L.E.K.

frontier economics

Rail VfM

Alternative Railway Structures: Final Report – Volume 3

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Although this report was commissioned jointly by the Department for Transport (DfT) and the Office of Rail Regulation (ORR), the findings and recommendations are those of the authors and do not necessarily represent the views of the DfT and the ORR. While the DfT and the ORR have made all reasonable efforts to ensure the information in this document is accurate, the DfT and the ORR do not guarantee the accuracy, completeness or usefulness of that information; and cannot accept liability for any loss or damages of any kind resulting from reliance on the information or guidance this document contains.

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Due to the DfT/ORR's web-site constraints, the on-line version of this report has been split into three separate volumes

- Executive summary
- Introduction
- Horizontal separation

Volume 1

- Vertical integration
- Vertical alignment
- Cost and revenue sharing
- Implementation

Volume 2

- Appendix

Volume 3

Agenda

- Executive summary
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  - Stakeholder consultation programme and documents reviewed
  - Financial baseline and option impact quantification
  - Regional case studies
  - Review of existing arrangements

L.E.K. has carried out an extensive programme of stakeholder consultation to understand the views of industry participants

Meeting type	Stakeholders		
	Already met		
Workshop	1st industry workshop: NR, Abellio, Arriva, ATOC, DB Schenker, Freightliner, Go Ahead, Serco, Stagecoach, Virgin Trains 2nd industry workshop: NR, ATOC, Arriva, DB Schenker, First Group, Freightliner, Go Ahead, KS Consultants, Serco, Stagecoach Rail Case study workshops: LNE and Chiltern		
GB operator consultation	• Virgin Trains • DB / Stagecoach • Rail Freight Group • Freightliner • DB Schenker • Serco • Veolia Transport	• Stagecoach • National Express • MTR • Grand Central • First Group • Danish State Railways	• ATOC • Carillion / First Group • Arriva • Go Ahead • Abellio • Keolis
NR	• Bill Davidson • Jonny Allen • Calvin Lloyd • Andrew Newby	• Catherine Doran • Peter Swattridge • Paul Plummer • Ian Ballentine	
Other	• ORR • DfT • TfL	• PTEG • Railfreight Group • Andrew McNaughton	

L.E.K. has also reviewed a large number of relevant reports and other documents (1 of 3)

UK rail

Network Rail

- Route Plans (various); 2008 & 2010
- CP4 Delivery Plan (various); 2009 & 2010
- Regional RUSs (various); 2008-2010
- Strategic Business Plan – CP4 (various); 2007 & 2008
- Route AMP – Doncaster-Peterborough, RACI; 2009 & 2010
- Network Rail Transformation Programme; 2010
- Organisation Restructure – Network Rail; 2009
- MIP and General Bonus Scheme – Overviews; 2008-11
- Operating Strategy Overview; 2010
- Industry Costs & Income – NR Operating Routes; 2010
- Asset Management Strategy; 2010
- Engineering Strategy; 2010
- Asset Management Policies; 2010
- Overview of Maintenance Activities; 2010

For the Rail Value for Money Study

- Review of Rail Cross-industry Interfaces, Incentives, and Structures; Arup/Oxera; 2010
- Effectiveness and efficiency of asset management and supply chain management in the GB rail industry; Atkins; 2010
- Whole System Programme Management; Atkins; 2010
- Reviewing the Franchise Map; Jacobs; 2010
- Research Project on Unit Costs and Franchising; PwC/Interfleet/Colin Buchanan; 2010
- Achieving VfM from a Railway System Authority; Risk Solutions / SDG; 2010
- Leadership, Planning and Decision Making; SDG; 2010

ORR

- Annual efficiency and finance assessment of Network Rail; 2008-10
- National Rail Trends Yearbook 2009-10; 2010
- Periodic Review 2008; 2008

Other

- Better Alignment of Train and Track; ATOC; 2010
- High Level Review of Track Access Charges and Options for CP5; CEPA; 2010
- InterCity East Coast Franchise; KPMG; 2004
- Passenger rail strategic objectives; STAR; 2010
- Rail VfM Study – PTEG Response; PTEG; 2010
- 2009 Best Practice Review [Asset Management]; AMCL; 2009
- Merseyrail – Outline Business Case; Merseytravel; 2006 & 2010
- Aims, Models and Powers of Rail Regulators; Trasse Schweiz; 2010
- Planning Ahead (various); Planning and Oversight Group; 2009 & 2010
- Privatizing British Railways: Are There Lessons for the World Bank and its Borrowers?; Louis S Thompson; 2004
- British Rail 1974-1997; Gourvish; 2002
- Britain's Railways 1997-2005 – Labour's Strategic Experiment; Gourvish; 2008
- National Rail website

L.E.K. has also reviewed a large number of relevant reports and other documents (2 of 3)

Global rail

US

- Overview of America's Freight Railroads; AAR; 2008
- The Staggers Act: Balanced Regulation That Works; AAR; 2010
- US Railroad Efficiency: A Brief Economic Overview; Gerard McCullough; 2007

Australia

- Franchising Melbourne's Train and Tram System; Auditor General Victoria; 2005
- A Review of Melbourne's Rail Franchising Reforms; Currie; 2009
- Refranchising Melbourne's Metropolitan Train and Tram Networks; Deloitte; 2007
- Victoria's public transport - Assessing the results of privatisation; Institute of Public Affairs; 2007
- The Reliability of Melbourne's Trains 1993-2007; Urban Planning Programme; 2007

International

- Guidelines for the Application of Asset Management in Railway Infrastructure Organisations; UIC; 2010

Non-rail

Gas

- Productivity Improvements in Distribution Network Operators; CEPA; 2003
- The Break-Up of National Grid's Gas Distribution Business; First Economics; 2010
- Sale of Gas Networks by National Grid; NAO; 2006
- Potential Sale of Gas Distribution Network Businesses – Final Impact Assessment; Ofgem; 2004
- Gas Distribution Price Control Review; Ofgem; 2006 & 2007

Water

- Future water and sewerage charges 2010-15: Final Determinations; Ofwat; 2009

Electricity

- Electricity Distribution Price Control Review – Allowed Revenue – Cost Assessment Appendix; Ofgem; 2009

Other

- Review of Q5 Airport Price Control Processes – Lessons for Q6; Davison Yarrow; 2010
- Estimating and monitoring the costs of building roads in England; NAO; 2007
- Collaborative Advantage: The Art of Alliances; Kanter; 1994

Statistics

- Network Rail internal data, including
  - managed station P&Ls
  - Chiltern infrastructure cost model
- UIC – Railisa Database
- CIA World Factbook

Other

- Company accounts
- Trade press
- Example contracts – Track Access, Network Licence, Franchise agreements, JNAPs
- Route maps
- Organisational charts / staff breakdowns

L.E.K. has also reviewed a large number of relevant reports and other documents (3 of 3)

Selected academic papers

- Vertical Relationships for the European Railway Industry; Cantos Sanchez; 2001
- Vertical and Horizontal Separation in the European Railway Sector and its Effect on Productivity; Cantos, Pastor and Serrano; 2010
- A New Approach to Private Roads; Engel, Fischer and Galetovic; 2002
- Railway (de)regulation: A European Efficiency Comparison; Friebel, Ivaldi & Vibes; 2005
- Economies of Scope in European Railways – An Efficiency Analysis; Growitsch and Wetzel; 2006
- Subadditivity Tests for Network Separation with an Application to U.S. Railroads; Ivaldi & McCullough; 2008
- Assessing the Efficient Cost of Sustaining Britain's Rail Network; Kennedy & Smith; 2004
- An Analysis of Vertical Separation of Railways; Kurosaki; 2008
- Enforcement of Yardstick Contracts and Consistency in Performance Rankings: An Application To The England and Wales Regulated Water Industry; Le Lannier; 2009
- An Application Proposal of Yardstick Competition to the Regional Markets of the French Railway System; Leveque; 2004
- Welfare Effect of Vertical Separation in Dutch Railways; Lijesen, Mulder and Driessen; 2005
- The Effects of Institutional, Environmental and Transactional Factors on Train Operating Company Performance; Merket, Smith & Nash; 2009
- Passenger railway reform in the last 20 years – European experience reconsidered; Nash; 2008
- Structural Separation to Create Competition? The Case of Freight Railways; Pittman; 2005
- Options for Re-Structuring the State Owned Monopoly Railway; Pittman; 2007
- Railway Mergers and Railway Alliances: Competition Issues and Lessons for Other Network Industries; Pittman; 2009
- Regulation Policy in Land Passenger Transportation in Europe; Preston; 2008
- Service Quality in Regulated Monopolies; Price, Brigham and Fitzgerald; 2002
- Vertical and Horizontal Separation in the European Railway Sector; Sanchez, Monsalvez & Martinez; 2008

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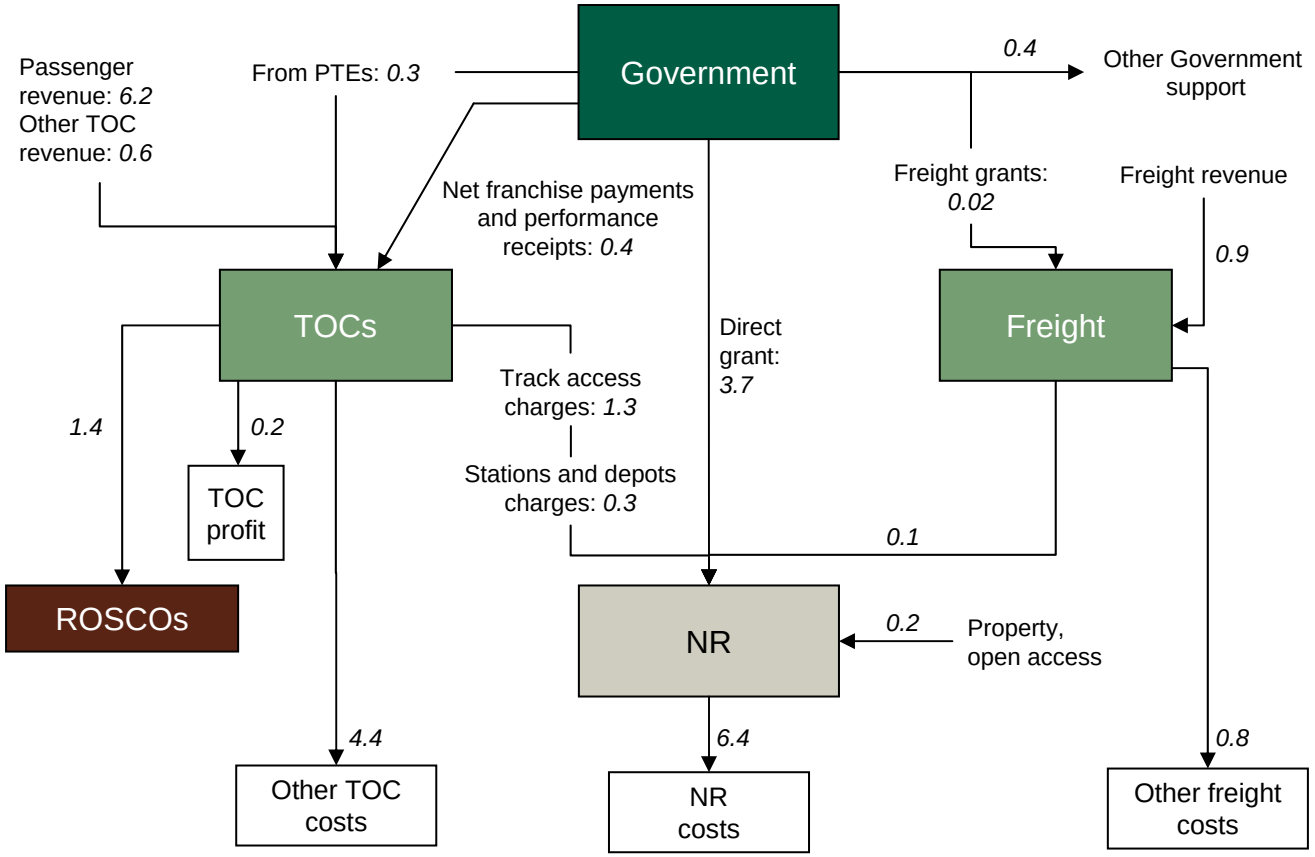
Introduction

- One objective of the project is to quantify, as far as possible, the costs and benefits of each shortlisted option
- The principal difficulty in quantification of each option is the large number of unknowns that accompany even the tightest of definitions for each potential option, for example:
  - uncertainty around the level of industry control that the DfT might be willing to cede as part of any or all options
  - the evolutionary and progressive nature of many options, e.g., “horses for courses” approaches
  - the importance of (as yet unknown) innovation in delivering improvements in whole-industry cost
  - the reality that different industry structures may affect the probability and speed of delivery of certain efficiencies, as much as the size of the efficiencies themselves
- As the first stage in quantification of the effects of any structural change to the industry, we have developed a baseline against which to measure the effects of these changes. This baseline contains a view of whole-industry costs and revenues
- The baseline scenario is defined as:
  - continuing operation of the rail industry under its current structure, with franchise reform as currently announced by the DfT (including longer TOC franchises), with NR under its current CLG ownership structure
  - including the ongoing efficiency improvements that industry participants might be reasonably expected to achieve within this structure

Total GB rail industry revenue is c.£7.9bn and costs are c.£12.9bn p.a.

Rail industry money flows (£bn) (2009/10)

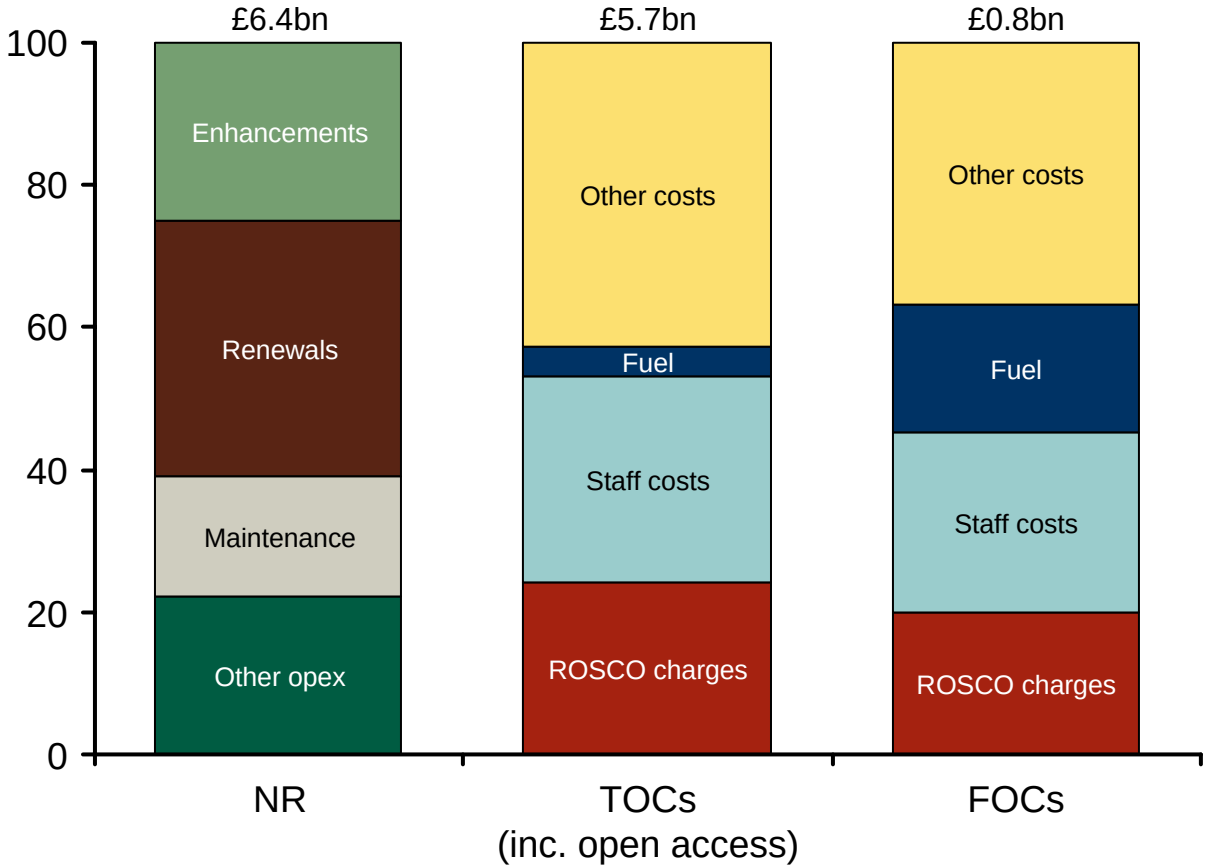


Note: Total industry cost excludes Network Rail debt finance costs and TOC profit
Source: Whole Industry Money Flows Study; DfT; L.E.K. analysis

Of the £12.9bn industry cost, £6.4bn is incurred by Network Rail

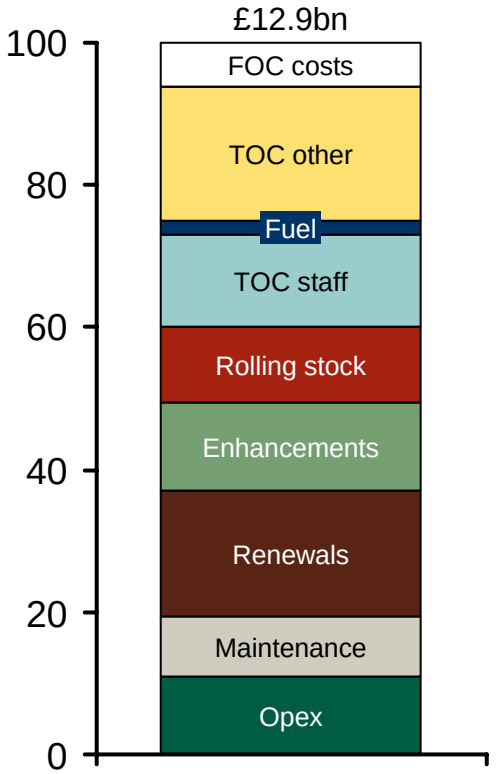
Whole industry cost structure (2009/10)

