

# *8th Florence Rail Forum*

*28 April, 2014*

***Rail Infrastructure and Rolling Stock:  
investments, asset renewal and regulation***

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# The biggest investment in more than a century

- To meet increasing demand we are investing in much needed capacity across the railway
- This is the biggest programme of investment in the railway since it was built by the Victorians – making up for decades of underinvestment
- There is now a political consensus in favour of investment in rail – and successive governments have found funding for this investment
- But we will need a further two to three decades of sustained strategic investment to address projected demand



# *Background: Network Rail*

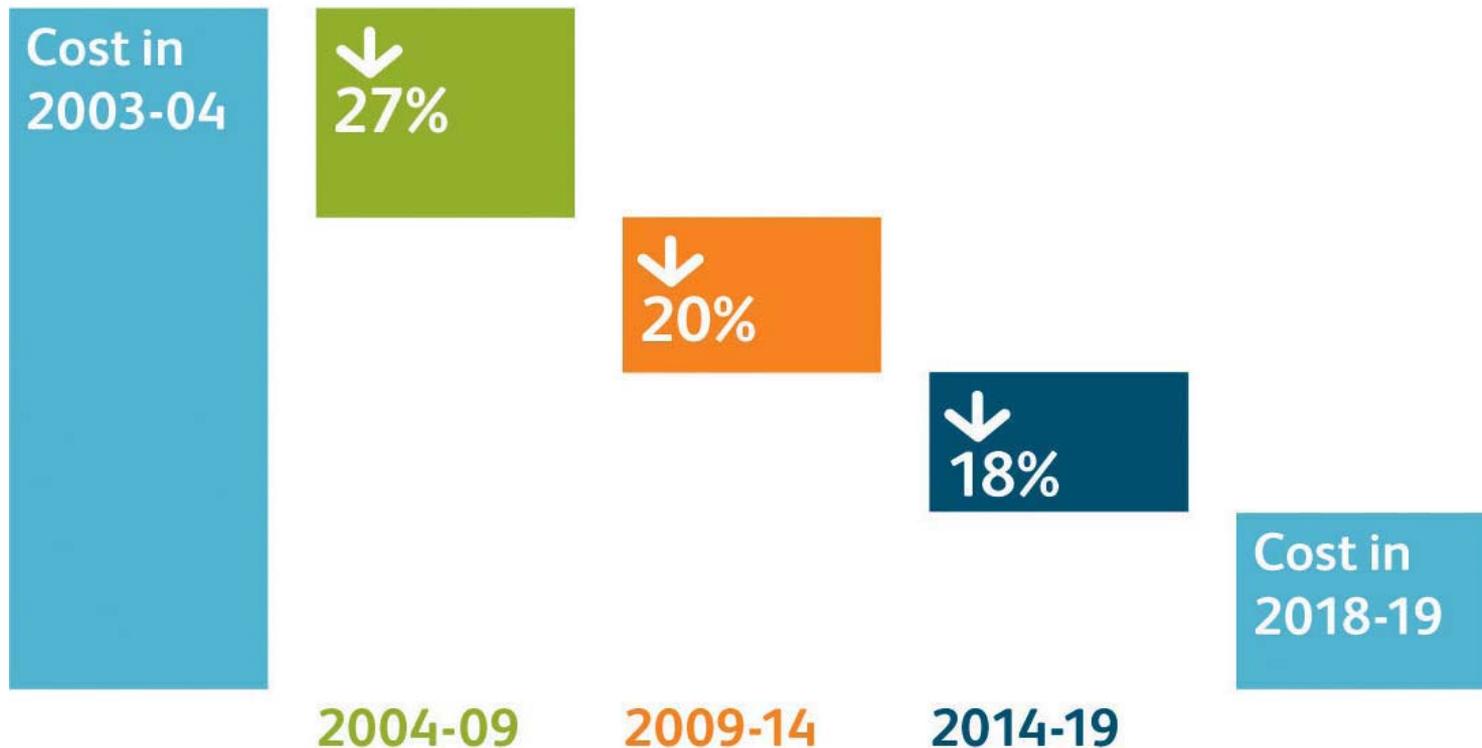
# What is Network Rail?

- Network Rail is one of the UK’s largest private landowners; its biggest purchaser of electricity; and owns its third largest telecoms network
- The company has 35,000 employees and 22 million neighbours (people who live or work within 500 metres of our infrastructure)
- We have an £11.5bn capital investment programme between 2009-14
- Under the 2005 Railways Act, we are also responsible for the long-term planning of the network



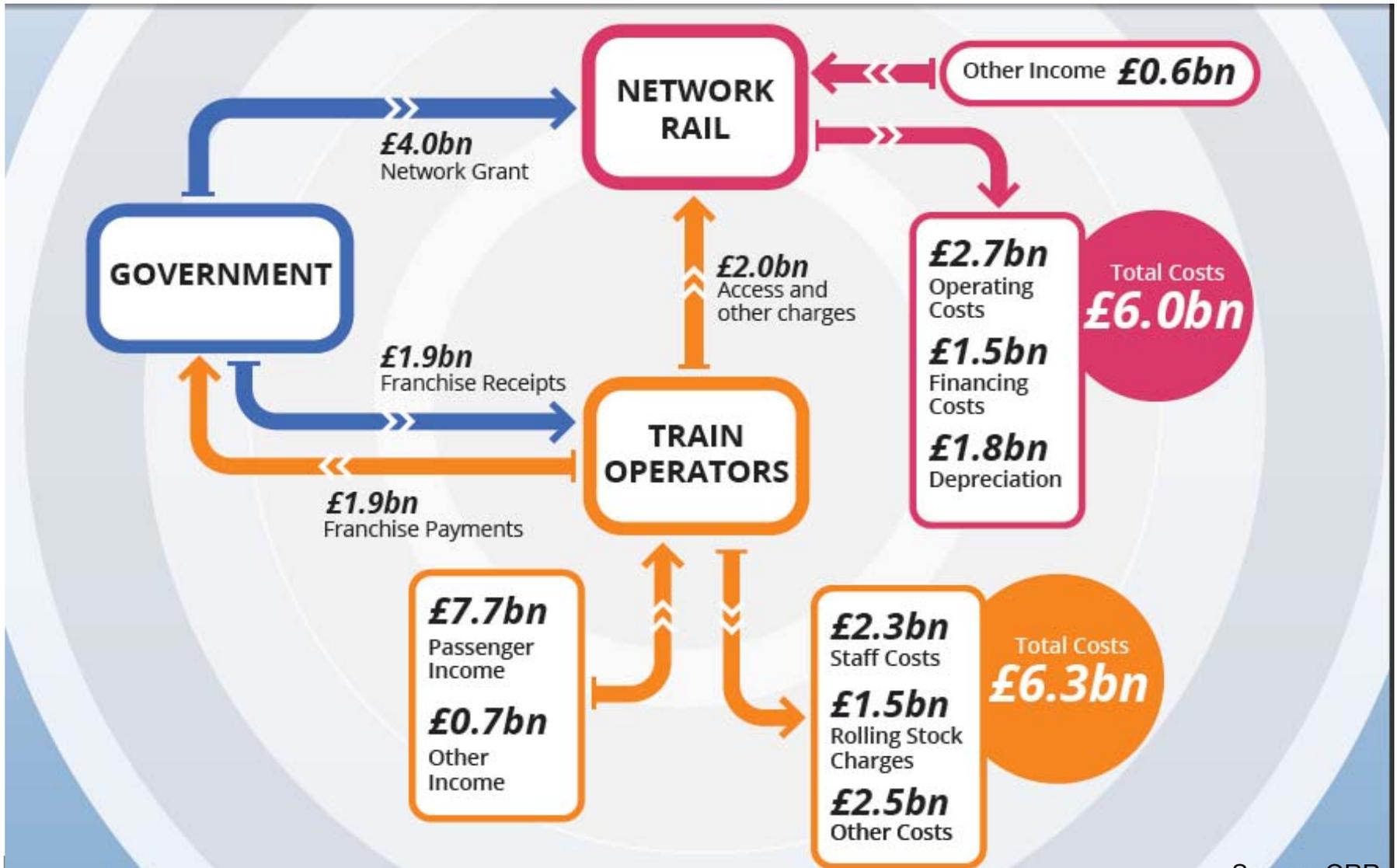
# We are reducing the cost of operating the railway

