platform capacity
- ▶ 38% improvement in service performance

Consulting

The Challenges of Upgrading a Live Railway in Britain



Challenges (1/2)

Safety

- ▶ Safest railway in Europe*
- ▶ Best in Europe at managing passenger & level crossing safety*
- ▶ 3rd safest at managing employee safety but does not compare well with other industries*
- ▶ Continuous improvement programmes on-going

Performance regime

- ▶ NR needs to return access to train operators on time
- ▶ Significant financial penalties apply for possession overruns

Maintaining capability

- ▶ 1m more trains on network than 10 years ago – now 7m per annum
- ▶ Capacity needs to be maintained.

* ORR Health & Safety Report 2003 (based on data from European Commission)



Challenges (2/2)

Minimising disruption

- ▶ Limited access times drive innovation and precision planning
- ▶ 5 hr overnight possessions and 3-7 days possession during national holidays
- ▶ Modular switches & crossings have significantly reduced time to complete renewals
- ▶ Punctual arrival of engineering trains is essential given most work is undertaken in overnight possession
- ▶ Investment in mechanisation – high output trains

Competing priorities

- ▶ Concentration of longer line possessions at Christmas and Easter place peak demand on fixed critical resources such as signal testers, tilting wagons and railway cranes.
- ▶ Careful planning of resources is essential in order to not overcommit and allow for float in resources



Lessons Learnt



Lessons Learnt (1/2)

Design Development

- ▶ Governance for Railway Investment Projects (GRIP)
- ▶ Eight stage gateway approval process

Stakeholder Management

- ▶ Dedicated comms specialists for major projects
- ▶ Outreach programmes; visitor centres, information stands, leaflets drops, signage at stations

Contracting Strategy

- ▶ Varies by project complexity, value of work and scarcity of resource
- ▶ Increasing supplier dialogue, directly and via trade organizations
- ▶ Increasing amalgamation of design and build to reduce risk
- ▶ Emphasis on collaborative engagement



Lessons Learnt (2/2)

Collaborative Working

- ▶ British Standard 11000 on collaborative working
- ▶ New forms of collaborative agreements
- ▶ Investment in supporting behavioural change
- ▶ 12 projects worth £3bn covered by collaborative framework



T-Minus Planning

- ▶ Detailed resource planning of critical labour and machinery
- ▶ Much greater focus on plant reliability – supplier selection criteria



Conclusions



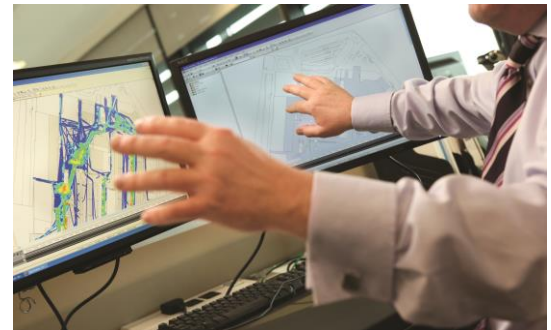
Conclusions

Regulatory environment provides a unique set of challenges and financial constraints

- ▶ Minimal shut down of services
- ▶ Financial penalties for late availability of access

However, this has:

- ▶ Improved discipline and performance
- ▶ Driven innovation
- ▶ Improved efficiency



Any Questions?