Percent



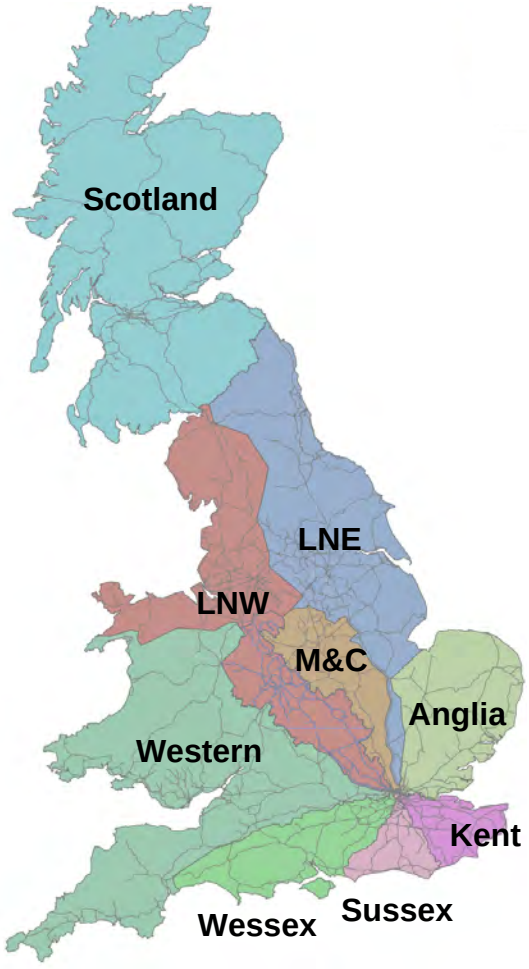
Whole industry costs (2009/10)

Percent



Note: Excludes Network Rail debt finance costs and TOC profit. Split is illustrative for FOC costs
Source: L.E.K. analysis

Network Rail does not produce regional P&Ls as part of its standard reporting process. However, it has conducted some analysis over the last year in order to develop indicative whole industry P&Ls for its nine operating routes



- Network Rail has completed some preliminary analysis to split industry costs and revenues across its nine operating routes
- NR's analysis is indicative, and relies on high-level cost allocation, e.g., by apportioning costs and revenues based on high-level metrics including route traffic, route length, staff headcount and number of stations
- The development of route level accounts is an ongoing NR workstream

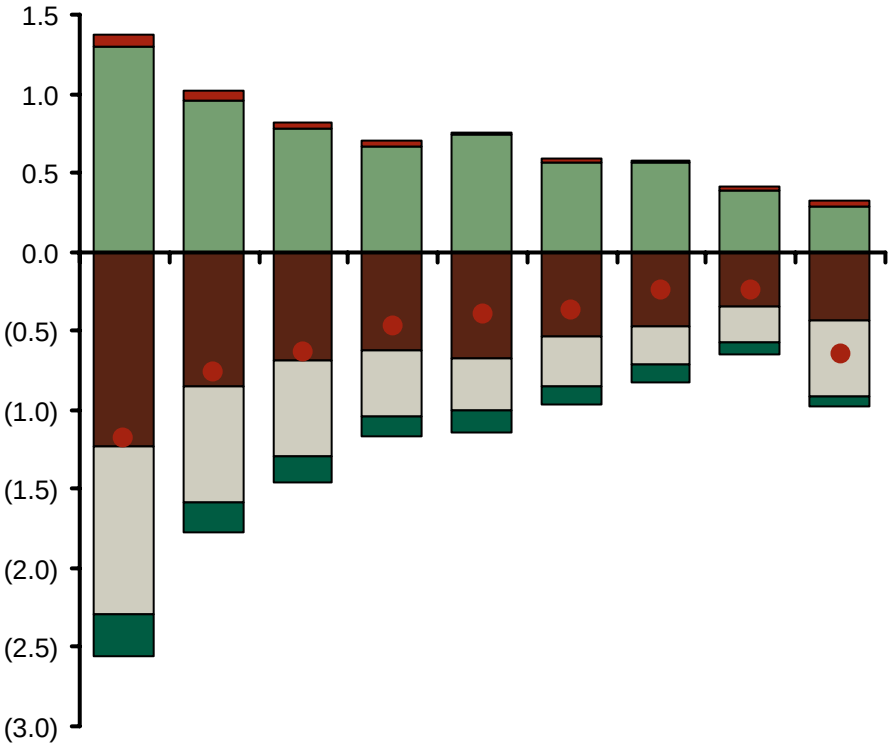
NR's route-based analysis allocates income and costs using a number of high-level metrics

		Details	NR operating route allocation methodology
Income	Passenger revenue		Franchised passenger revenue allocated to operating routes based on tonne-miles by TOC
	Other TOC revenue		Allocated pro-rata to franchised passenger revenue
	Freight income	Intra-industry freight access payment	Allocated according to billing
	Property income		Allocated pro-rata to track miles (used as a proxy for size of infrastructure)
	Open Access income	Intra-industry Open Access infrastructure access payment	Allocated on the basis of Open Access train miles
	Managed station income	Retail, advertising, concessions included; Station LTC & QX excluded	Allocated pro-rata to number of managed stations on each route
	Non-managed station income	Station lease income	Allocated pro-rata to number of non-managed stations
Costs	TOC costs	Intra-industry TOC costs excluded	Allocated pro-rata to franchised vehicle miles
	Opex, Maintenance and Renewals	Enhancement costs not included	EC4T allocated pro-rata to electric vehicle miles Franchised variable and electrification asset usage charges assumed to be reflective of cost and allocated by TOC billing Remaining costs allocated based on NR internal budgeting. Central costs allocated pro-rata to route-managed budgets
	Debt financing costs		Allocated pro-rata to franchised passenger revenue

Source: NR: "Industry Costs & Income – NR Operating Routes", 18 Nov 2010

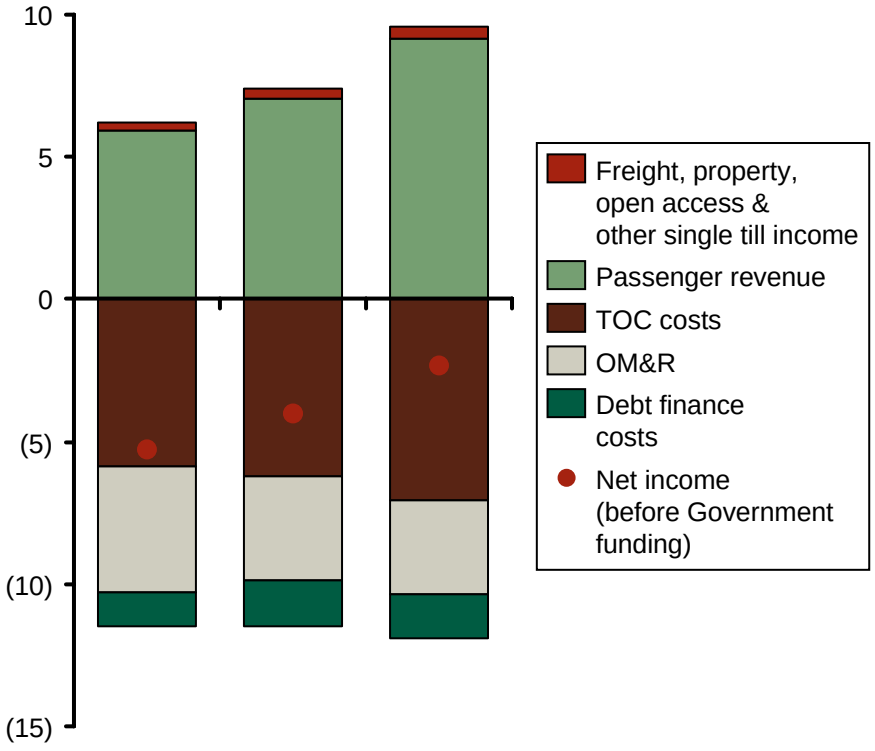
NR's analysis shows significant variation in income as a percentage of costs by operating route

NR's industry revenue and costs by NR Operating Route
Billions of 2009/10 pounds



	LNW	LNE	Western	Anglia	Wessex	Kent	Sussex	M&C	Scotland
Income as % of costs	54	57	56	60	66	61	70	63	34

NR's total industry revenue and costs by year
Billions of 2009/10 pounds



	2009/10	2013/14	2018/19
Income as % of costs	57	68	80

Source: NR, "Industry Costs & Income - NR Operating Routes", November 2010

L.E.K. has reviewed the NR approach and used it to develop its own view of whole industry regional P&Ls, as well as indicative results by TOC

		Regional split	TOC split
		Differences in L.E.K. approach to regional analysis vs. NR approach	TOC allocation method
Income	Passenger revenue	Unchanged	Inputs provided by the Rail VfM Team
	Other TOC revenue	Unchanged	Inputs provided by the Rail VfM Team
	Freight, property, open access & other single till income	Intra-industry freight, open access and station access payments to NR excluded	Allocated pro-rata to FTAC
	FOC revenue	Included. Allocated according to NR billing	Not included
	Open Access operator revenue	Included. Allocated according to Open Access train miles	Not included
Costs	TOC costs	Unchanged	Inputs provided by the Rail VfM Team
	Opex, Maintenance and Renewals	Unchanged	Allocated pro-rata to FTAC
	Enhancements	Included. Allocated pro-rata to renewals spend	Allocated pro-rata to FTAC
	Debt financing costs	Unchanged	Allocated pro-rata to FTAC
	FOC costs	Included. Allocated pro-rata to freight income	Not included
	Open Access operator costs	Included. Allocated according to Open Access train miles	Not included
	Regulator costs*	Included. Allocated pro-rata to track miles	Allocated pro-rata to FTAC

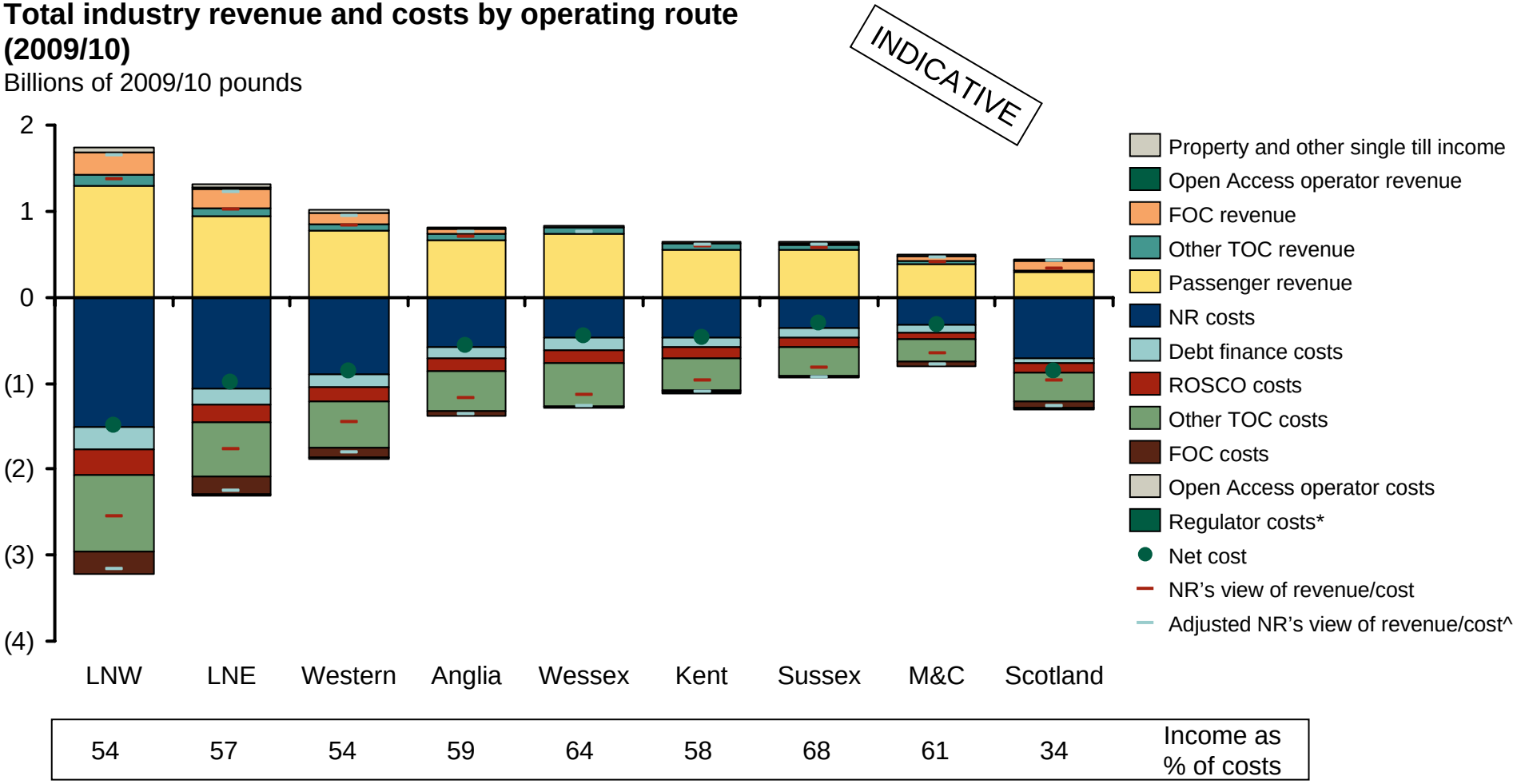
Note: * Includes RSSB, RAIB and DfT Rail costs
Source: DfT; ORR; NR

- L.E.K. has not attempted to verify NR's calculations of regional splits for the allocation metrics used
- While the cost allocation based approach to identifying regional industry P&Ls is very high-level and therefore only indicative, L.E.K. and Network Rail believe the approach to be sufficiently robust to inform decision-making for purposes of this project

L.E.K.'s indicative view of the regional split of total industry costs and revenue is similar to NR's version

Total industry revenue and costs by operating route (2009/10)

Billions of 2009/10 pounds



54	57	54	59	64	58	68	61	34	Income as % of costs

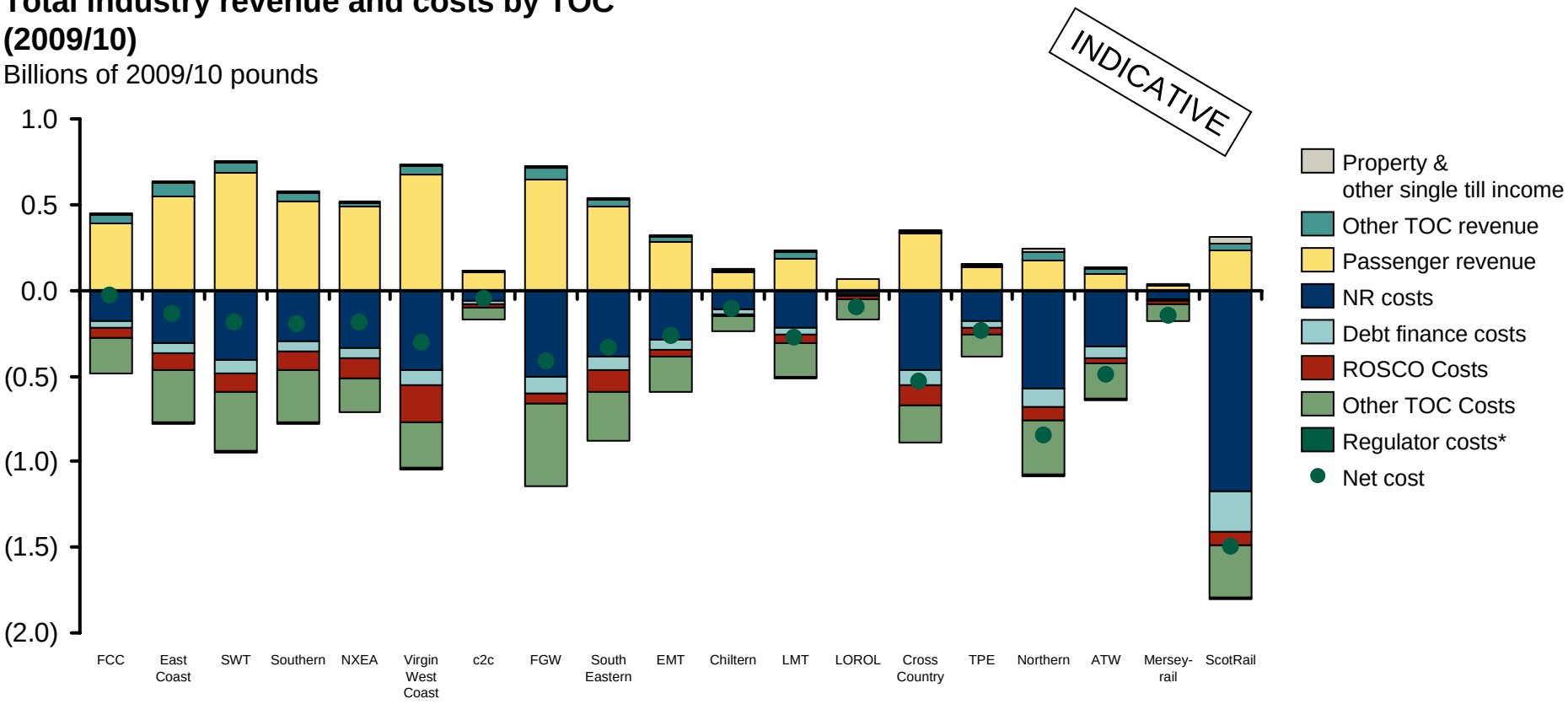
Note: * Includes RSSB, RAIB and DfT Rail costs; ^ Including freight income and costs, enhancements and regulator costs for purpose of comparison