- Network Rail exists to give outstanding value to taxpayers and farepayers
- We are investing upfront to cut the day to day cost of operating, maintaining and renewing the railway



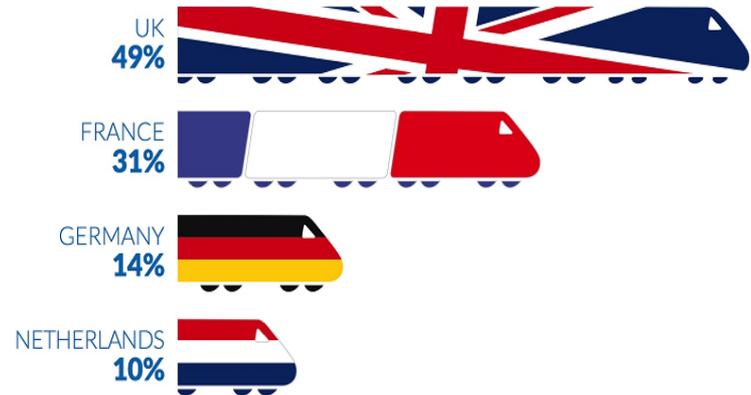
***Background:  
GB Rail***

# INDUSTRY INCOME, EXPENDITURE AND GOVERNMENT FUNDING APRIL 2012 - MARCH 2013



# We have seen extraordinary growth...

- We have Europe's fastest growing railway (1998-2010)
- In the last decade passenger numbers have gone up by 50%
- By 2020 forecasts suggest an extra 400m journeys – up to 1.8bn
- By 2031 passenger numbers in London are expected to grow by a further 36% on today

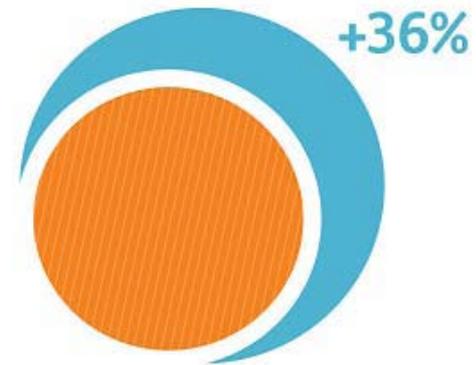


2002/03



2011/12

**Increase in passenger numbers between 2002/03 and 2011/12**



**Projected growth in demand in London by 2031**

## We are running many more trains...



- We are now running over 20% more trains than a decade ago
- This means more frequent services with more seats for passengers

## More passengers arrive on time...

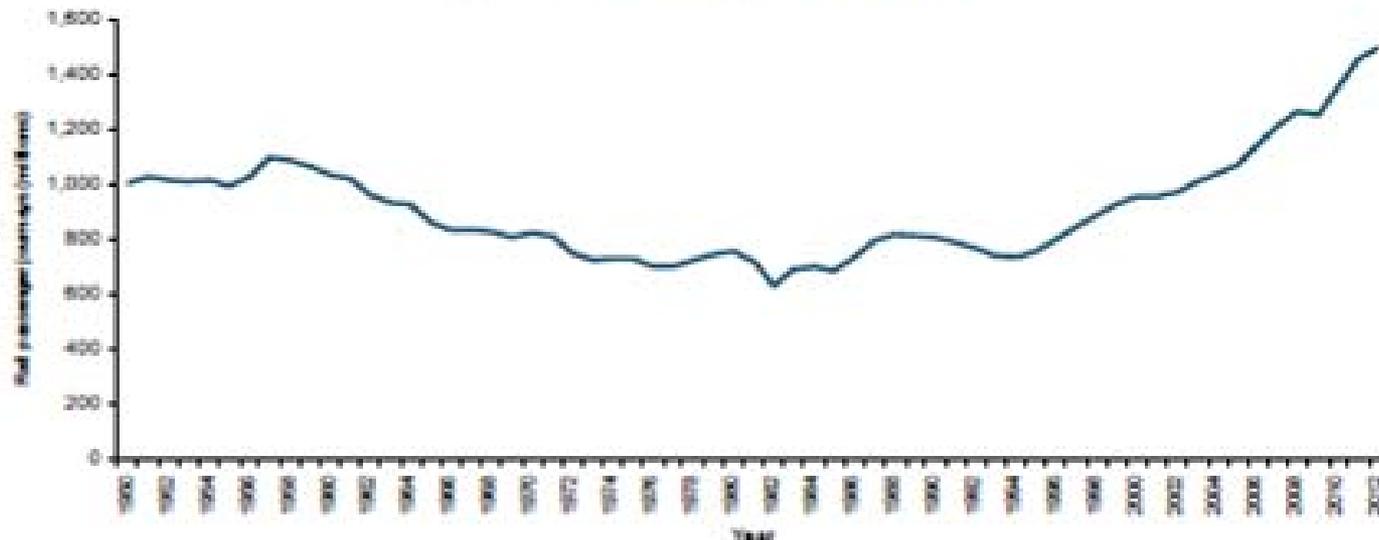


- 500 million more passengers now arrive at their destination on time compared to 2002/03 – when Network Rail took over Britain’s rail infrastructure

# Rail demand is at record levels

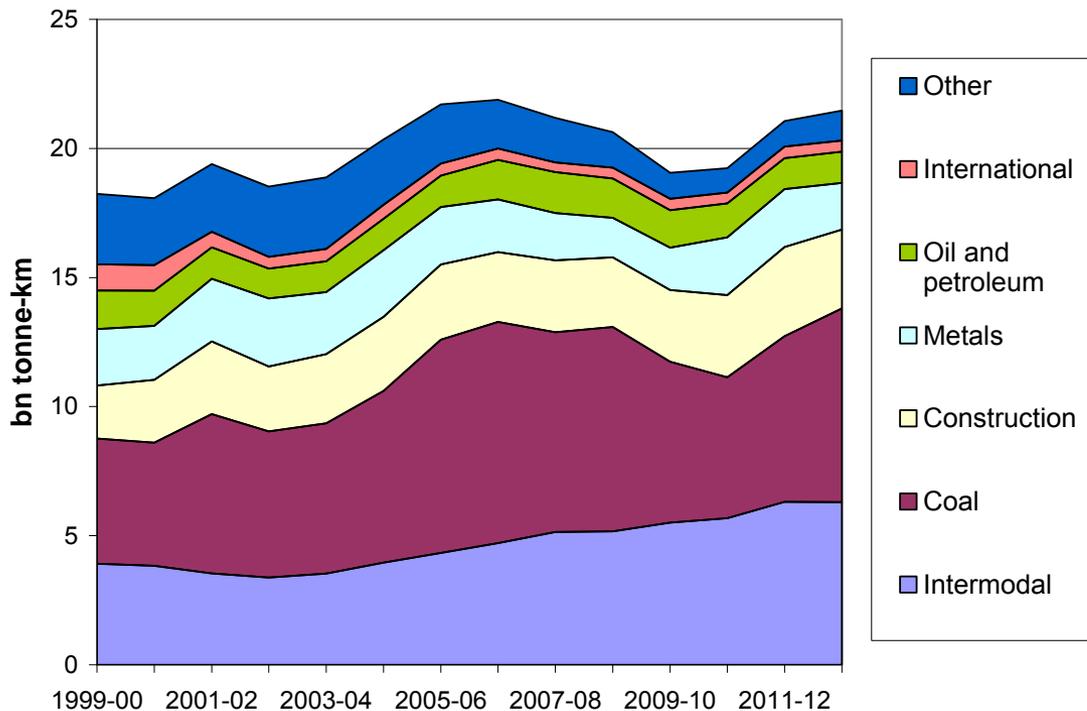
- Passenger markets have seen sustained growth since the mid 1990s. Demand has doubled from 735m to over 1.5bn journeys per year since 1995.
- Growth has been achieved in the context of a policy of allowing regulated rail fares to rise, on average, by 1% more than inflation over much of the last (economically challenging) decade.
- Passenger demand has been driven by population growth, city centre redevelopment, a re-urbanisation trend, development of a ‘knowledge based’ economy, and an improvement in rail’s competitive position.

Annual rail passenger journeys



# Freight growth has varied significantly by commodity

Rail freight moved by commodity



The volume of freight moved by the railways has increased by 15% over the last decade, despite softening during the recession.