Source: DfT; ORR; NR

Allocation by TOC also shows significant variation in income as a percentage of costs with ScotRail, Merseyrail, ATW and Northern all having income of less than a quarter of their whole industry cost

Total industry revenue and costs by TOC (2009/10)

Billions of 2009/10 pounds



FCC	East Coast	SWT	Southern	NXEA	Virgin West Coast	c2c	FGW	South Eastern	EMT	Chiltern	LMT	LOROL	Cross Country	TPE	Northern	ATW	Mersey-rail	ScotRail	
93	82	80	74	73	71	68	63	62	55	51	46	41	40	39	22	22	17	17	Income as % of costs
2	5	6	8	8	9	9	13	14	22	20	26	36	29	28	70	78	72	95	Subsidy per pax mile (pence)

Note: * Includes RSSB, RAIB and DfT Rail costs; Excludes freight and Open Access operators

Source: DfT; ORR; NR

The ORR's PR08 determination concluded that there was a significant efficiency gap between NR and top quartile comparators…

- The ORR carried out extensive work during the PR08 process to assess NR's efficiency, including:
  - Maintenance and renewals: Econometric analysis of the International Union of Railways (UIC) "Lasting Infrastructure Cost Benchmarking" (LICB) dataset, which comprises M&R expenditure and other data for 13 European rail infrastructure managers, including NR, for the 11 years to 2006
  - Operating expenditure: Analysis of operating expenditure improvements achieved by other regulated utilities
- The ORR concluded that there was a significant efficiency gap between NR and top quartile comparators, but that the range of uncertainty over the size of this gap was significant
- The ORR analysed the rate of improvement achieved by companies in other regulated industries and made a high level judgement that "NR should be able to catch up two thirds of the efficiency gap during CP4"
- NR has now submitted plans to the ORR which show that it will be able to deliver the required outputs in line with ORR's determination of NR's revenue requirement
  - NR has launched a Transformation Programme to help it to achieve this
- NR's planning for delivery of the additional efficiency savings likely to be required of it during CP5 is still at a very early stage

Source: Periodic Review 2008, Determination of Network Rail's outputs and funding for 2009-14, October 2008, ORR

… and it identified significant cost efficiencies for NR to deliver over CP4, with further indicative efficiencies for CP5

Efficiency vs. 2008/09 *(Percent)*	CP4	Indicative CP5	Total CP4 + CP5
Controllable opex			
Catch-up efficiency	22.2	12	34
Frontier-shift efficiency	1.0	1	2
Gross efficiency	23.0	12	36
Maintenance			
Catch-up efficiency	20.4	10	30
Frontier-shift efficiency	3.5	3	6
Gross efficiency	23.3	12	35
Renewals			
Catch-up efficiency	23.8	12	36
Frontier-shift efficiency	3.5	3	6
Gross efficiency	26.5	13	40
OM&R (weighted)			
Catch-up efficiency	22.6	12	34
Frontier-shift efficiency	3.0	3	6
Gross efficiency	25.0	13	38

- In PR08, the ORR specified two components of efficiency for opex, maintenance and renewals:
  - **catch-up efficiency**: the efficiency improvement that NR should make to close the gap with better performing benchmark companies
  - **frontier-shift efficiency**: the continual improvement in efficiency that would be expected from better performing companies
- The PR08 determination also makes allowance for changes in NR's input prices to reflect the impact of expected input price inflation on NR's cost base
- The efficiencies shown in the table represent ORR's final determination for CP4 and indicative efficiencies for CP5
  - gross efficiencies are calculated on a compounded basis and are therefore not necessarily additive
- The ORR also expects NR to deliver enhancement cost efficiencies, which vary by project type and include elements of catch-up/scope and frontier-shift efficiency

Source: Periodic Review 2008, Determination of Network Rail's outputs and funding for 2009-14, October 2008, ORR; L.E.K. analysis

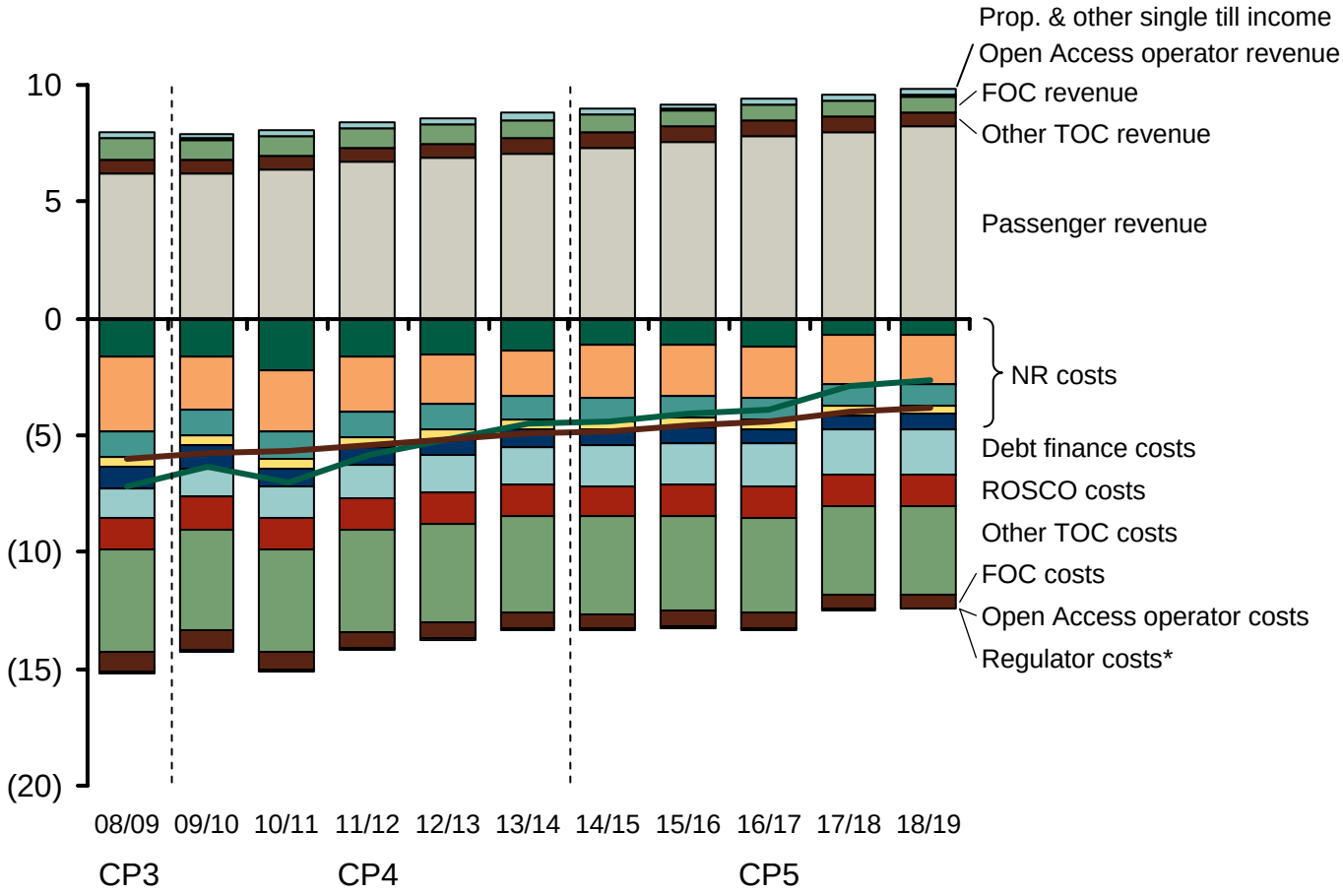
The baseline may also be impacted by a number of government policy changes related to franchise specification, incentives and fares regulation. As the nature and timing of these changes remains uncertain, no specific revenue or cost adjustments have been included

	Description
Longer TOC franchises and greater TOC flexibility	• Move to 15 year TOC franchises • Potential franchise reform to allow TOCs greater flexibility • NR and TOCs encouraged to work more closely together • Likely removal of Schedule 9 / Clause 18.1
Economic fares regulation	• Additional TOC fare-setting freedom leading to additional passenger revenue and improved demand management
Better station management	• TOCs to manage stations
Better rolling stock procurement	• Opportunity for efficiencies in rolling stock procurement

The baseline shows whole industry net costs reducing through to the end of CP5

Total industry revenue and costs (expenditure)

Billions of 2009/10 pounds



- NR cash costs based on:
  - NR accounts up to 2009/10
  - ORR Periodic Review determination for CP4
  - ORR indicative model results for CP5
- Debt finance costs based on:
  - NR accounts for 2009/10
  - forecast based on NR analysis
- TOC revenues and costs are based on data and forecasts provided by the Rail VfM Team

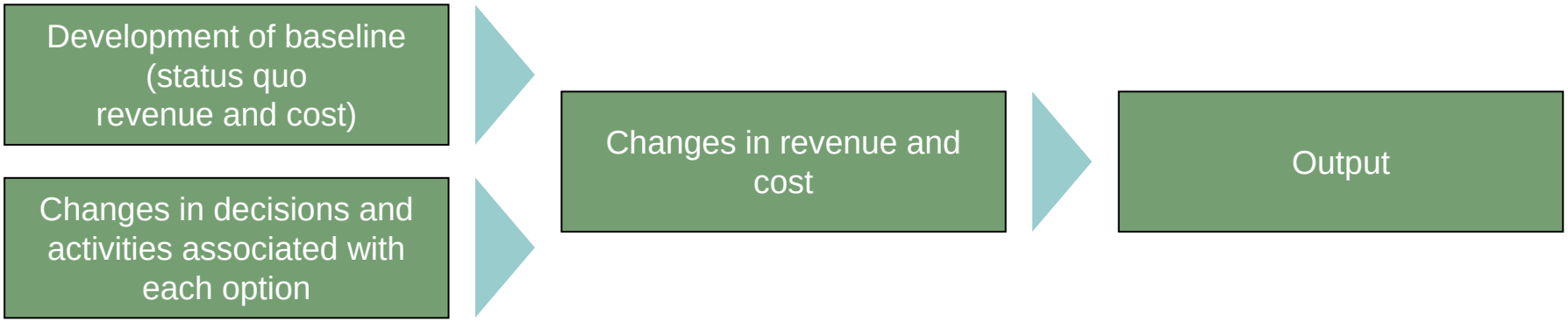
NR costs:

- Enhancements
- Renewals
- Maintenance
- Non-controllable opex
- Controllable opex
- Net cost
- Net cost based on NR revenue requirement

Note: * Includes RSSB, RAIB and DfT Rail costs

Source: DfT; ORR; NR; L.E.K. analysis

L.E.K.'s approach to quantification of the different structural options draws on the available evidence and previous work to map cost savings onto the industry options that enable them



- Identify the changes in decisions and activities, relative to the baseline, enabled by the short-listed structural options
- Changes identified with reference to our recommended implementation path, from each structural option to the next

- Complete a review of the available data sources, including relevant reports, evidence from other regulated industries and international comparators
- Map the identified efficiencies to their structural enablers, and hence to the changes between structural options
- Compile and synthesise the impacts of each option to identify the extent to which each enables the UK to achieve similar efficiency levels to the best performing comparators

- Produce quantified benefits delivered by each option, using ranges to reflect uncertainty in size of efficiency, delivery probability and timing
- Identify potential range of future industry costs, including threshold tests for recommended process at each stage

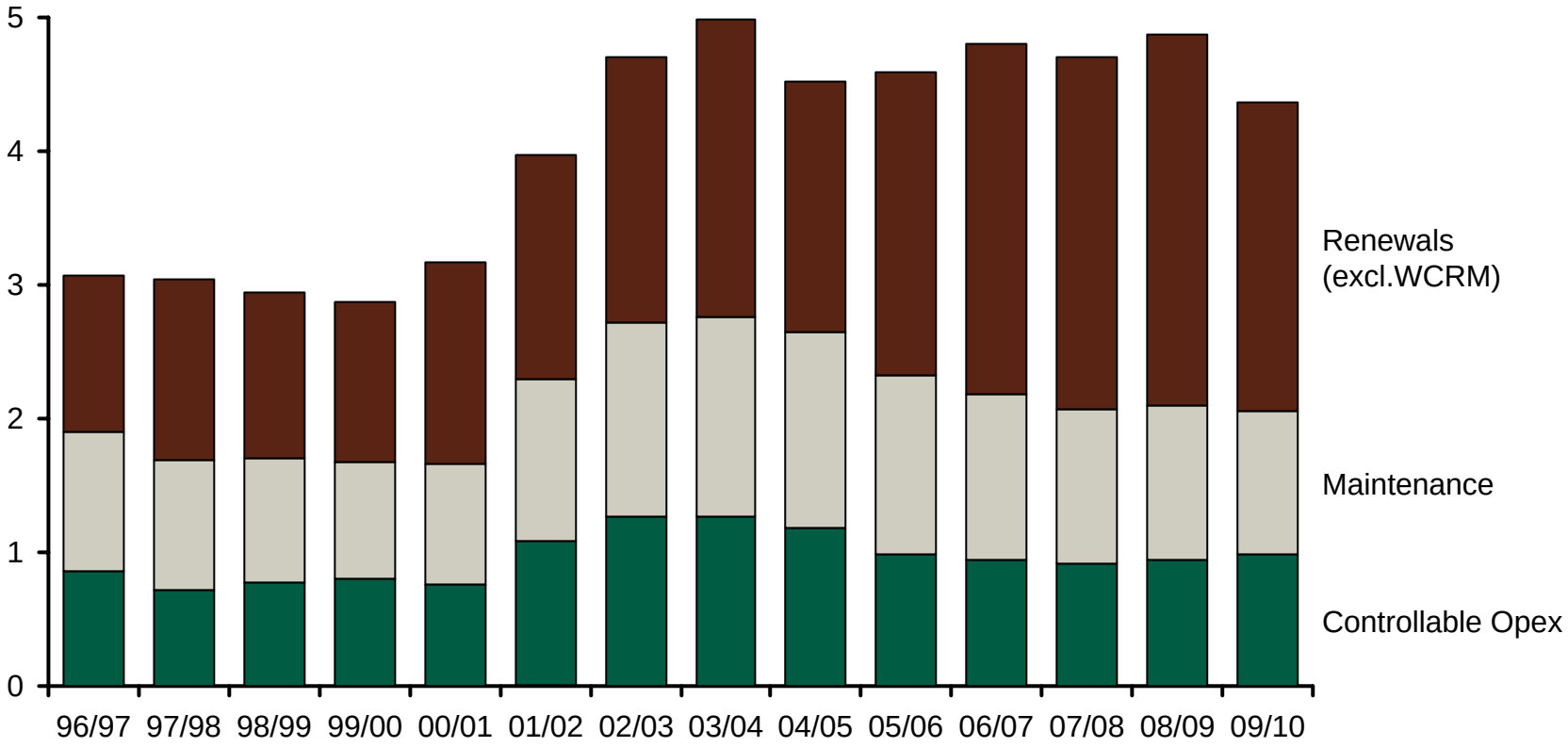
Quantification – principal sources used

Source	Document title / description
Network Rail	CP4 Delivery Plan Update 2010
	Regional organisation charts, staffing details and cost analysis
ORR	National Rail Trends 2009-10 Yearbook, 2010
	Periodic Review 2008, Determination of Network Rail's outputs and funding for 2009-14, 2008
	Annual efficiency and finance assessment of Network Rail 2009-10, 2010
	International cost efficiency benchmarking of Network Rail, 2010
ARUP	International Review of Service Delivery, 2010
BSL	Rail Infrastructure Cost Benchmarking, 2008
RailKonsult	Relative Infrastructure Managers' Efficiency, 2010
Ofgem	National Grid Transco – Potential sale of gas distribution network businesses, Final Impact Assessment, 2004
	Gas Distribution Price Control Review, Final Proposals Document, 2007
National Audit Office	Sale of gas networks by National Grid, 2006
First Economics	The Break-up of National Grid's Gas Distribution Business, prepared for ATOC, 2010
L.E.K.	Radical Possessions Strategies, 2003
L.E.K./Oxera	Assessing Network Rail's scope for efficiency gains over CP4 and beyond: a preliminary study, 2005
GHD	Asset management implications for alternative railway structures
Atkins	Asset Management and Supply Chain Management Assessment of GB Rail, 2010
Oxera	Review of rail cross-industry interfaces, incentives, and structures, 2010
SDG	Rail Value for Money Study - Leadership planning and decision making, 2010
Rail Value for Money team	"Should cost" analysis, 2010
Other	TOC and contractor evidence on achieved and potential efficiency savings
	Asset Management for Improving Business Performance – The MTR Experience, 2010

NR's historical expenditure has remained relatively constant in real terms over the past eight years. It should be noted that the number of train miles has increased significantly since 96/97 and that NR is currently carrying out more than the steady state level of renewals

Opex, Maintenance and Renewals costs

Billions of 2009/10 pounds



Note: Nominal to real price conversion using RPI

Source: NR; ONS; L.E.K. analysis

The ORR's most recent work to update its cost efficiency benchmarking suggests an efficiency gap to the frontier of international comparators of around 37%

Efficiency gap for maintenance and renewals in 2008/09

Percent		Best estimate	Range		
			Low	Mid	High
PR08 results	To frontier	38	28	36	44
	To upper quartile	35	22	32	41
2010 update	To frontier	n/a	34	37	40
	To upper quartile	n/a	29	33	37
Change	To frontier	n/a	6	1	(4)
	To upper quartile	n/a	7	2	(4)

- ORR's international cost efficiency benchmarking identified a best estimate maintenance and renewals efficiency gap of 35% to upper quartile international comparator performance for the purposes of PR08
- Its 2010 update narrows the range of the identified efficiency gap around similar mid-point positions
- Dr Michael Pollitt, of the University of Cambridge, conducted a review of ORR's methodology and identified that the efficiency methodology adopted by ORR would be better to identify the savings relative to the frontier, rather than the upper quartile
- Both the PR08 results and the 2010 update suggest that NR's 2008/09 maintenance and renewals efficiency gap to the frontier was c.37%

Source: International cost efficiency benchmarking of Network Rail, September 2010, ORR

The Rail VfM team's "should cost" analysis indicates potential industry savings of £2.5 - 3.5bn of 2008/09 costs if it were operating at the efficiency frontier

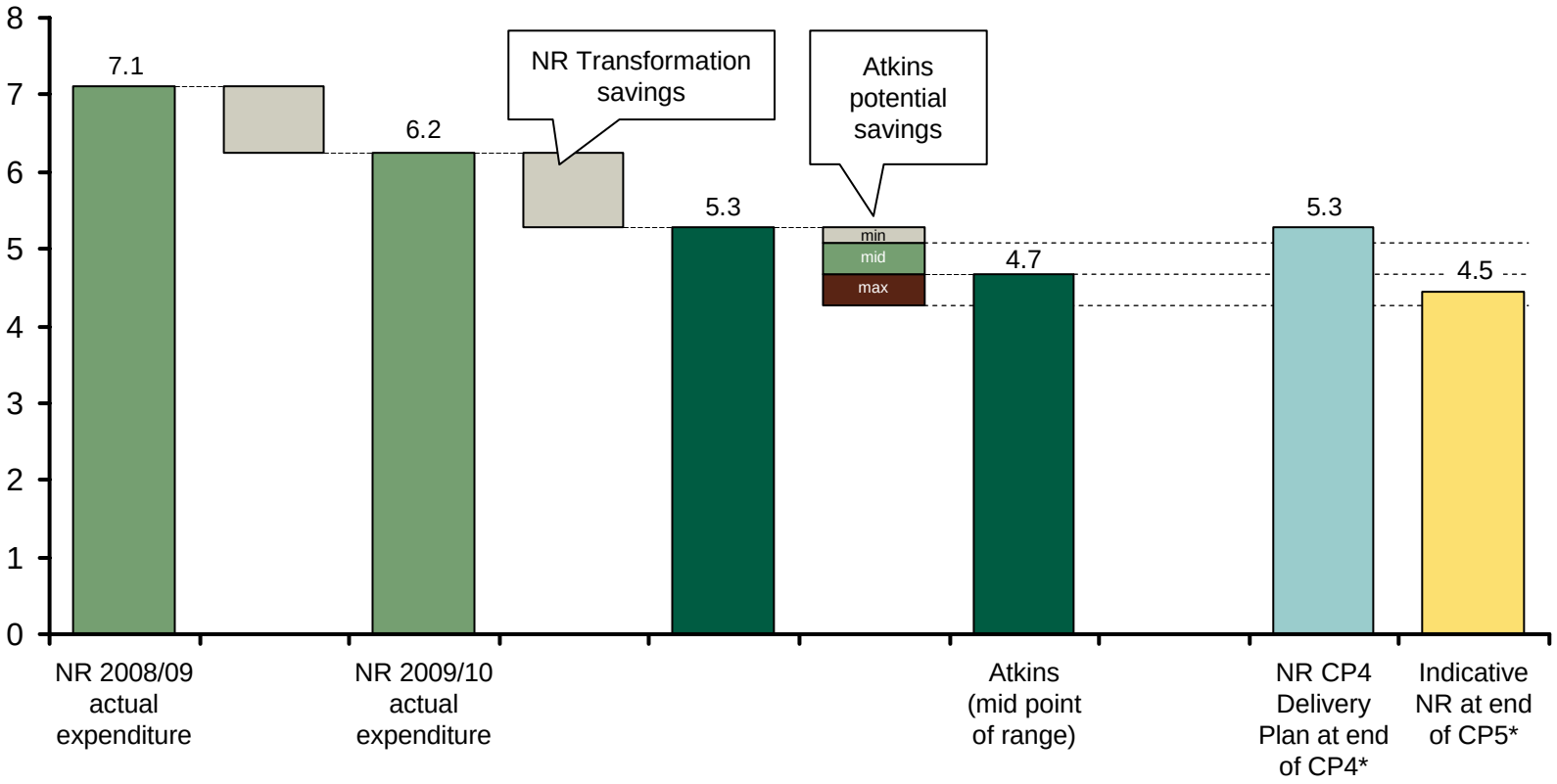
£bn	Actual 2008/09	"Should cost"		Difference	
		Low	High	Low	High
Uncontrollable opex	0.4	0.4	0.4	0	0
Operating costs	0.9	0.6	0.5	(0.3)	(0.4)
Maintenance	1.1	0.8	0.6	(0.3)	(0.5)
Renewals	3.2	2.0	1.7	(1.1)	(1.2)
Enhancement	1.3*	1.3	1.3	0	0
Total Network Rail	6.9	5.1	4.6	(1.8)	(2.3)
TOCs	5.1	4.4	4.0	(0.7)	(1.2)
Total	12.0	9.5	8.6	(2.5)	(3.5)

- The McNulty interim submission presented a "should cost" analysis to identify what the GB railway should cost if it was operating at the frontier of efficiency, on an expenditure basis
  - results should be treated with a considerable degree of caution
- This "should cost" analysis identified a NR range of savings of £1.8 - 2.3bn, which compares to the £1.9bn of savings already required of NR by the ORR for CP4 and indicated for CP5
  - high-end savings were developed by the RVfM team assuming that NR performance exceeds that of the best-performing European railways, delivering performance similar to that demonstrated by US Class I Railroads and top-performing regulated companies
  - note that this excludes cost savings that might be delivered for enhancement expenditure
- For TOCs, the "should cost" analysis low-end cost saving implies similar real costs per train km as 1995/96, in line with FOC and open access operator performance
  - high-end savings assume an additional 10% cost reduction, based on European franchising examples

Note: * Excludes enhancements funded by third parties
Source: Interim Submission to Secretary of State – September 2010, Rail Value for Money Study; RVfM Team analysis

Atkins identifies potential industry cost savings driven by improved asset management and supply chain management activities. These imply efficiencies in Network Rail costs for comparison to its CP4 and indicative CP5 regulatory cost targets

Indicative Network Rail cost
Billions of 2008/09 pounds



Note: * After adjustment to 2008/09 efficiency frontier and input pricing, based using the ORR's PR08 determination results
Source: Rail Value for Money Study, 2010; Atkins; L.E.K. analysis

When National Grid decided to sell a number of its gas distribution networks ("GDNs"), Ofgem developed an estimate of the resulting total customer benefits delivered through efficiency improvements in operating expenditure

- National Grid decided to sell a number of its gas distribution businesses in 2003
- Ofgem explored the impact of different sale scenarios, and found the biggest driver of customer benefits to be the number of new entrants to the sector
- In the final sale, there were three new owners entering the market, operating the 4 GDNs
- Ofgem expected the additional efficiency gain from comparative regulation to be an average of 1.13% p.a. for 15 years, with a range of 0.66 – 2.40% p.a.
- This is considered a conservative estimate

  "…In practice, the net benefits could be higher as the analysis included operating expenditure but did not consider possible savings from more efficient capital expenditure …"

  NAO, 2006

Expected customer benefits p.a. (reduction in allowed controllable Opex)*

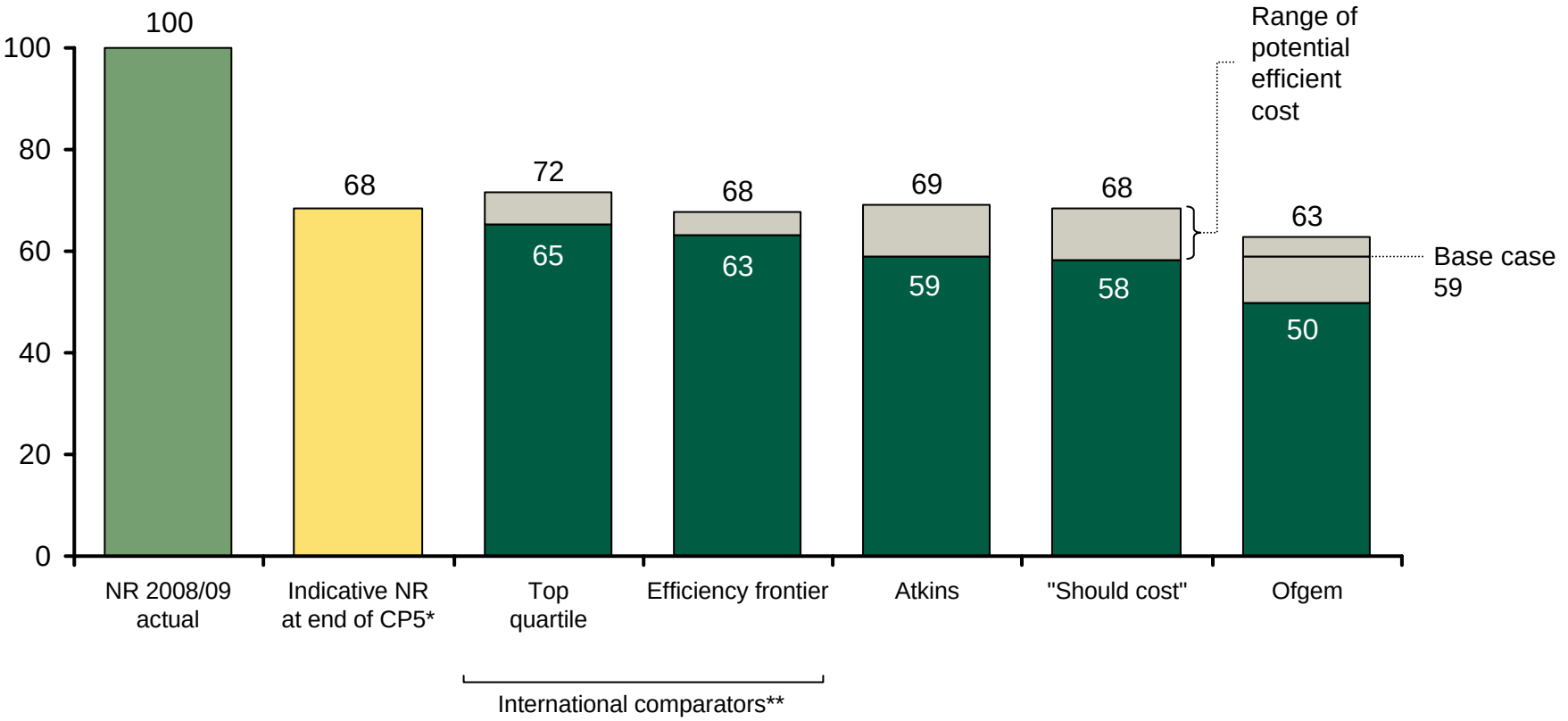
Number of separate owners	Total annual efficiency improvement			Efficiency improvement relative to no sale		
	Low case (%)	Best estimate (%)	High case (%)	Low case (%)	Best estimate (%)	High case (%)
No sale	3.25	3.00	3.00	-	-	-
1	3.55	3.50	4.09	0.30	0.50	1.09
2	3.77	3.87	4.86	0.52	0.87	1.86
3 (sale option)	3.91	4.13	5.40	0.66	1.13	2.40
4	4.00	4.30	5.80	0.75	1.30	2.80

Note: * As estimated by Ofgem in the Final Impact Assessment, 2004
Source: NAO; Ofgem

For NR, a range of sources identify additional potential cost savings beyond that required by the PR08 determination, typically subject to significant uncertainty

Indicative Network Rail expenditure under different efficiency assumptions

Indexed 2008/09 pounds (NR 2008/09 actual = 100)



Note: Excluding enhancement spend. * After adjustment for 2008/09 outturn relative to ORR determination and to 2008/09 efficiency frontier and input pricing using the ORR's PR08 determination results. ** For maintenance and renewals costs; Other costs based on Indicative NR at end of CP5 levels
Source: NR; ORR; RVfM Team; RailKonsult; Atkins; L.E.K. analysis

Alternative sources suggest additional potential efficiency improvements of up to 27% of 2008/09 spend relative to the NR baseline

Potential NR efficiency savings		Relative to 2008/09		Relative to baseline		Comments
		Percent	£bn 2008/09	Percent	£bn 2008/09	
Baseline: Indicative NR at end of CP5*		32	1.75	0	0.00	• ORR CP4 determination plus estimated subsequent improvement, based on indicative ORR efficiency improvement in order to move NR in line with top quartile of international comparators. Adjusted for under-performance in 2008/09 vs. CP3 target
International comparator efficiency frontier**	Low	32	1.79	1	0.04	• Range of potential efficiency gaps to frontier of international comparator performance, as defined by 13 European rail infrastructure managers in the UIC's LICB database
	High	37	2.05	8	0.30	
Atkins	Low	31	1.72	(1)	(0.03)	• Identifies potential industry cost savings driven by improved asset management and supply chain management activities • Not specifically linked to different industry structural options but incremental to NR's Transformation plan for CP4
	High	41	2.28	14	0.53	
"Should cost"	Low	32	1.75	0	0.00	• Additional efficiency saving, beyond that indicated by the ORR for the end of CP5, is identified by taking a different view of NR's efficiency gap vs. the PR08 determination
	High	42	2.31	15	0.56	
Ofgem efficiency saving increment	Low	37	2.08	9	0.32	• Efficiency improvement derived from analysis of operating expenditure for 3 additional owners, relative to baseline • Full benefit delivered after 15 years • Driven by competitive regional regulation and multiple ownership
	Base	41	2.29	14	0.53	
	High	50	2.79	27	1.04	

Note: Excluding enhancement spend. * After adjustment for 2008/09 outturn relative to ORR determination and to 2008/09 efficiency frontier and input pricing using the ORR's PR08 determination results. ** For maintenance and renewals costs; Other costs based on Indicative NR at end of CP5 levels
Source: NR; ORR; RVfM Team; RailKonsult; Atkins; L.E.K. analysis