In 2012/13 the railways moved over 21bn net tonne km of freight

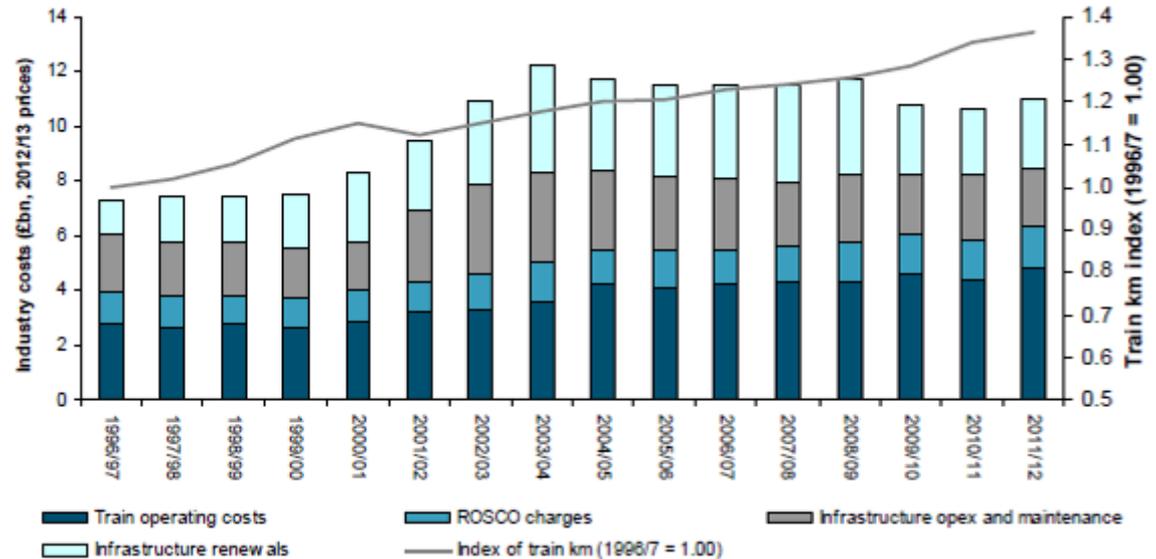
- **Intermodal:** growth in both overall market (imports from China etc.); and market share (efficiency improvements vs roads)
- **Coal:** driven by developments in the electricity supply industry: Prices of coal vs gas vs oil, & EU emissions directive
- **Construction:** favourable trends in demand & supply: Re-development of urban areas increasing demand  
Trend towards fewer, larger quarries
- **Other commodities** largely static or gradually declining

# Industry costs are coming down

Industry costs (excluding capital investment on enhancements) have fallen in real terms since 2003/4, despite a steady increase in the number of passenger train services

This has been achieved through efficiency-led reductions in expenditure on network operations, maintenance, and renewals

Train operators' costs have risen, in real terms, reflecting the additional train services being provided.

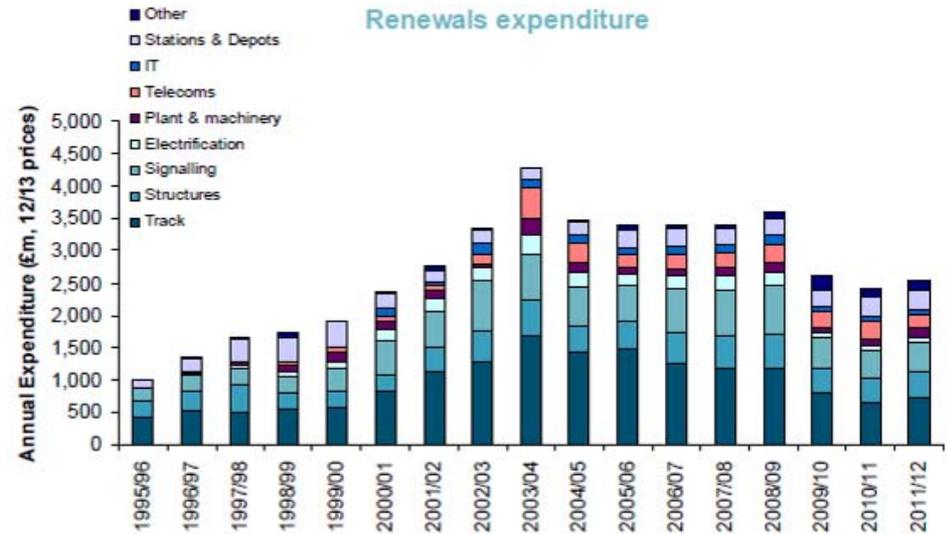


# There has been substantial investment to deal with renewals backlog

Since taking over the network in October 2002, Network Rail has tackled much of the backlog of renewals work left by Railtrack.

Important that investment is maintained at sustainable levels to avoid a repeat of the under-investment of the past.

There is also a need to place the management of structures (bridges, earthworks etc.) on a sustainable long term basis. They have lasted a long time with relatively modest maintenance, but this is not sustainable indefinitely .



# Government subsidy reducing

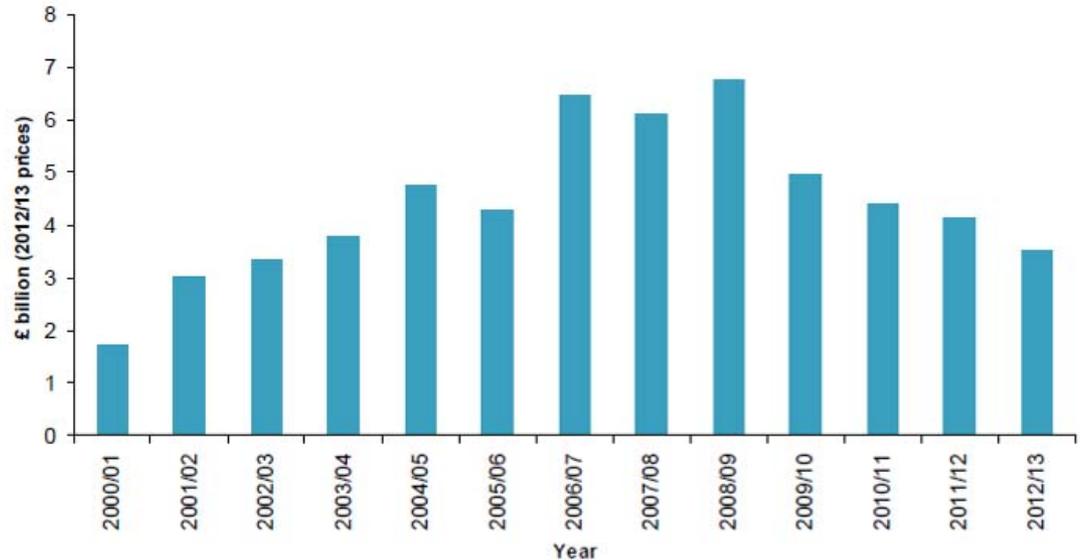
Subsidy is increasingly to pay for past investments.

Government support to Network Rail and Train Operating Companies peaked in 2008/9 at over £6bn (in 2012/13 prices).

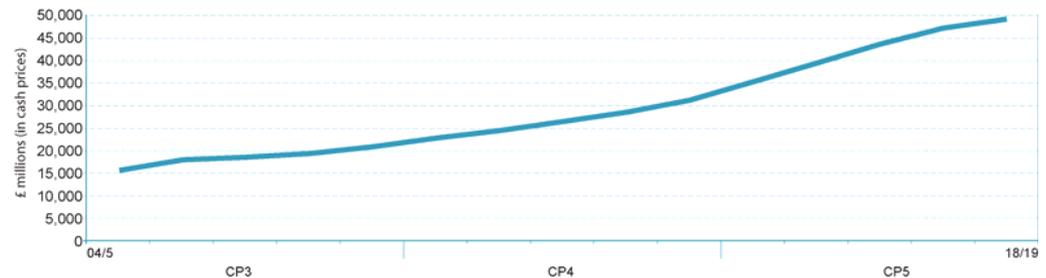
By 2012/13 Government support had been reduced to below £4bn.

The cost of financing Network Rail's debt has grown to £1.5bn per year.