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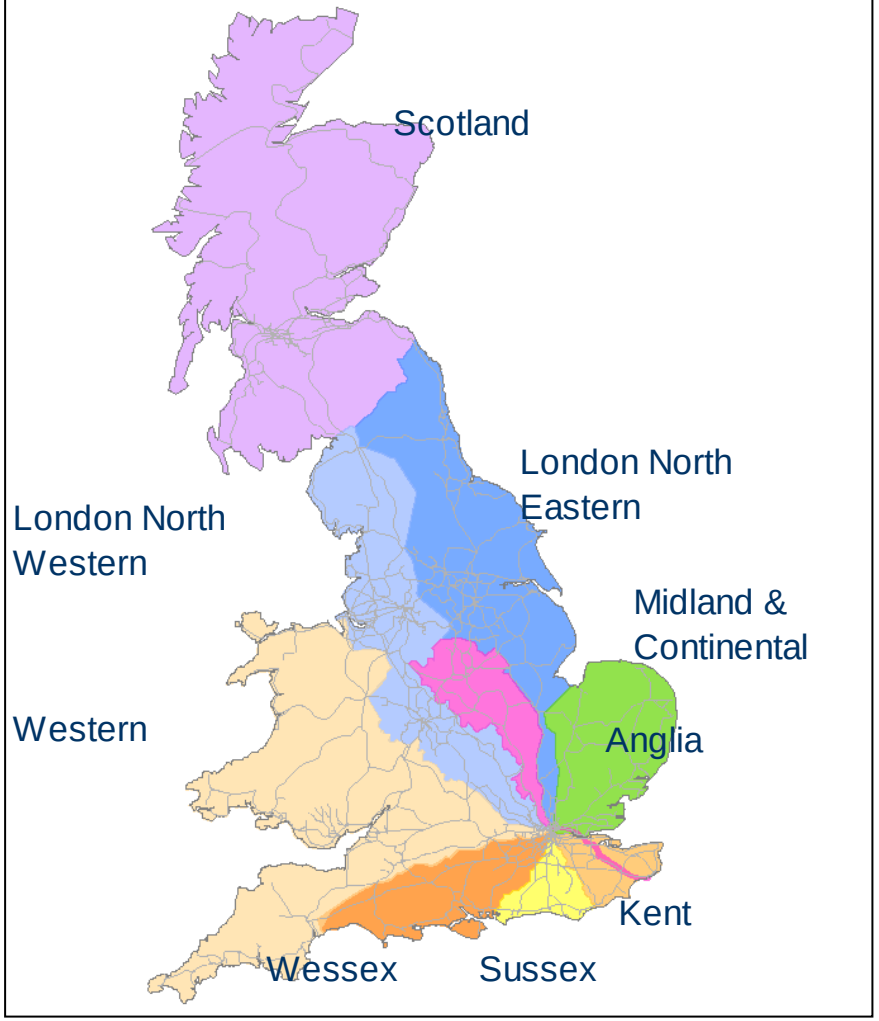
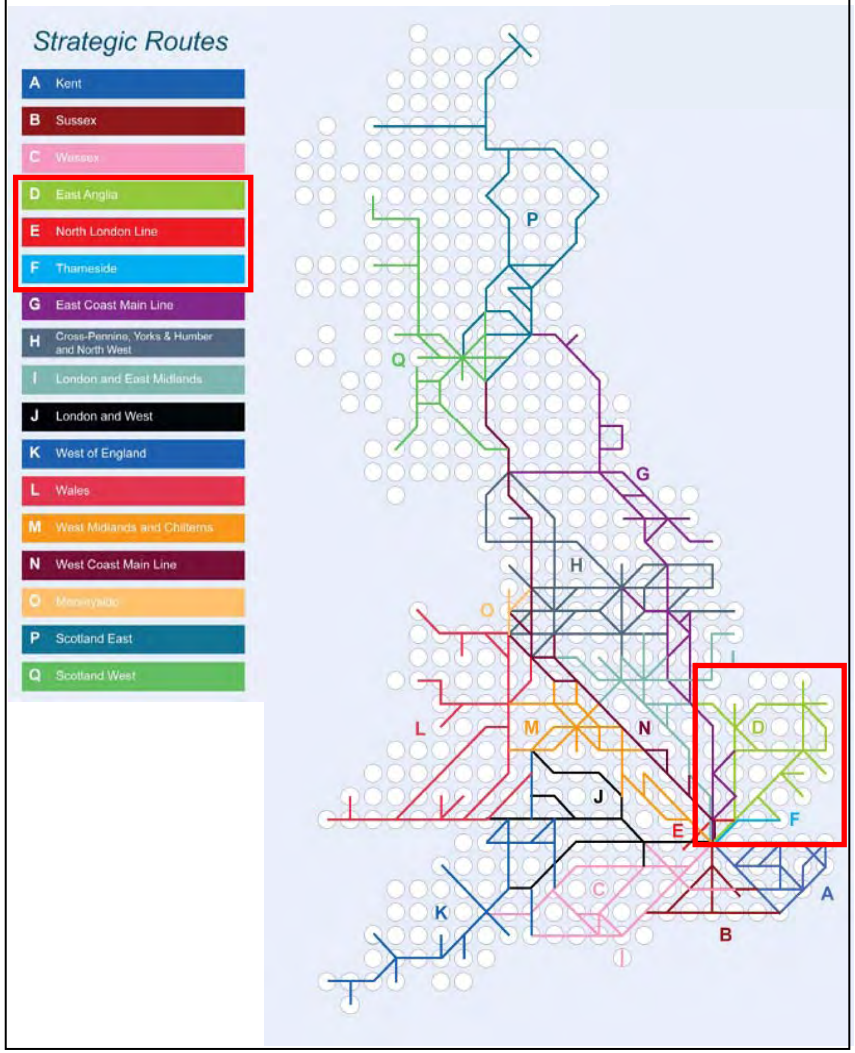
The Anglia case study covers the area included in NR's Anglia Operating Route. This includes the East Anglia and Thameside Strategic Routes

NR operating routes



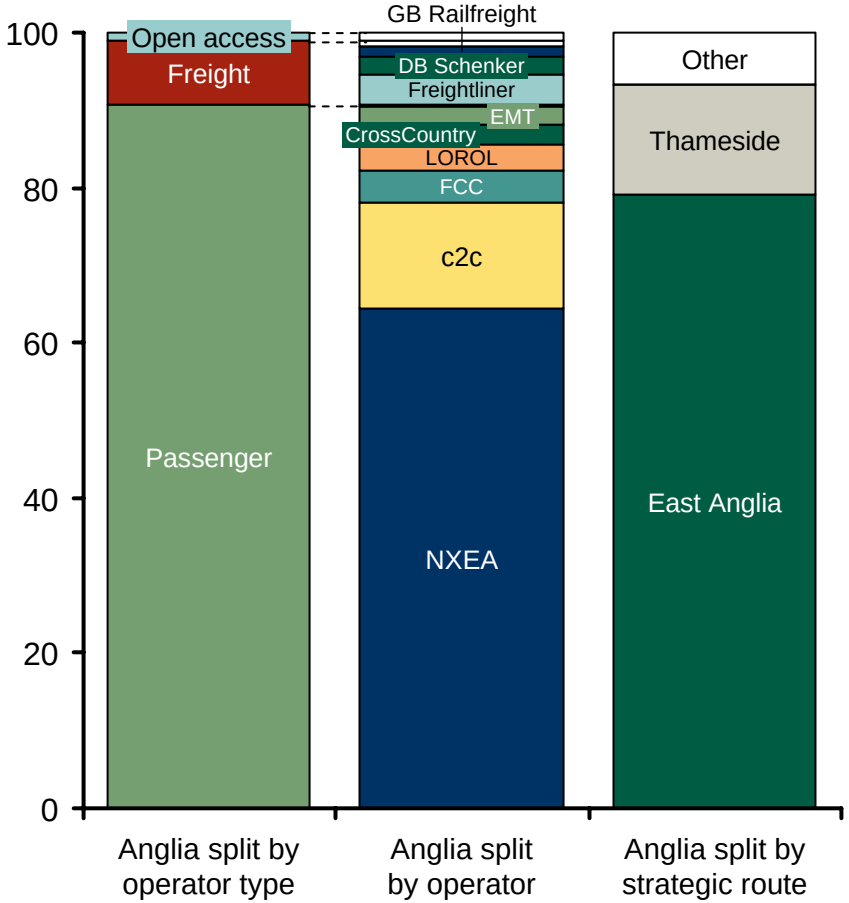
NR strategic routes



NXEA and c2c account for nearly 80% of the train kms in the Anglia region, while freight operators account for nearly 10% of the train kms

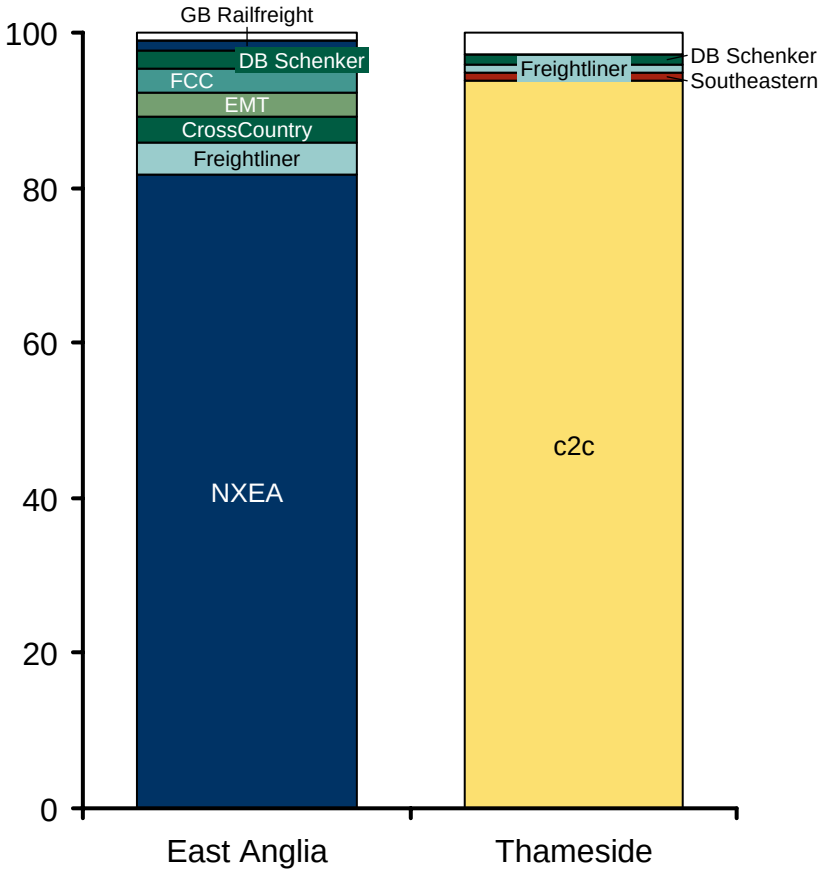
Anglia's train kms by operator type*

Percent of train kms



Split of Anglia's two main strategic routes

Percent of train kms

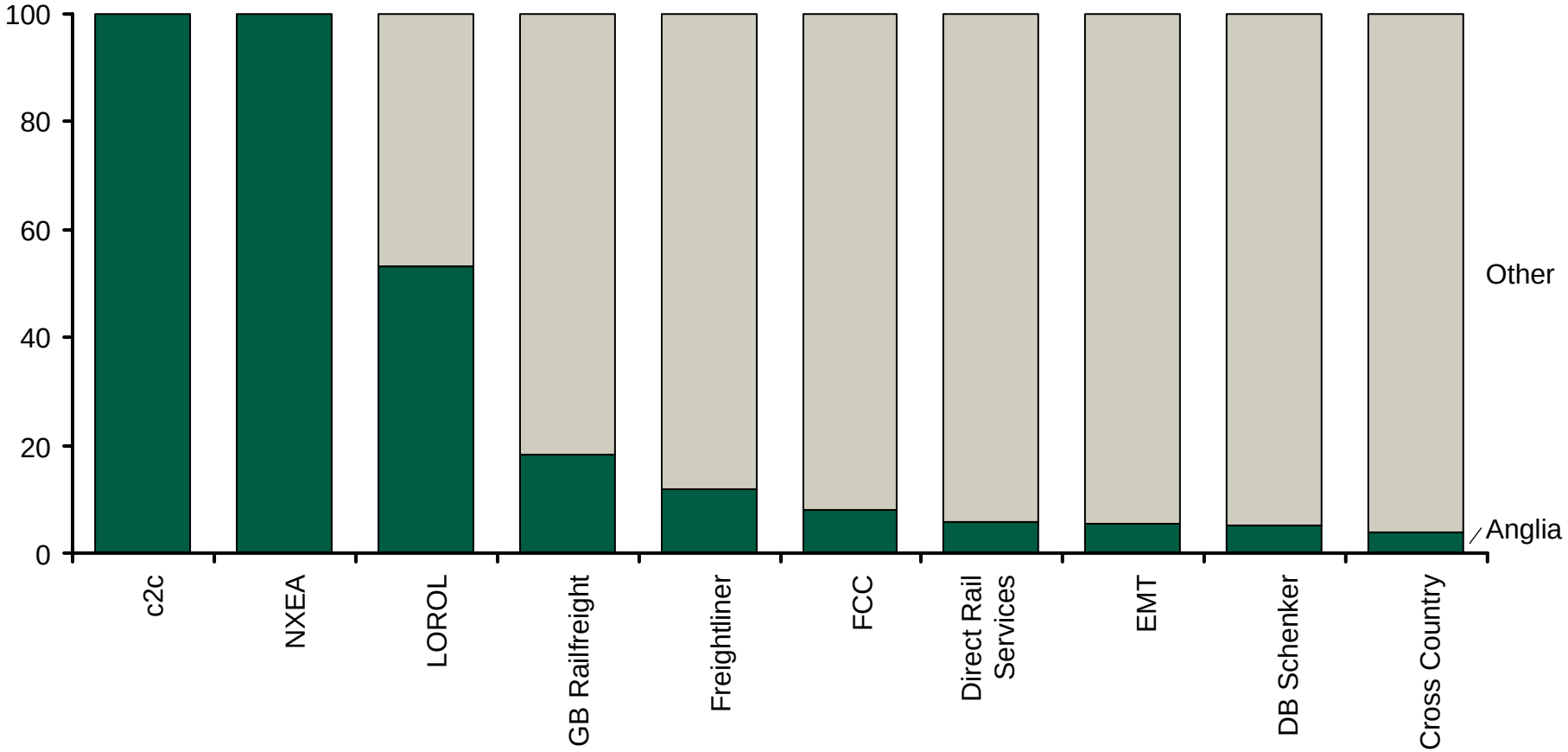


Source: NR; L.E.K. analysis

Nearly all of NXEA's and c2c's services are within the Anglia region

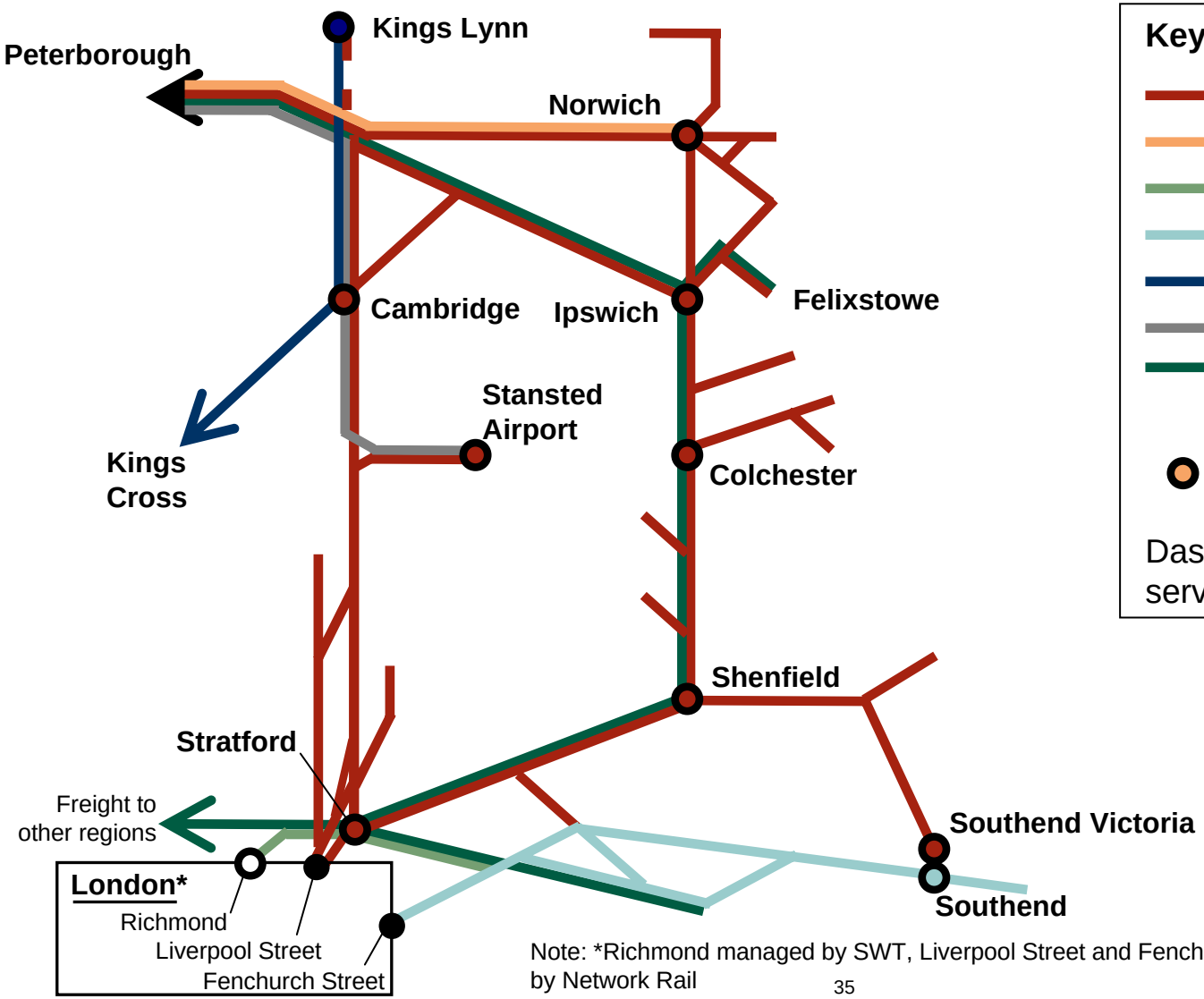
Operators' total train kms split by operating route

Percent of train kms



Source: NR; L.E.K. analysis

The largest interfaces are between NXEA / c2c and the freight operators. The interfaces with other passenger TOCs take place on less congested parts of the network away from the mainline approaches to London



Key

- NXEA
- EMT
- LOROL
- c2c
- FCC
- Arriva Cross Country
- Freight (only principal flows shown)
- Colour indicates manager of station

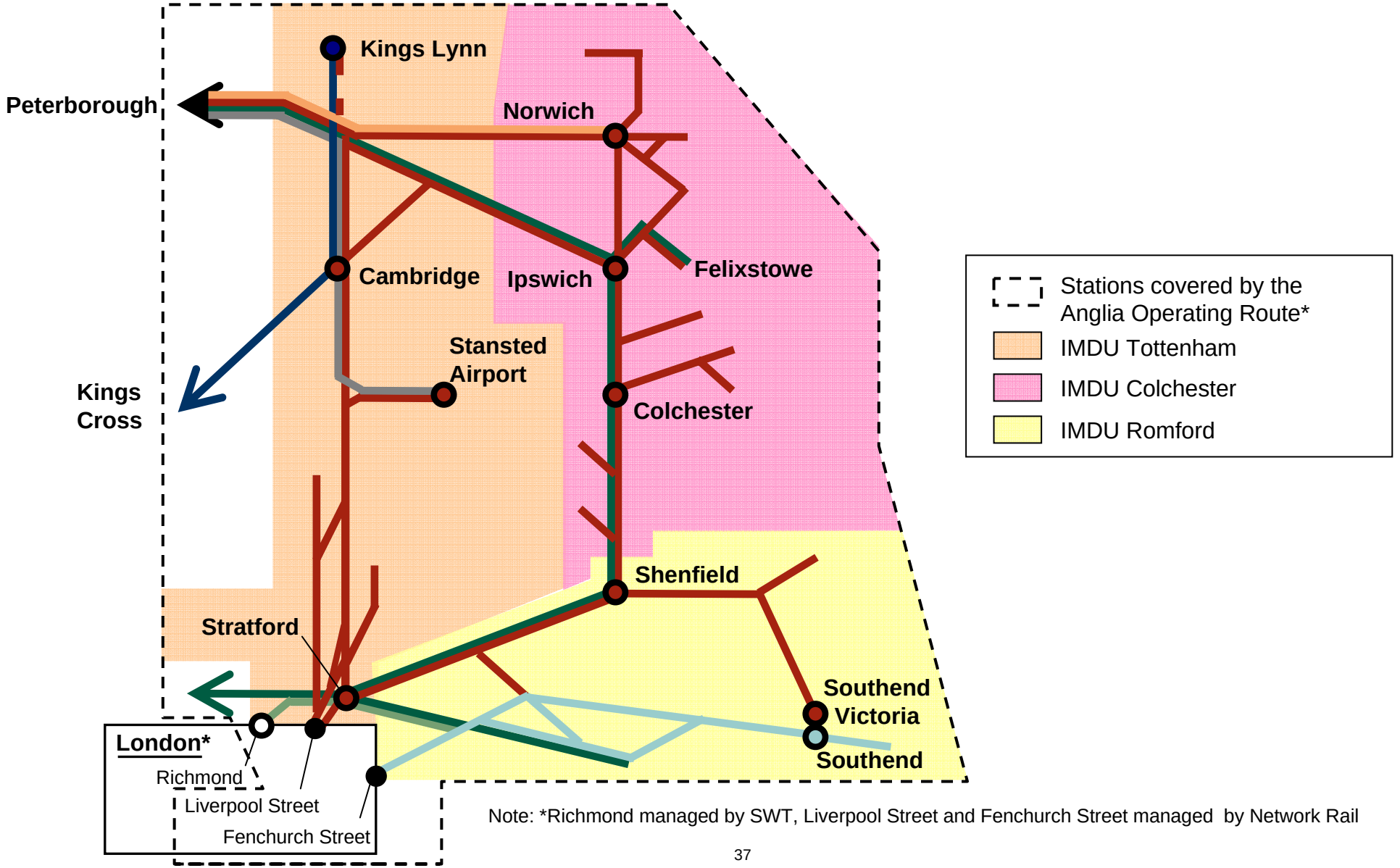
Dashed line indicates limited service

Note: *Richmond managed by SWT, Liverpool Street and Fenchurch Street managed by Network Rail

The Anglia region is relatively self contained from a train operators perspective. The critical interface is with freight on the Great Eastern Main Line

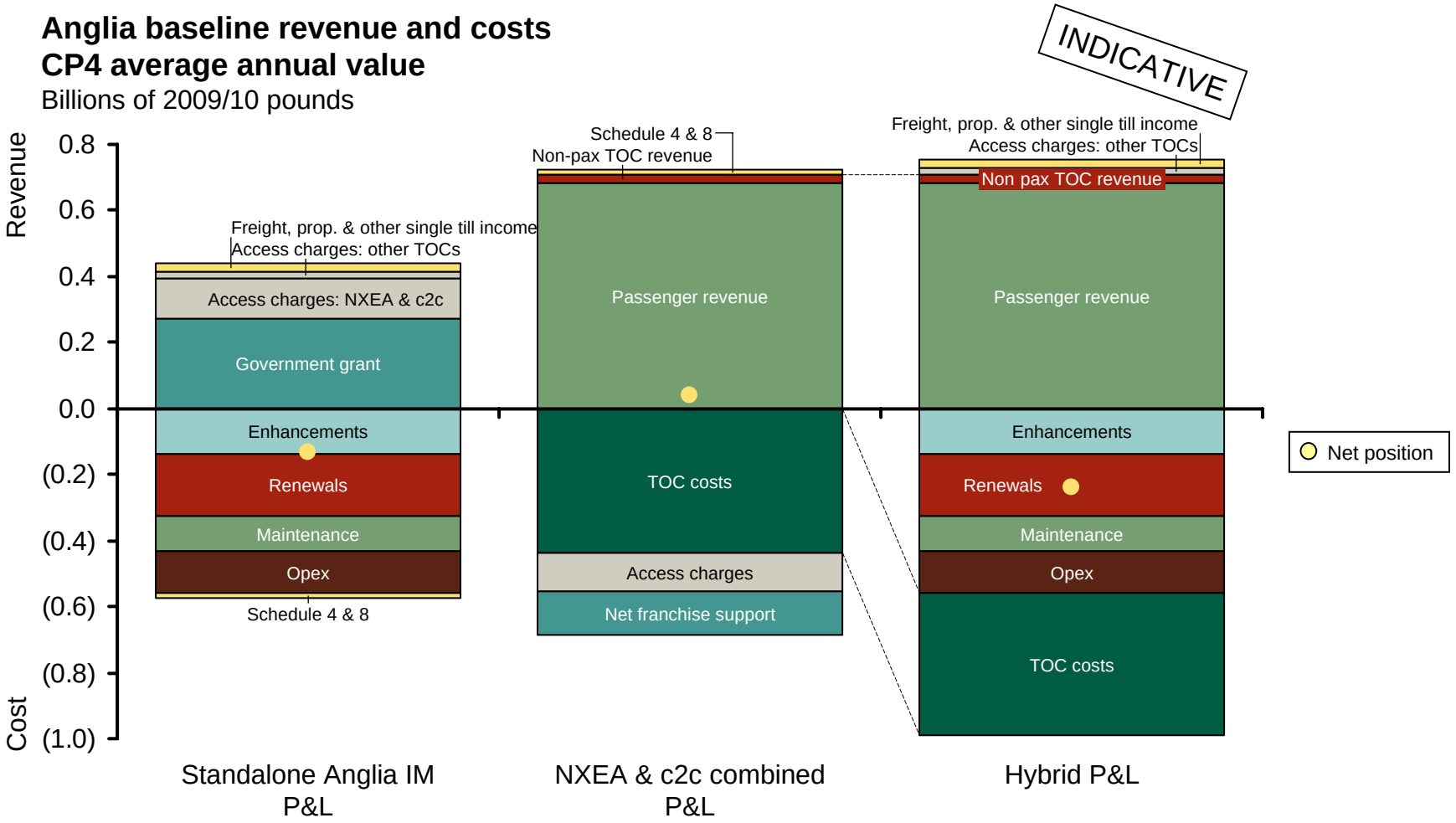
- NXEA is dominant in terms of train kms (65%) and has the majority of train movements (55%)
- NXEA and c2c combined make up 78% of train kms and 68% of train movements
- NXEA is the only scheduled operator at Liverpool Street station (except for two late evening c2c services) and is the only passenger operator on the two principal routes into this station:
  - Great Eastern Main Line (Liverpool Street – Norwich)
  - West Anglia (Liverpool Street – Stansted Airport/Cambridge) – although CrossCountry shares the route with NXEA beyond Stansted
- NXEA and c2c are the SFO at most of the stations they serve
- There are significant freight flows, principally to Felixstowe and North Thameside. Development of effective protection for existing and potential freight movements is critical for implementation of vertical integration in the region
- The Anglia Region includes the North London Line (NLL) between Stratford and Richmond, with significant short distance train movements for LOROL and LUL District Line (23% of train movements), but the NLL passenger operation is effectively self contained, with no overlap with NXEA passenger services
- Other TOCs operate Stansted –Peterborough (Cross Country), Cambridge – Kings Lynn (FCC) and Norwich – Peterborough (EMT), but these are less busy parts of the network

The Anglia region is covered by three Infrastructure Maintenance Delivery Units



Note: *Richmond managed by SWT, Liverpool Street and Fenchurch Street managed by Network Rail

A vertically integrated Anglia business would have annual revenue of c.£0.75bn and costs of c.£1.0bn



Source: DfT; ORR; NR; L.E.K. analysis

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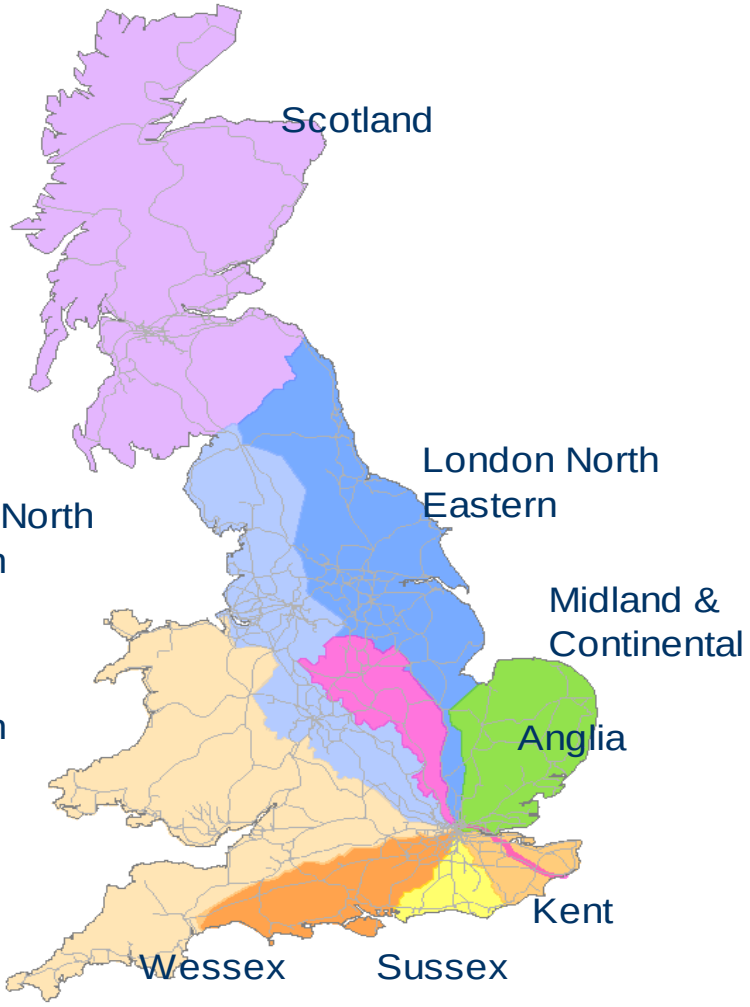
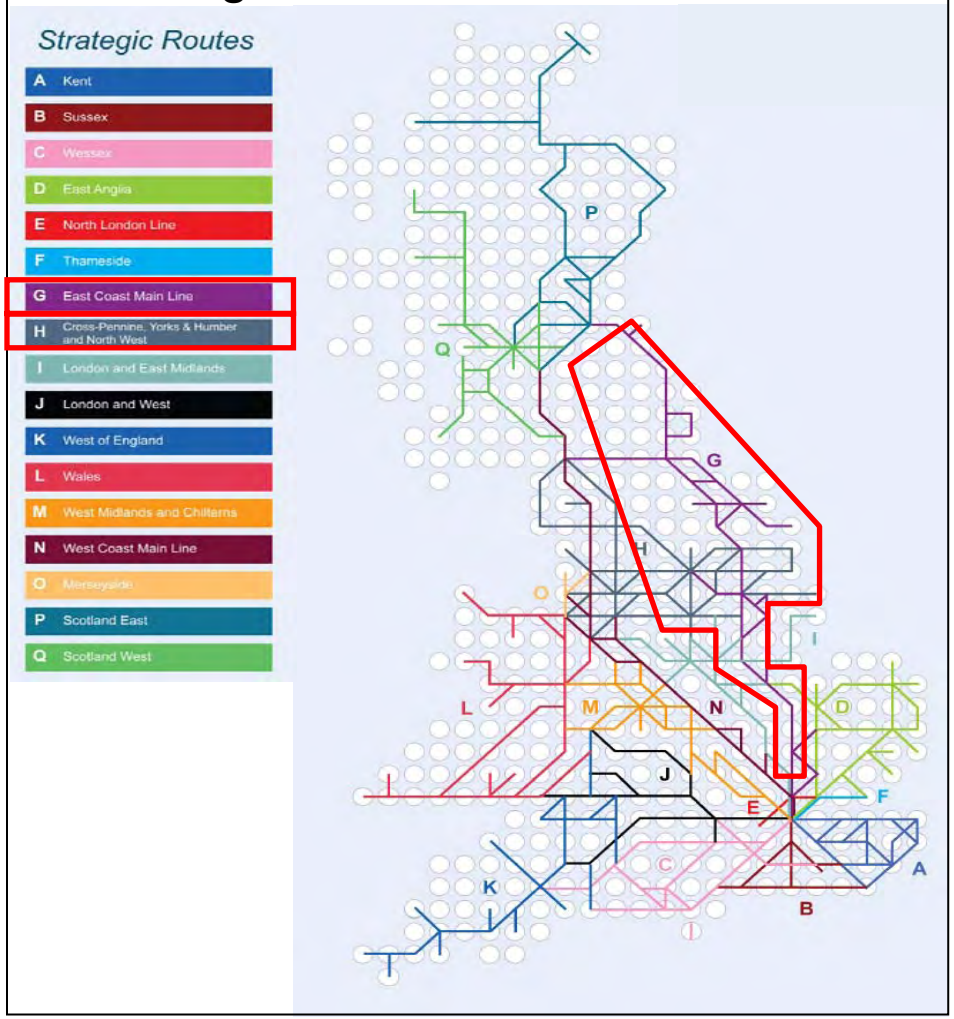
The LNE case study covers the area included in NR's LNE Operating Route. This includes the East Coast Main Line Strategic Route and part of Cross-Pennine, Yorks & Humber and North West Strategic Route

NR operating routes



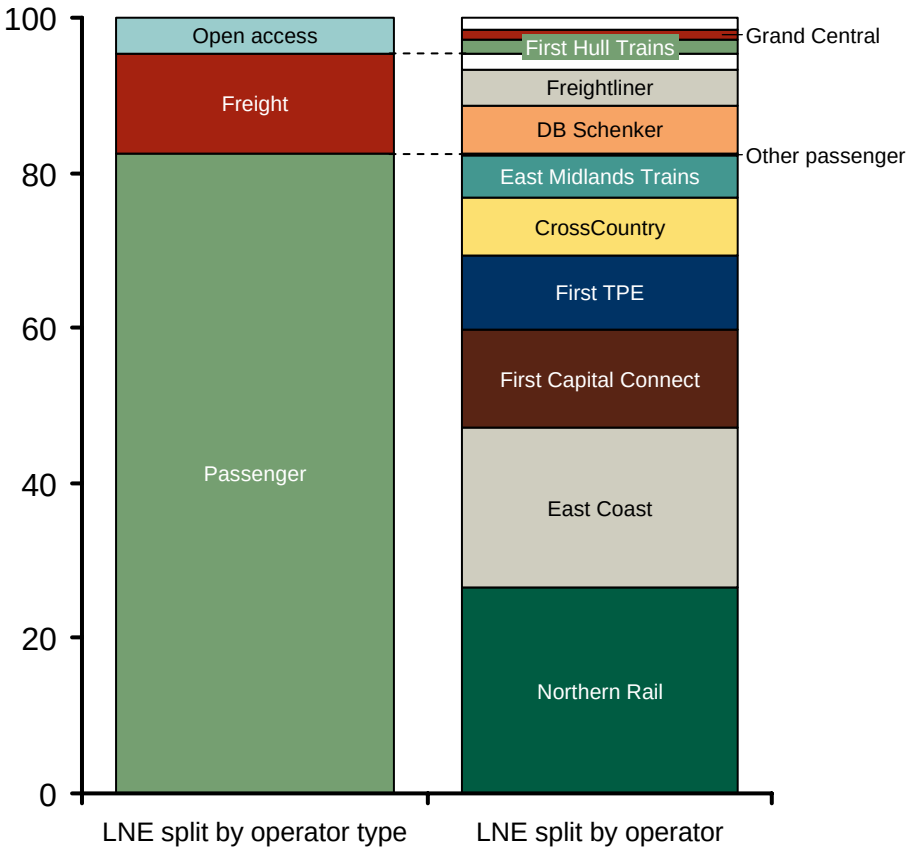
NR strategic routes



LNE is a multi-use route with the largest operator, Northern Rail, only accounting for 27% of the total train kms. Freight accounts for 13% and open access passenger operators a further 5%