Government Support to TOCs and Network Rail



Net debt



# *Establishing a long-term planning perspective*

# Mega projects more common as scope for incremental capacity reduces



- High Speed 2 (shown left)
- Crossrail (under construction)
- Crossrail 2 (potential option illustrated above)
- Brighton Main Line 2

# The Long Term Planning Process

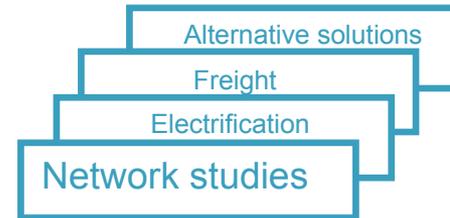
## Market studies

Forecast demand over a 10 and 30 year period for each market. A series of priorities or “conditional outputs” will be set – such as minimum frequency between cities – which will take into account stakeholder aspirations



## Network studies

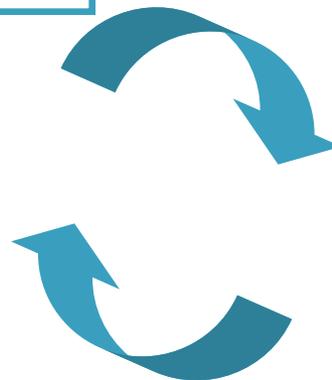
provide a framework for cross-network strategies such as electrification and freight strategies to be embedded into the route studies



## Cross Boundary Analysis

## Cross-boundary analysis

Consider options for services crossing multiple routes and provide consistent assumptions for the route studies



## Route studies

Develop options for all future train services, local as well as long distance, based on the demand forecasts and priorities set by the market studies. The options will reflect the different stakeholder priorities, such as accommodating freight and passenger growth or the impact of more services on performance



# What the market studies deliver



- Economic growth
  - Capacity
  - Connectivity
- Reduced environmental impact
  - Reduce use of less carbon efficient modes
- Quality of life
  - Connecting communities & access to social infrastructure
- Affordability & value for money

- Long distance
- Regional urban
- London & South East
- Freight

- Journey time between locations
- Passenger capacity
- Freight routing

Long Term Planning Process: Regional Urban Market Study



Long Term Planning Process: Long Distance Market Study



Long Term Planning Process: London and South East Market Study



Long Term Planning Process: Freight Market Study



# HS2

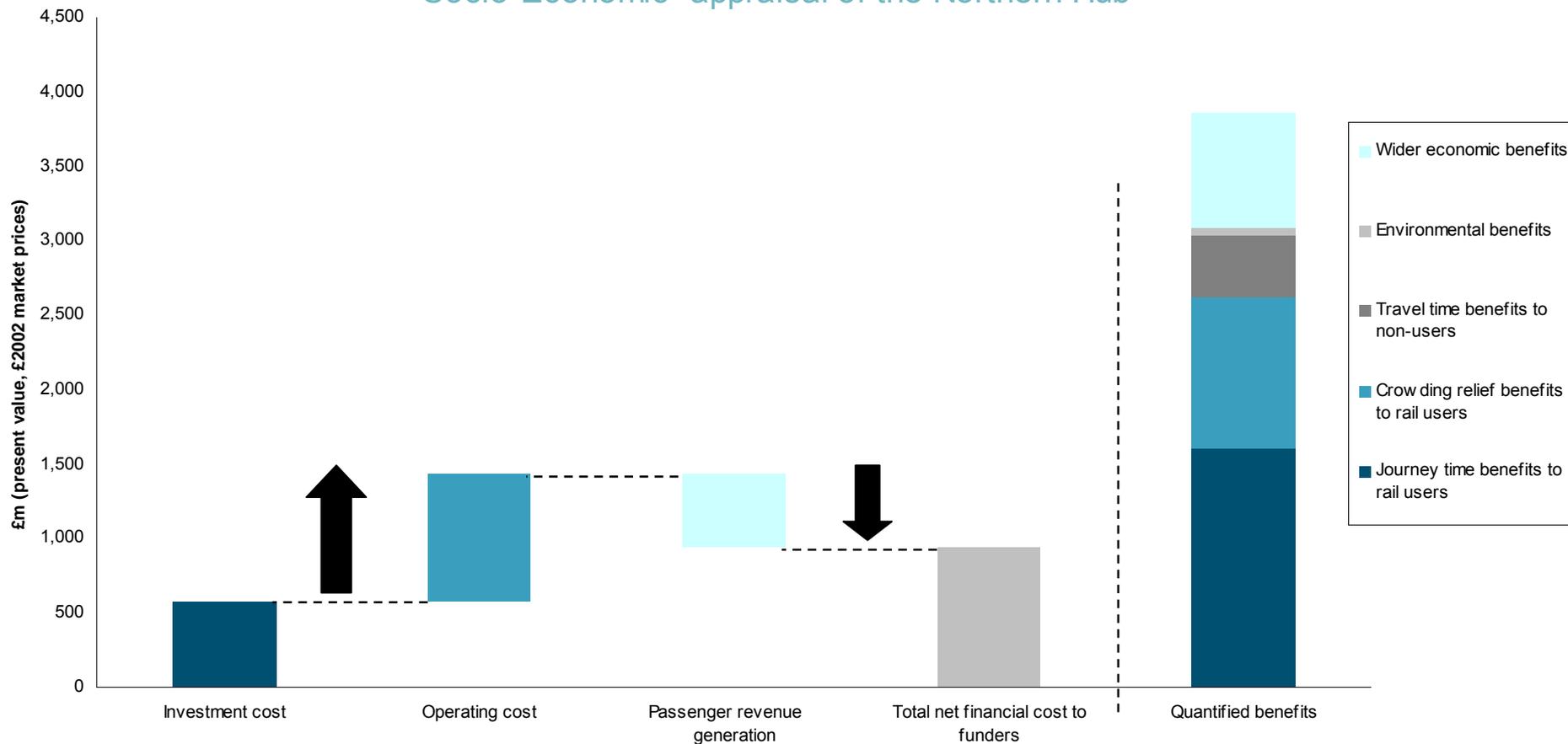
**Over the last decade the number of journeys made by rail has increased by almost 50%... By 2020 another 400 million rail journeys will be made every year.**

- ▶ HS2 provides an unparalleled opportunity to improve connectivity and increase capacity on Britain's railway.
- ▶ Network Rail does not see HS2 as a separate line, but rather as part of a reshaped national network.
- ▶ We are advising HS2 Ltd and the Department for Transport on the effective integration of HS2 with the national rail network.
- ▶ We want to make the best use of the combined capacity on new and existing lines and to keep as many trains running as possible during construction.

# *Securing investment*

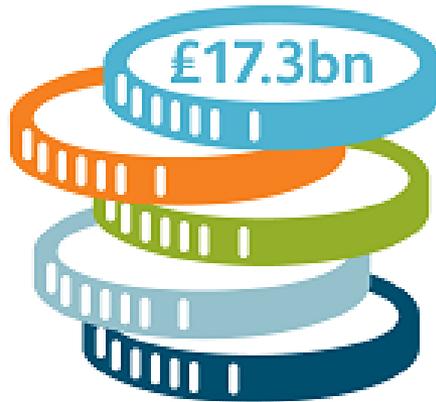
# Investment can bring substantial benefits

"Socio-Economic" appraisal of the Northern Hub

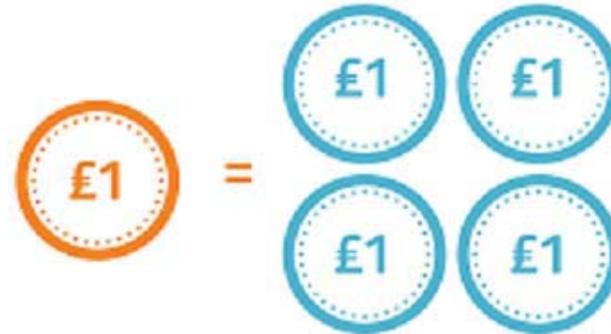


# The railway is vital to the economy...

- In Britain, 1.46 billion journeys are made by train every year and the railway transports 100 million tonnes of goods.
- Investing in rail brings jobs to the supply chain and benefits to the wider economy