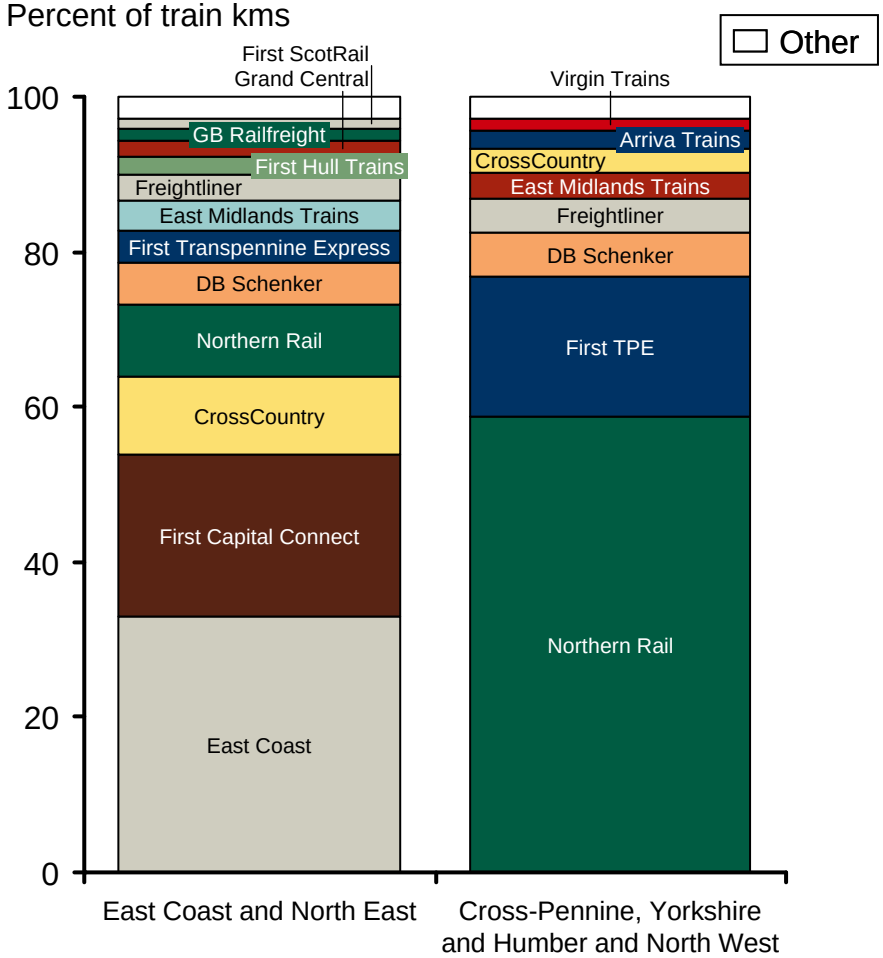
LNE's train kms by operator type

Percent of train kms



Split of LNE's two main strategic routes

Percent of train kms

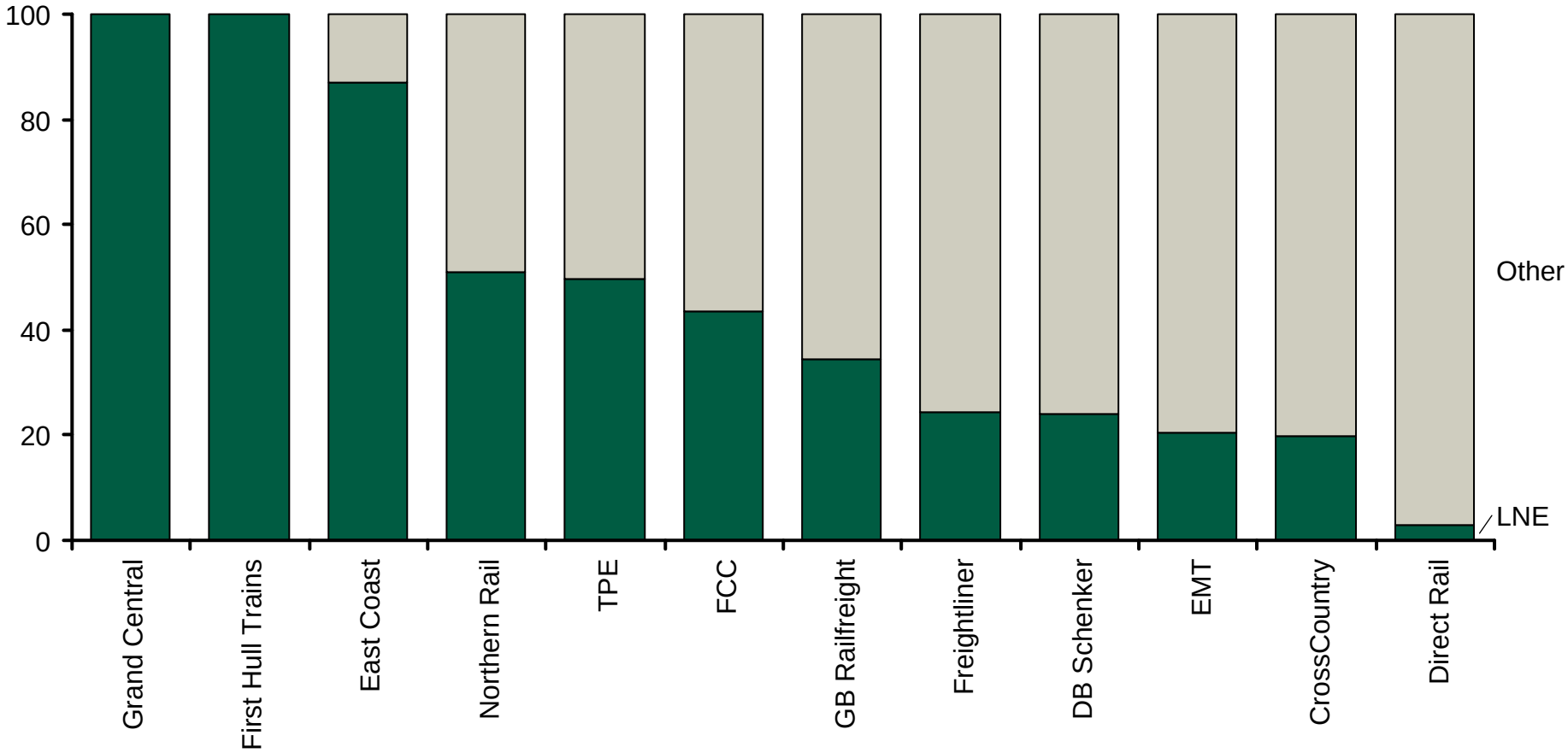


Source: NR; L.E.K. analysis

Only Grand Central and First Hull Trains have all of their services within the LNE Operating Route

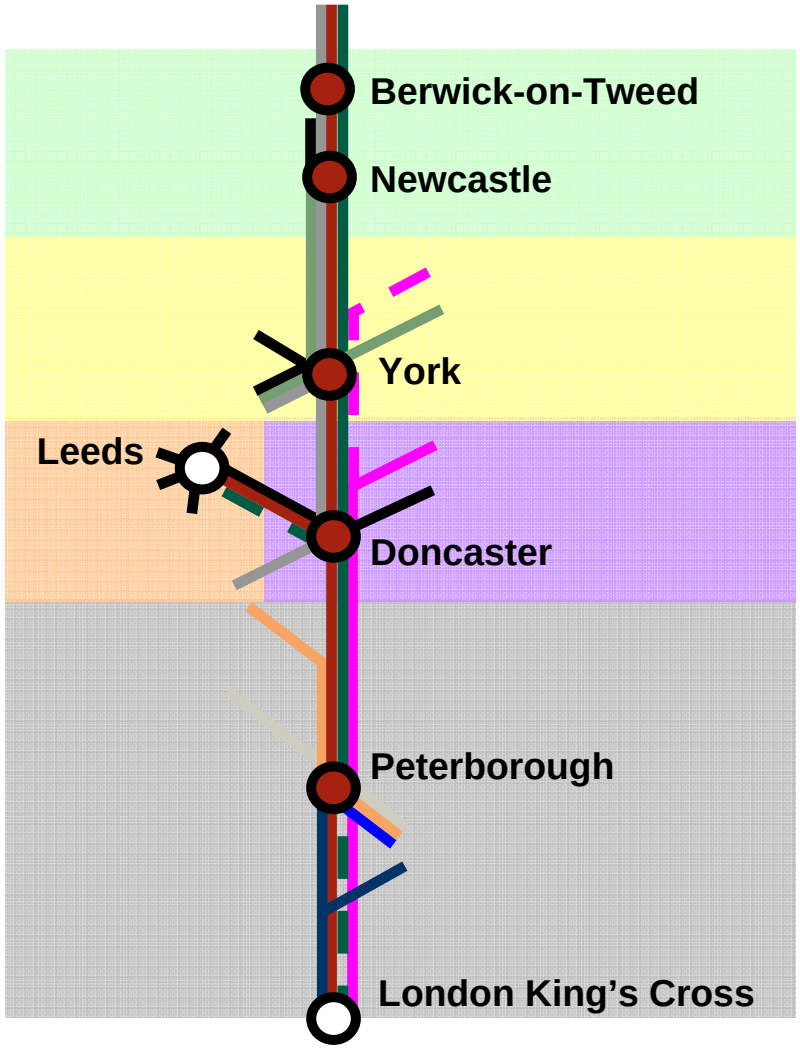
Operators' total train kms split by operating route

Percent of train kms



Source: NR; L.E.K. analysis

There are multiple operators along the whole length of the East Coast Mainline



- East Coast
- First Capital Connect
- Arriva Cross Country
- Open access operators (First Hull Trains, Grand Central)
- First TransPennine Express
- East Midlands Trains
- Northern
- Freight
- Colour indicates manager of station*

Dashed lines indicate limited operation

- Newcastle IMDU
- York IMDU
- Doncaster IMDU
- Leeds IMDU
- Hitchin IMDU

Note: *King's Cross and Leeds managed by Network Rail

Views from the LNE workshop

- This is a complex, multi-use route
- All participants recognised that there is no single dominant operator
  - There was concern that Railtrack/Network Rail had in the past tended to be too close to GNER
- There was some support for creation of a Network Rail "Northern" region, made up of secondary routes from LNE and LNW
  - Greater alignment with First TransPennine Express and Northern Rail
  - Improved focus on project development and infrastructure cost management in the Northern Rail area
- There was some nervousness about the impact of bespoke deals between, for example, Network Rail and East Coast. Other TOCs and FOCs saw a risk that their interests would be secondary
- There was support for devolution within Network Rail, but no support for independent ownership of Regional IMs or vertical integration on this geography, at least in the short/medium term

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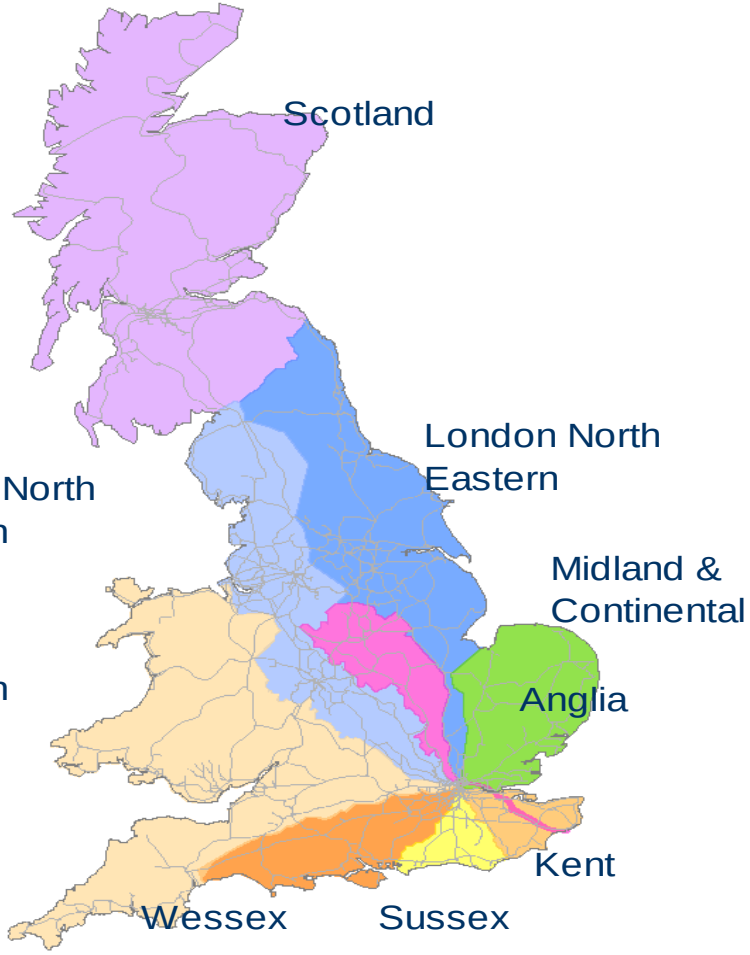
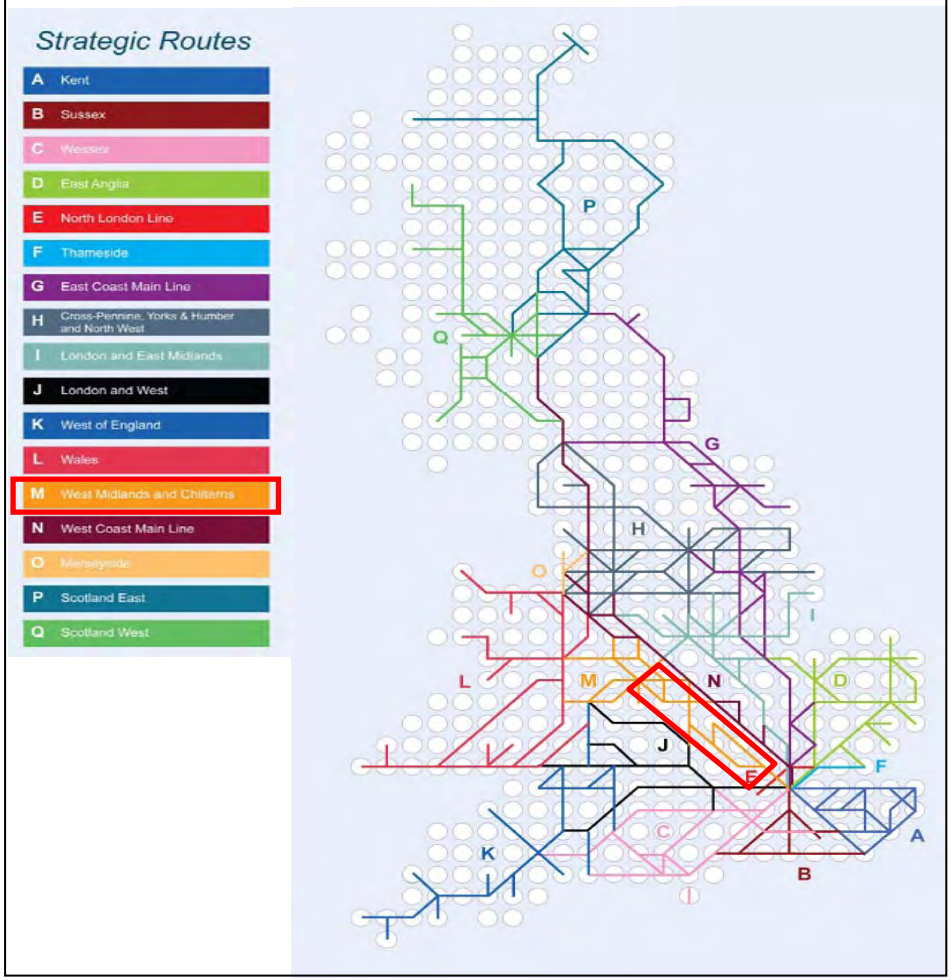
The Chiltern case study covers the main operating routes of Chiltern Railways. This falls within the LNW operating route and is a subset of the West Midlands and Chilterns Strategic Route (1 of 2)

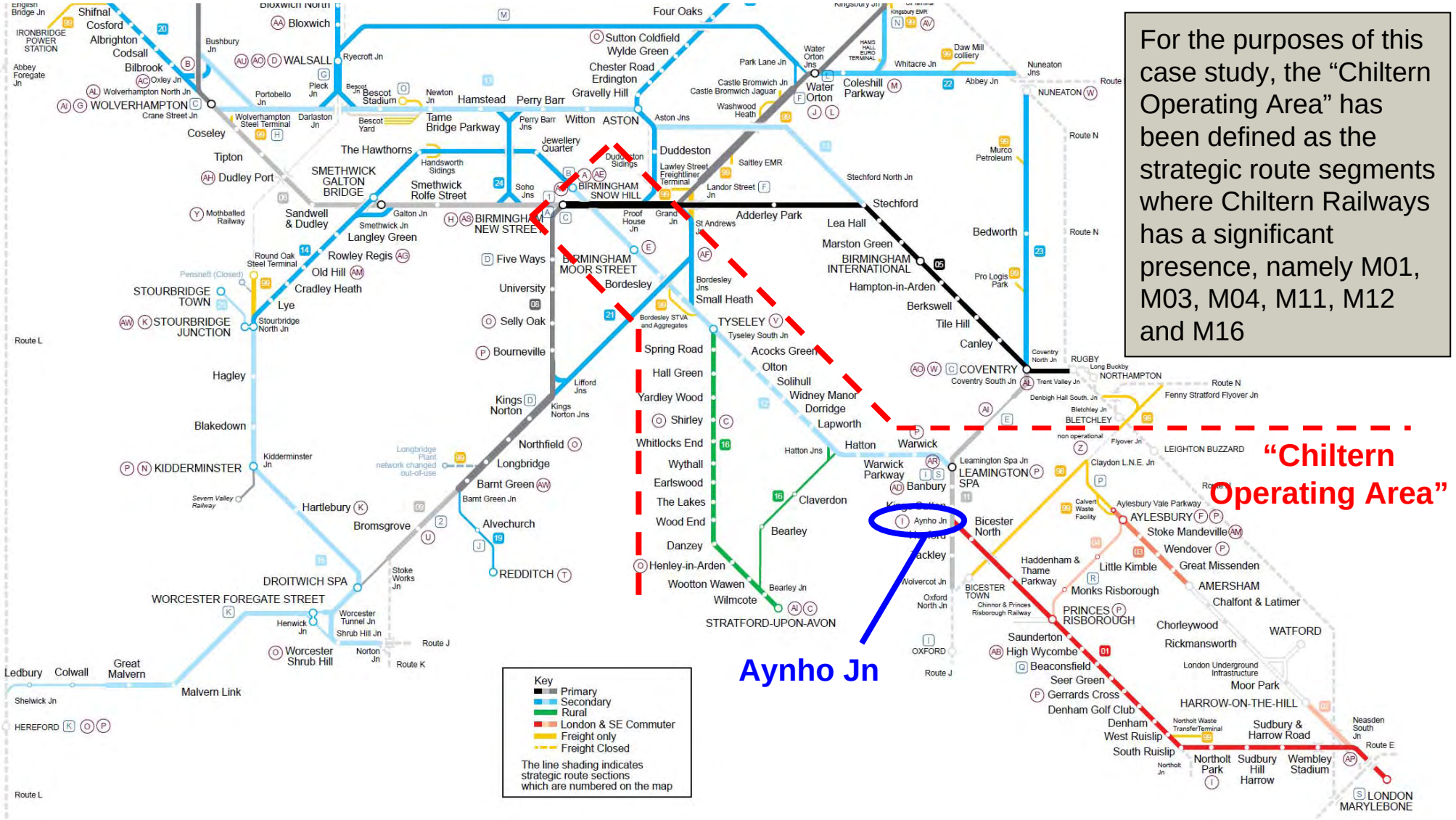
NR operating routes



NR strategic routes



The Chiltern case study covers the main operating routes of Chiltern Railways. This falls within the LNW operating route and is a subset of the West Midlands and Chilterns Strategic Route (2 of 2)