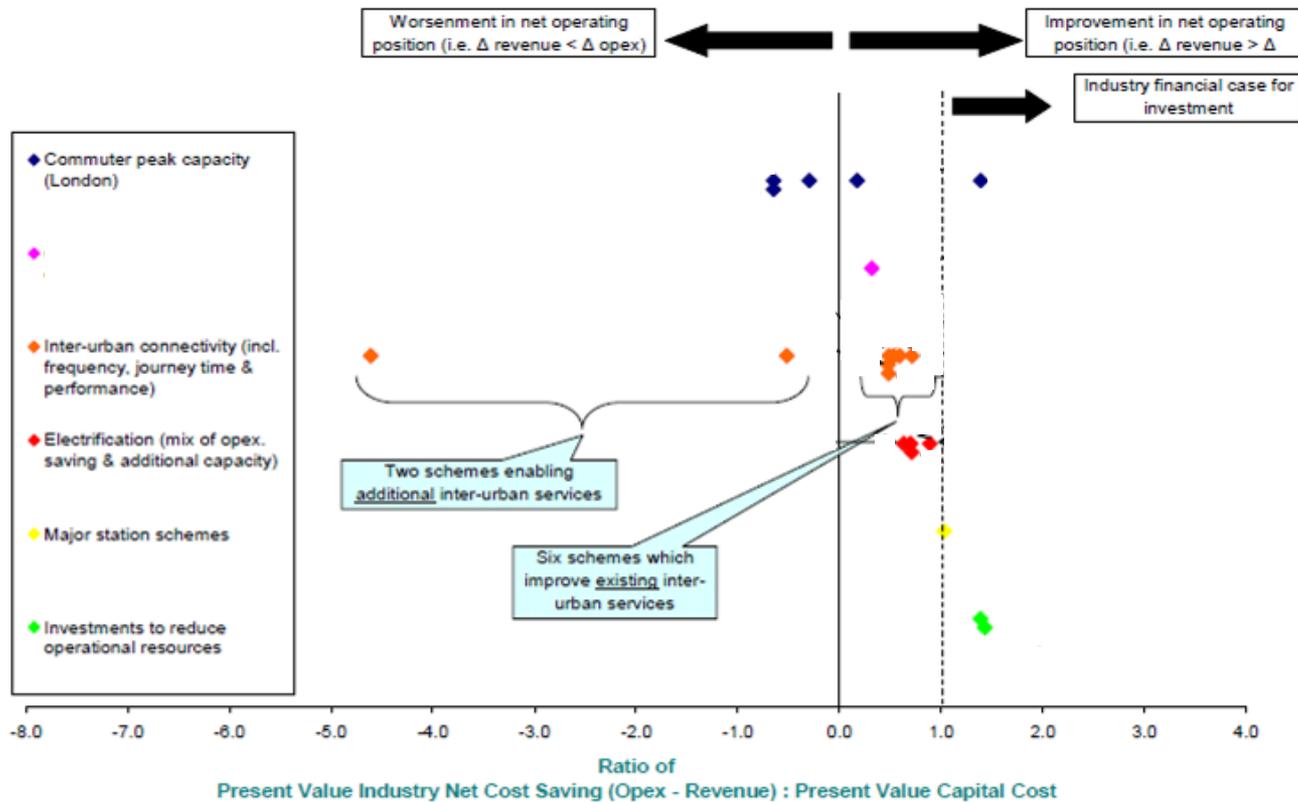


**We have generated £17.3bn of work for our supply chain since 2009**



**Our Northern Hub project will generate £4 in economic benefits for every £1 spent**

# Relatively few rail investments are available on a purely commercial basis



In industry economic terms there are three key 'groups' of enhancement project:

Projects which worsen the net operating position of the railway. I.e. investments in capacity or connectivity that will generate a requirement for additional future subsidies to operate the associated train services, over and above the initial capital investment

Those resulting in an improvement in the railway's net operating position, but insufficient to cover the capital costs of the initial investment

And those with a clear financial business case.

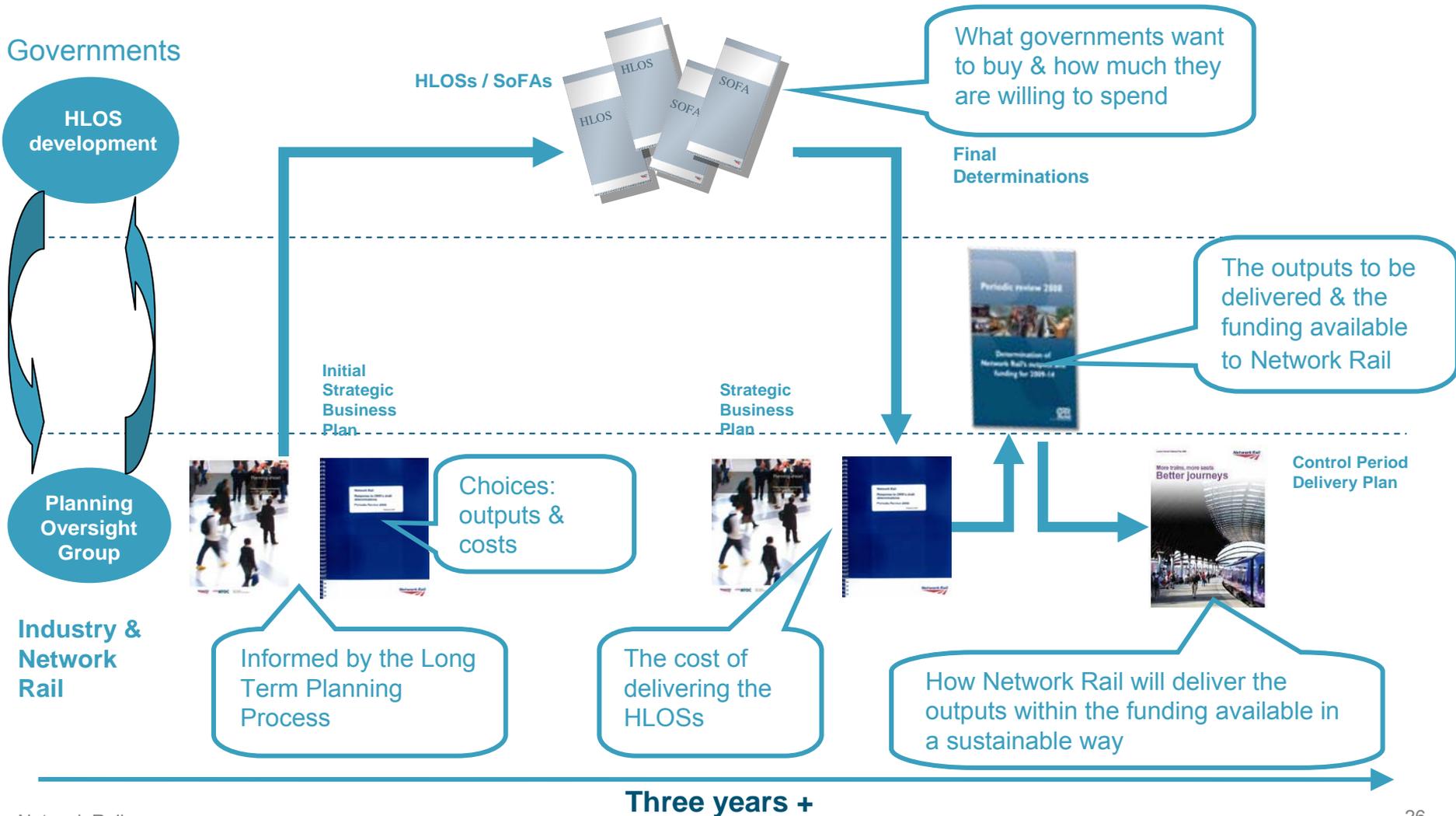
Increasingly transparent funding arrangements should make the affordability of different services clearer. This can be expected to lead to pressures for a more disaggregated funding and subsidy – and a potential growth of investment at local level.

# What are we asking for investment in?

<b>Capacity</b>	Accommodating continuing growth in demand on existing services
<b>Connectivity</b>	Providing new, faster or more frequent services, particularly into and between city centres
<b>Freight capability</b>	Removing network constraints to enable more, longer and bigger freight trains.
<b>Electrification</b>	Converting services to electric operation reduces rolling stock leasing and operating costs, reduces journey times, reduces emissions, and can increase train capacity.
<b>Stations</b>	Increasing capacity to handle more trains and more people. Also increasing investment in stations in conjunction with development of surrounding areas and as gateways to cities.

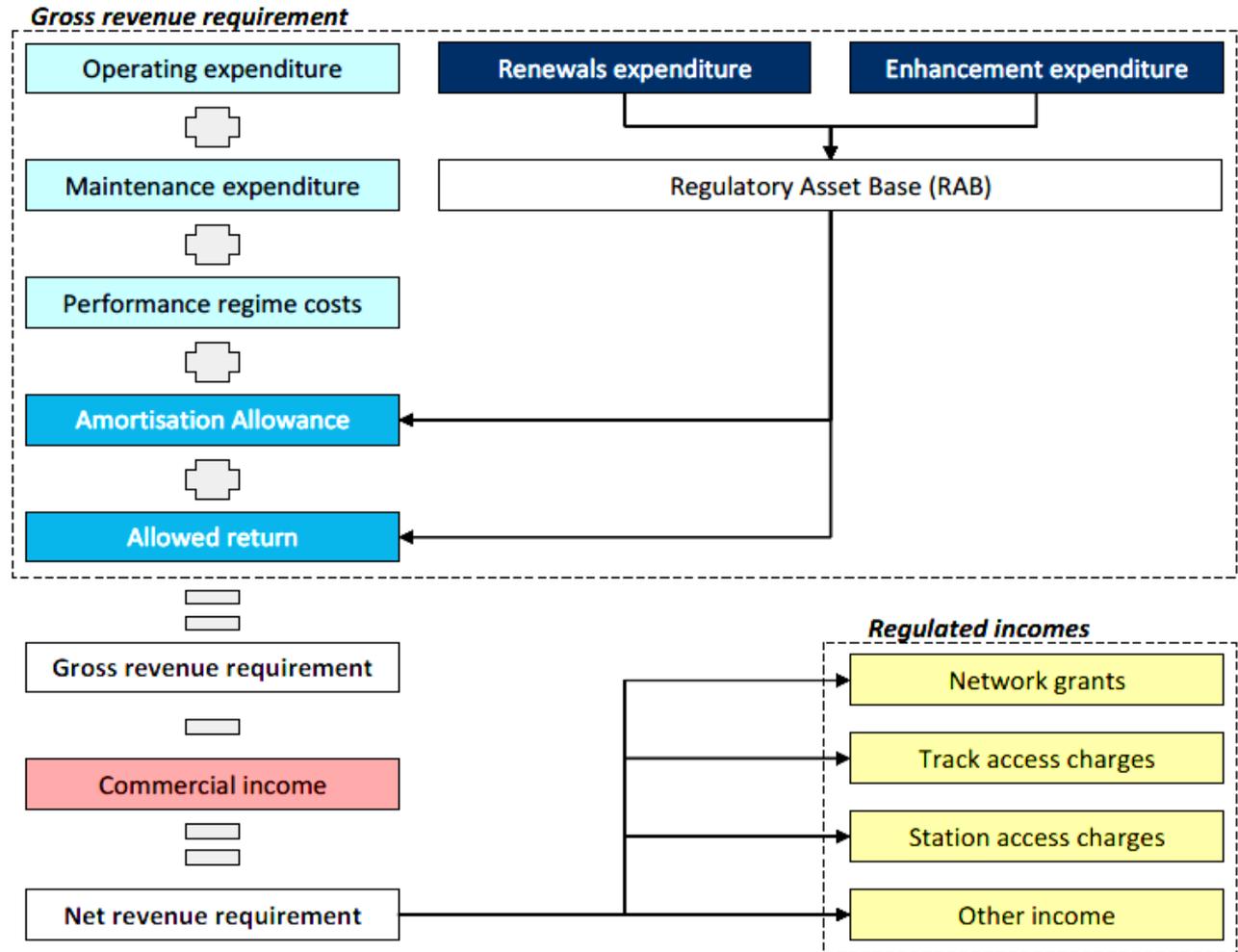
# *Multi-Annual Contracts*

# The periodic review (MAC) process is key to securing the funding for our long term strategies



# How is revenue set?

- The building block approach is the standard method of regulation for this type of company
- This funding approach spreads the cost of new (or replacement) infrastructure to users of that infrastructure over its useful economic life
- The ORR determines our revenue requirement on the basis of a set of physical outputs (e.g. network size, capability, condition, performance) specified by government
- Income is uplifted by RPI each year



# High level summary of the Final Determination

- **Network Rail has accepted (March 2014):**
  - Circa £38bn expenditure
  - Improved safety & performance
  - Enhanced capacity & capability
  - Improvements in asset management

<b>Expenditure</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>CP5 total</b>
Support	9.0%	4.9%	6.2%	3.3%	4.3%	24.9%
Operations	1.9%	2.9%	4.3%	4.2%	5.4%	17.4%
Maintenance	3.7%	3.3%	3.5%	3.5%	3.6%	16.4%
Renewals	8.4%	3.6%	3.8%	2.7%	3.2%	20.0%
<b>Weighted average efficiency</b>	<b>6.8%</b>	<b>3.6%</b>	<b>4.0%</b>	<b>3.1%</b>	<b>3.6%</b>	<b>19.4%</b>

# A significant part of the CP5 Enhancements Plan was specified in the HLOS



Projects ‘specified’ by the England & Wales HLOS include:

- Delivery of all remaining elements of the Northern Hub (shown left)
- East West Rail
- Reading station area redevelopment
- Stafford area improvement scheme
- The Intercity Express Programme
- Elements of the “Electric Spine”,
- Oxford station area capacity and enlargement
- Western access to London Heathrow Airport
- Service improvements in the Ely area
- London Waterloo enhancement
- Huddersfield station capacity improvement
- Redhill additional platform

Projects ‘specified’ by Scottish Ministers include:

- Aberdeen to Inverness journey time improvements and other enhancements
- Highland main line journey time improvements
- Motherwell area re-signalling enhancements and stabling

“Rollover” enhancement projects in England & Wales include:

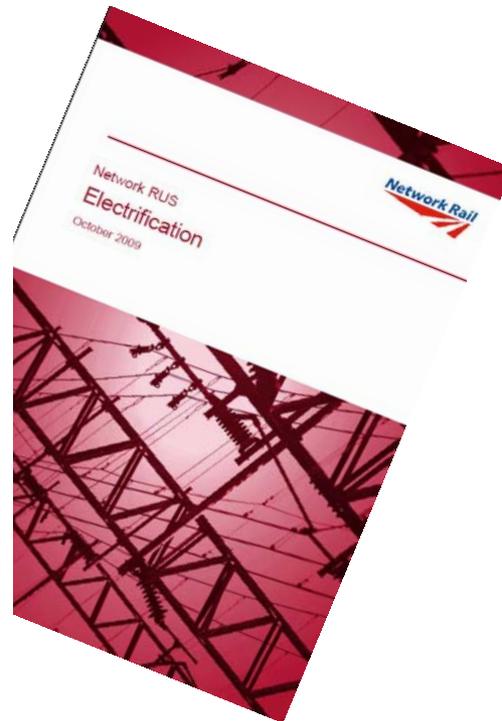
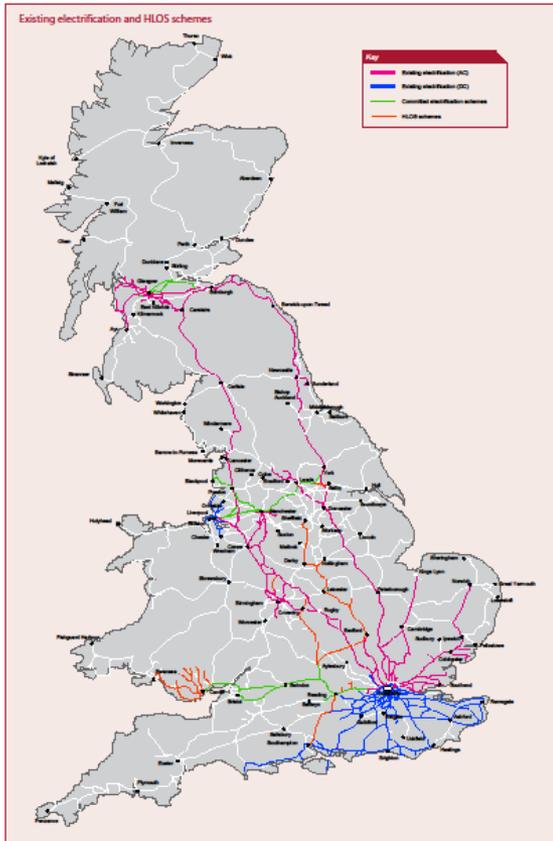
- Birmingham New Street Gateway (shown right)
- Thameslink programme
- Crossrail (“on network works”)
- Bromsgrove electrification
- Redditch branch enhancement
- Kent power supply upgrade (CP4 component)
- Barry to Cardiff Queen Street corridor
- Northern Urban Centres (including Liverpool to Leeds journey time improvements)
- West Coast power supply upgrade
- Completion of certain ‘7-day railway’ initiatives

“Rollover” enhancement projects in Scotland include:

- Edinburgh Glasgow Improvements Programme
- Borders Railway



# A rolling programme of electrification



Priorities for further network electrification were informed by Network Rail's 2009 Network RUS: Electrification strategy.

Control Period 5 electrification projects in England & Wales include:

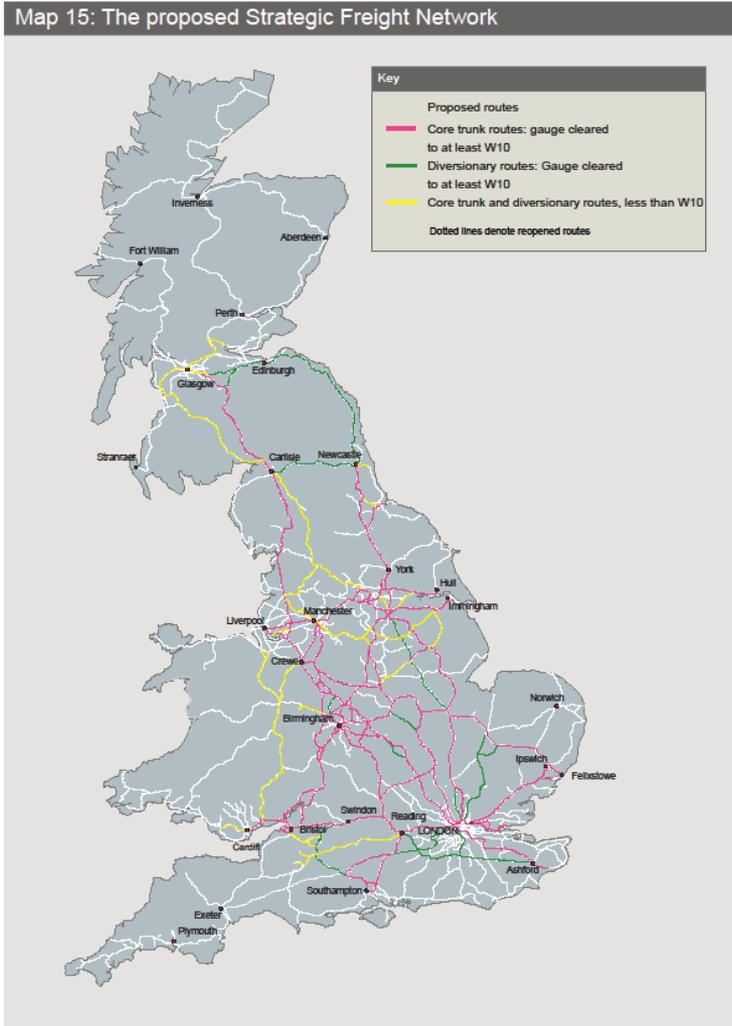
- Great Western electrification, from Maidenhead to Bristol, Cardiff, Newbury & Oxford, plus Cardiff to Bridgend in Wales
- Bridgend to Swansea electrification
- North Trans-Pennine electrification, and Micklefield to Selby
- North West electrification (Manchester to Liverpool via the Chat Moss route, Huyton to Wigan, Manchester to Euxton Junction, and Preston to Blackpool North)
- The "Electric Spine", including electrification of the Midland main line between Bedford and Nottingham, Derby and Sheffield
- Acton to Willesden (West Coast main line) electrification
- Thames Valley branches
- Walsall to Rugeley electrification
- Electrification of the Welsh Valley lines

Since publication of the HLOSs, funders have committed to electrification of the route between Gospel Oak and Barking.

Scottish electrification schemes include:

- Edinburgh Glasgow Improvements Programme (EGIP) electrification
- A capability to implement a rolling programme of electrification in Scotland to cover around 100 single track kilometres per year (post-EGIP)

# The HLOSs included ring-fenced funds to continue investing in the Strategic Freight Network (SFN)



- The HLOS for England & Wales included a Strategic Rail Freight Network fund of £246m, including an element of rollover from Control Period 4. The Scottish Ministers’ HLOS included a Scottish Strategic Rail Freight Investment fund capped at £31m
- These industry held funds are governed by the Strategic Freight Network Steering Group, which includes representatives from Network Rail, freight operating companies, ATOC, the Rail Freight Group, the Freight Transport Association, and local and national funders
- It is anticipated that the funds will be used to continue existing investment programmes (for example, Felixstowe to Nuneaton – “F2N”), and to deliver further projects which industry has been developing for Control Period 5 delivery
- Typically, SFN funds are used to deliver gauge clearance, freight train lengthening and freight capacity projects
- The total capital investment benefitting rail freight over Control Period 5 will not be limited to projects funded through the ring-fenced funds; other schemes ‘specified’ in the HLOSs (most obviously the Electric Spine and East West Rail) will deliver benefits to both passenger and freight services

# The rail industry has developed a strategy to deliver the capacity specified by the HLOS for England and Wales

The strategy for Control Period 5 was informed by long-term planning in Network Rail's Route Utilisation Strategies (RUSs)



The passenger capacity plan was developed by Network Rail, the train operating companies (TOCs), and other industry partners working closely together.

The plan therefore reflects both longer term strategies (established through industry's Control Period 5 planning processes), and shorter term franchise commitments.

To promote economic efficiency and value for money, industry's plan reflects the following broad 'hierarchy' of capacity strategies:

- First, by taking account of existing spare capacity during peak hours, as well as any capacity which will be delivered by existing commitments
- Next, by seeking to deliver extra capacity through the reallocation of existing resources ('making best use')
- Then, by delivering additional capacity within the current capability of the network, by deploying extra operational resources to deliver more and / or longer trains
- Finally, enabling the operation of new and / or longer services by investing in the capability of the network

In Scotland, additional passenger capacity will be provided over Control Period 5 by delivering projects specified by Scottish Ministers.

# 2009 – 2014 MAC

## CP4 OUTPUTS what we need to deliver

**FUNDING**  
SECURED

WE NEED TO MAKE  
**EFFICIENCIES**  
IN ORDER TO ACHIEVE  
SAVINGS OF **21%** ON TOP  
OF THE 27% MADE  
SINCE 2003

<b>SAFETY</b> The reduction in safety risk	▼	Reduce by 3%
<b>PERFORMANCE</b> PPM	▲	Increase to 92.6%
Service cancellations / significant delays	▼	Reduce by 15-23%
Delay minutes (passengers)	▼	Reduce by 23%
(freight)	▼	Reduce by 25%
<b>CAPABILITY</b> Line speed, gauge	➤	Maintain at April '09 levels
<b>CAPACITY</b> e.g. Thameslink, Reading projects		Deliver as defined by delivery plan
<b>STATION CONDITION</b>	➤	Maintain for each category
<b>AVAILABILITY</b> (passengers)	▲	Increase by 37%
Keeping the railway open when people want to use it (freight)	➤	No decrease
<b>ASSET STEWARDSHIP</b> Achieving our required outputs in a sustainable way		
<b>CUSTOMER SATISFACTION</b> How we will measure our success		

ORR determines what Network Rail must achieve within a Control Period, the funds required to do this and the incentives needed to encourage outperformance. Network Rail's job is to deliver the specified outputs; within the funds available, safely and sustainably, and as efficiently as possible.

# *Issues and considerations*

# Regulated outputs and indicators

- As well as access regulation and licence requirements;

Area	Regulated outputs
Train service reliability	<p>PPM for England and Wales (annual targets and CP5 exit of 92.5%), Scotland (annual 92% target and CP5 exit of 92.5%) and franchised TOCs in England and Wales (rolling annual target and no TOC to exit CP5 below 90%, except East Coast and Virgin who must not exit CP5 with PPM below 88% or CaSL above 4.2% and 2.9% respectively, and 88% for First Great Western High Speed services at the end of CP5)</p> <p>CaSL for England &amp; Wales (annual and CP5 exit of 2.2%) and rolling annual output JPIP</p> <p>Freight Delivery Metric (National annual 92.5% target)</p>
Enhancements	<p>Enhancement projects to be delivered. Scheme delivery milestones (set in an enhancements delivery plan)</p> <p>Milestones for delivery of projects in ring-fenced funds.</p> <p>Development milestones for early stage projects</p>
Health & safety	<p>Network Rail is required to deliver a plan to maximise the reduction in risk of accidents at level crossings using £99m ring-fenced fund.</p> <p>Ring fenced fund of £10m to facilitate closure of level crossings in Scotland</p>
Network availability	<p>PDI-P (National CP5 exit of 0.58)</p> <p>PDI-F (National CP5 exit of 0.73)</p>
Network capability	<p>Base requirement at start of CP5 in terms of track mileage and layout, line speed, gauge, route availability, electrification type</p>
Stations	<p>Station Stewardship Measure (SSM) by station category, and Scotland (annual)</p>
Asset management	<p>Asset management excellence model (AMEM) capability for each core group at National level</p> <p>Asset data quality for each asset type at National level</p> <p>Milestones for ORBIS (Offering Rail Better Information Services)</p>

Area	Indicator	Enablers
Train service reliability	<p>PPM: sector and sub-operator</p> <p>Right-time performance: England &amp; Wales, Scotland, sector, JPIP and sub-operator</p> <p>Average lateness: England &amp; Wales, Scotland, sector and JPIP</p> <p>CaSL: sector and sub-operator</p> <p>Delay minutes, split by category (including Network Rail on TOC, TOC on self and TOC on TOC): for National, England &amp; Wales, Scotland, sector, Network Rail route and JPIP</p> <p>FDM by strategic freight corridor</p> <p>Freight delay minutes (national)</p> <p>Scotland KPI package</p>	<p>Safety management maturity (Railway Management Maturity Model – RM3)</p>
Enhancements	<p>Enhancement fund KPIs (e.g. average scheme benefit cost ratios)</p> <p>Improved governance processes for HLOS funds</p> <p>Project activities and milestones</p>	<p>System operator capability</p>
Depots	<p>Light Maintenance Depot Stewardship Measure: England &amp; Wales, Scotland and National</p>	<p>Programme management capability (P3M3)</p>
Asset Management	<p>Asset condition for robustness and sustainability at National and route level</p> <p>AMEM <del>lta</del> capability at route level</p> <p>Renewal and maintenance volumes by asset type and spend at National and route level</p>	<p>Customer service maturity</p>
Environment	<p>Scope 1 and 2 traction and non-traction carbon dioxide emissions: England &amp; Wales and Scotland</p> <p>Carbon embedded in new infrastructure</p> <p>Sustainable development KPIs</p>	
Other	<p>Passenger satisfaction</p> <p>Journey time</p> <p>Cross-border service availability</p>	

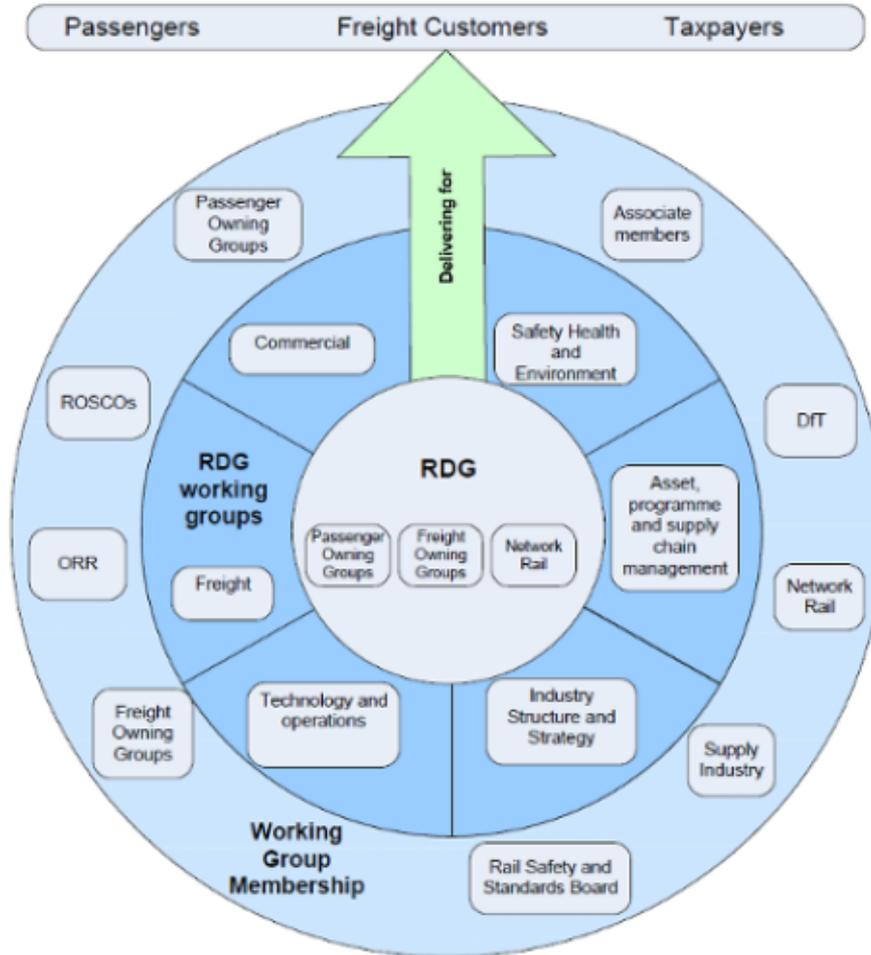
# Principles for regulation

- **Safety** – Network Rail should be supported and encouraged to deliver continuous improvements in public, passenger and workforce health and safety
- **Output based incentive regulation** – Network Rail should be effectively incentivised to deliver and outperform achievable output and efficiency targets
- **Simplicity and risk based approach** – The regulatory and contractual regime should be simple and targeted using a consistent risk-based approach
- **Partnership** – Network Rail and its customers/suppliers should be empowered to enter into various forms of partnerships or alliancing arrangements which will improve value for money without undermining network benefits or scale efficiencies
- **Whole-life, whole-system, risk-based optimisation** – The level of funding, the required outputs and the financial framework should enable Network Rail to manage risk and make whole-life, whole-system decisions
- **Corporate development** – The regulatory regime should encourage but not predetermine the evolution of the business to facilitate improved value for money, for example through competition and risk capital.

# Sustainability

- Long term financial sustainability means that we do not increase debt unnecessarily.
- Our focus is on:
  - **Continuous improvement**
  - **Whole life costs**
  - **Whole system costs**
  - **Excellence in asset management**
  - **Technology strategy**
- The regulatory framework is complicated and burdensome, and ultimately could lead to us being less efficient (3,000+ measures under regulatory scrutiny).
- Good regulatory principles require a pragmatic approach to the interpretation of variances, i.e. there will be changes to our forecasts. Regulatory framework should be simple and enable our people to deliver the required improvements in partnership with our customers and suppliers

# We need to plan collaboratively across the industry



- The success of the Long Term Planning Process depends on the engagement and support of operators and funders
- Customer engaged through Rail Industry Planning Group, which includes operators, funders & other stakeholders (e.g. Rail Freight Group)
- Reflects requirements set out in 1<sup>st</sup> Package recast.

# Funding & Affordability

Our aim is to create a financially sustainable railway.

At present, the majority of the funding for rail comes from a combination of fares and taxes.

In recent years, successive governments have made the decision to balance more of that funding towards passengers, users of the railway.

We are keen to explore longer term funding models

## 2019 Outcomes

- Delivered CP5 outputs sustainably and efficiently and plans in place for CP6.
- Route-based CP6 output and expenditure plans as part of longer term strategy for the network that reflects whole-life optimal approach with clarity about choices and trade-offs.
- Benchmarking demonstrates relative efficiency.
- A sustainable funding and financing strategy including clarity on the approach to funding legacy costs and future investment.
- Mechanisms for raising third party capital developed.

## Longer term outcomes

- Benchmarking demonstrates relative efficiency.
- Independent finance raised within the Group.
- The railway generates funds for further investment.