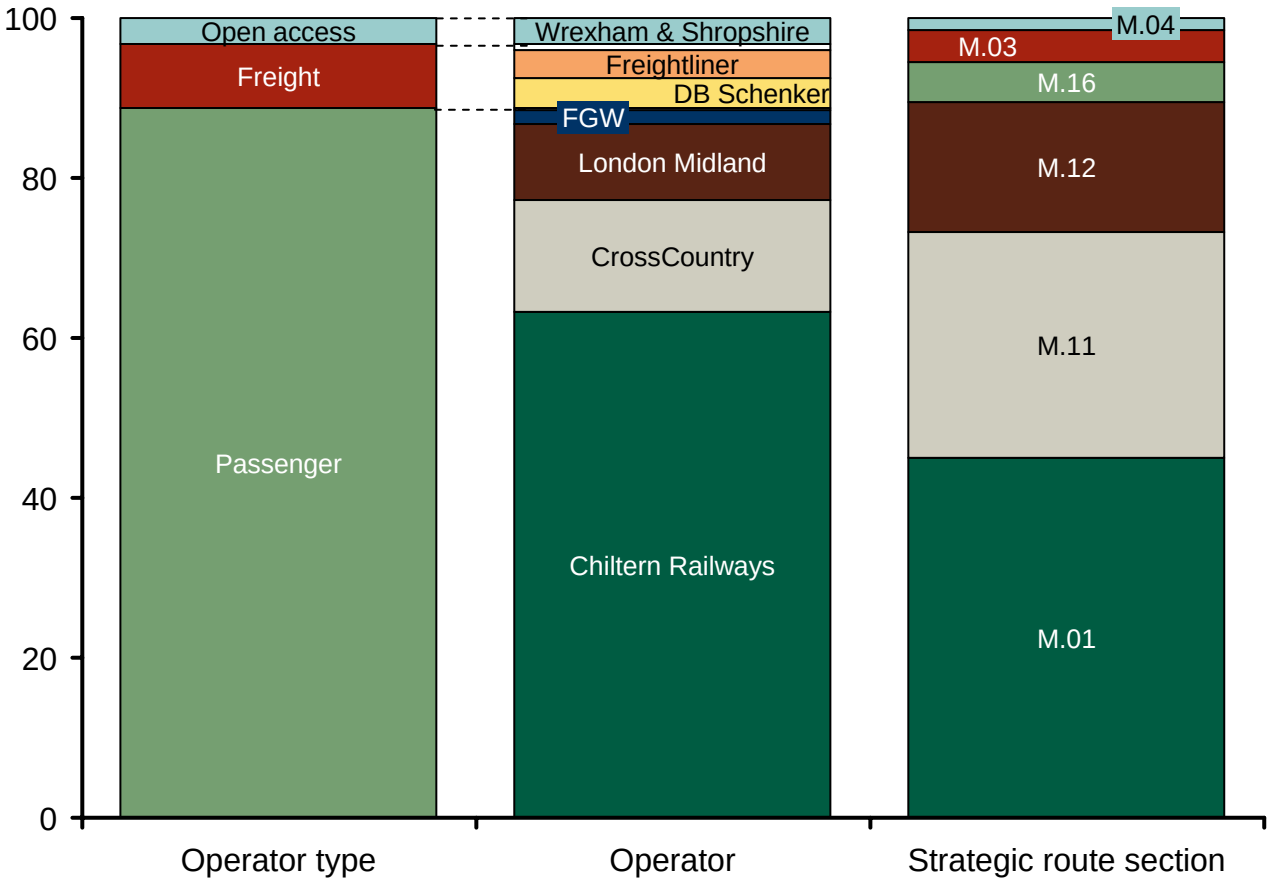


For the purposes of this case study, the "Chiltern Operating Area" has been defined as the strategic route segments where Chiltern Railways has a significant presence, namely M01, M03, M04, M11, M12 and M16

Chiltern Railways accounts for two thirds of the train km in the Chiltern operating area…

Chiltern operating area split of train kms

Percent



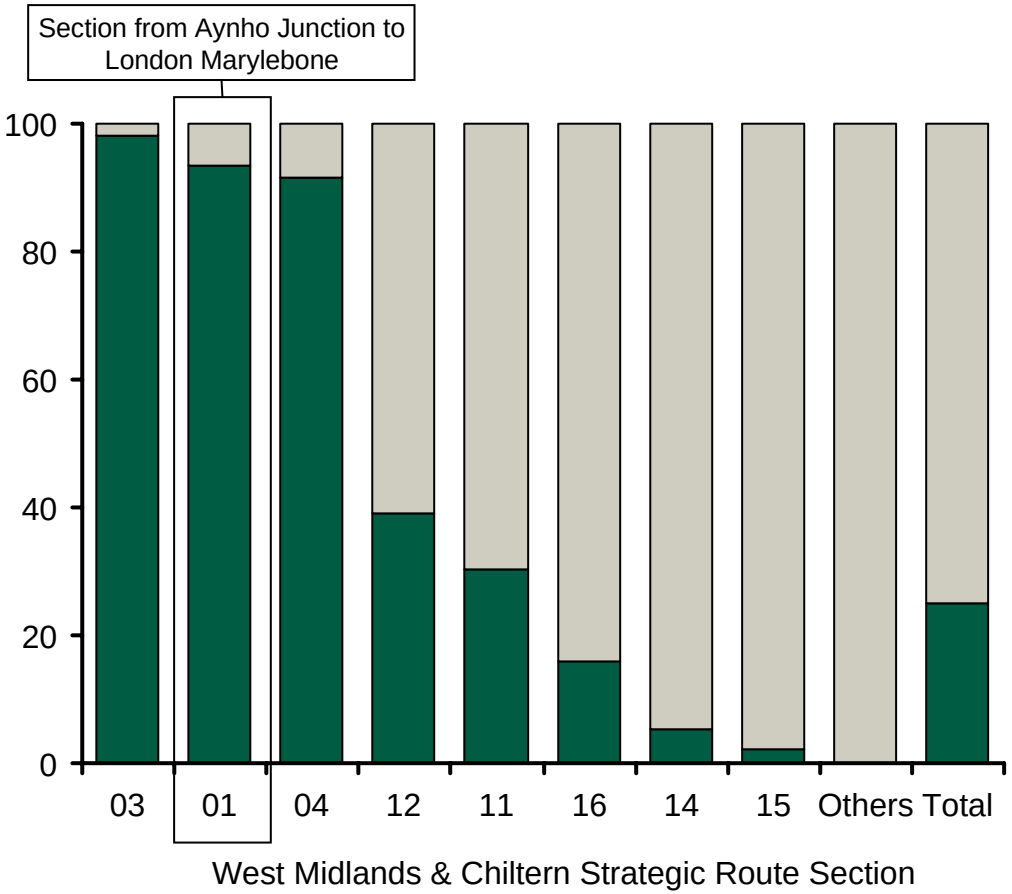
Note: * Freight includes commercial freight, engineering/infrastructure, charter and other e.g., railhead treatment, measurement

Source: NR; L.E.K. analysis

…However, Chiltern Railways accounts for c. 90% of the train km from Aynho Junction to London Marylebone

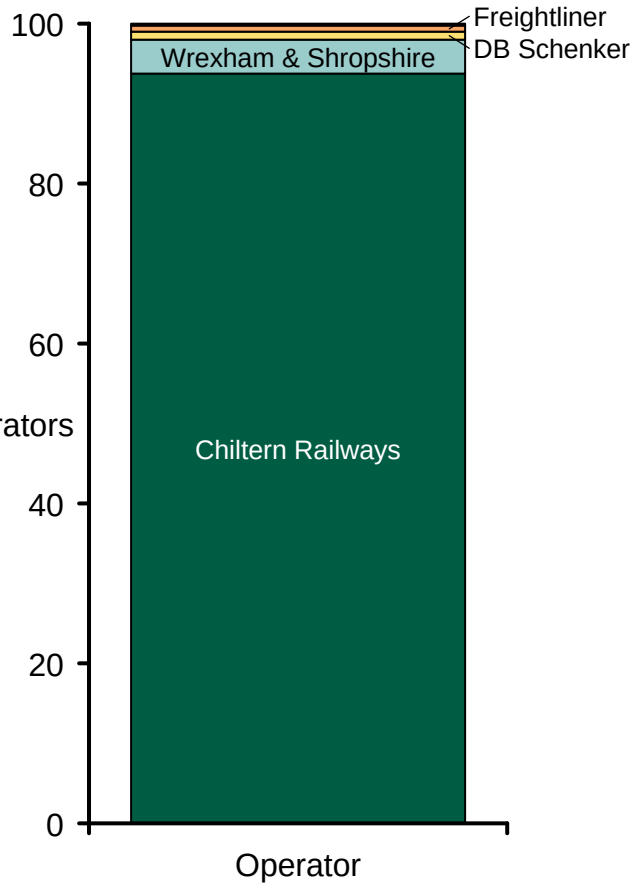
Chiltern Railways share of train kms on West Midlands & Chiltern Strategic Route Sections

Percentage of train kms



Aynho Jn to London Marylebone

Percent of train kms

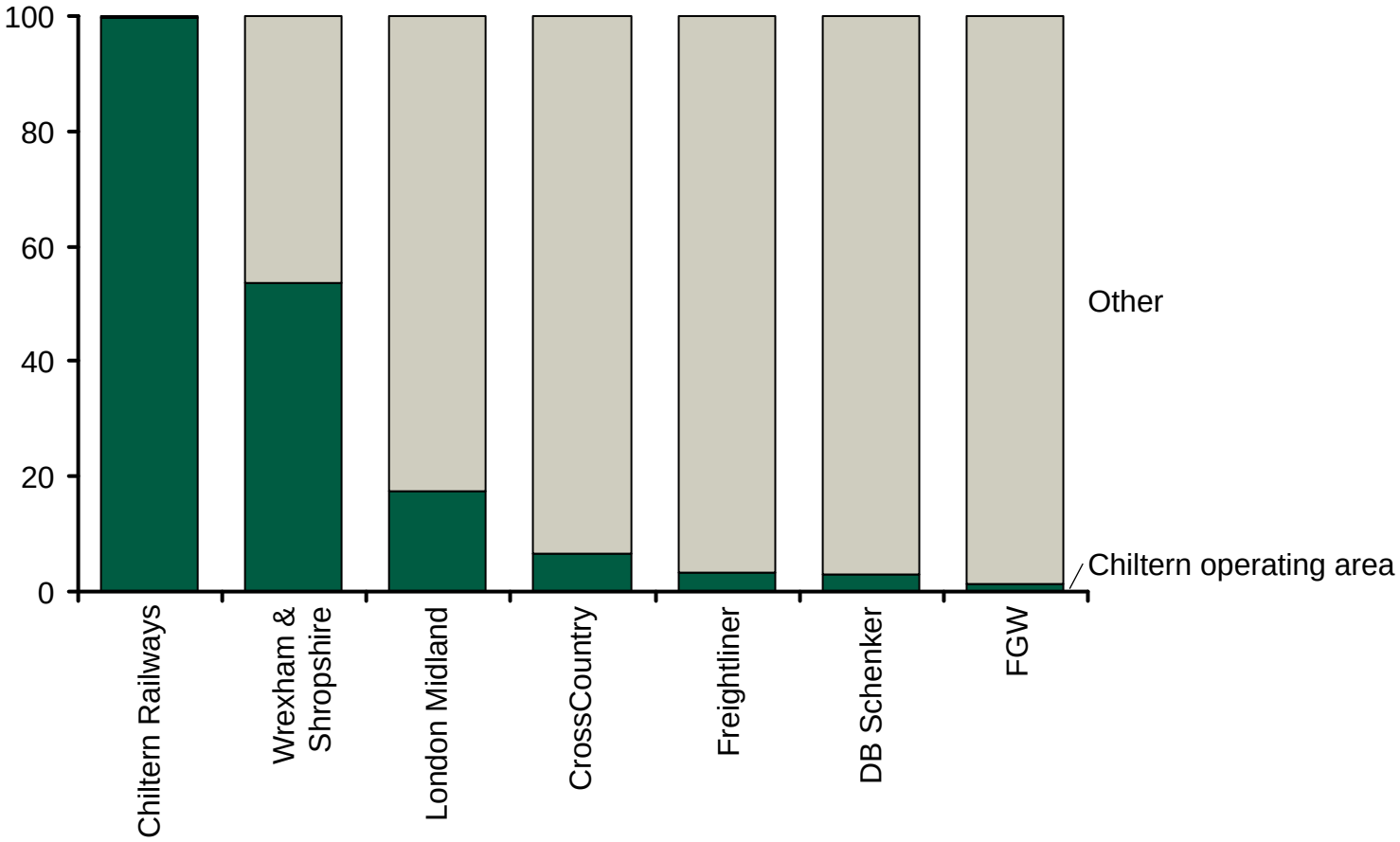


Source: NR

The Chiltern Operations Area accounts for a small proportion of the total train kms of most operators who use the area

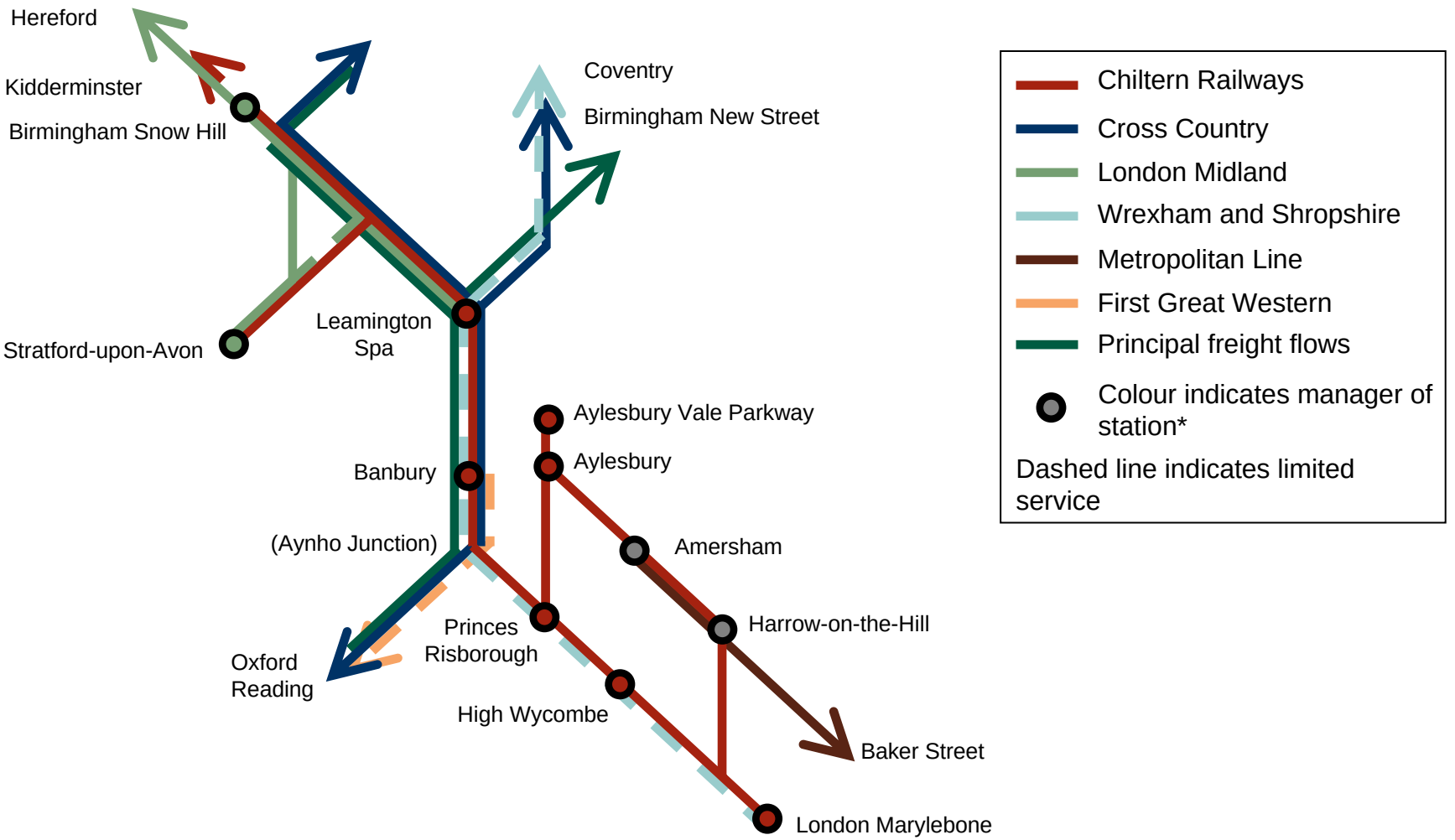
Operators' total train kms split

Percent of train kms



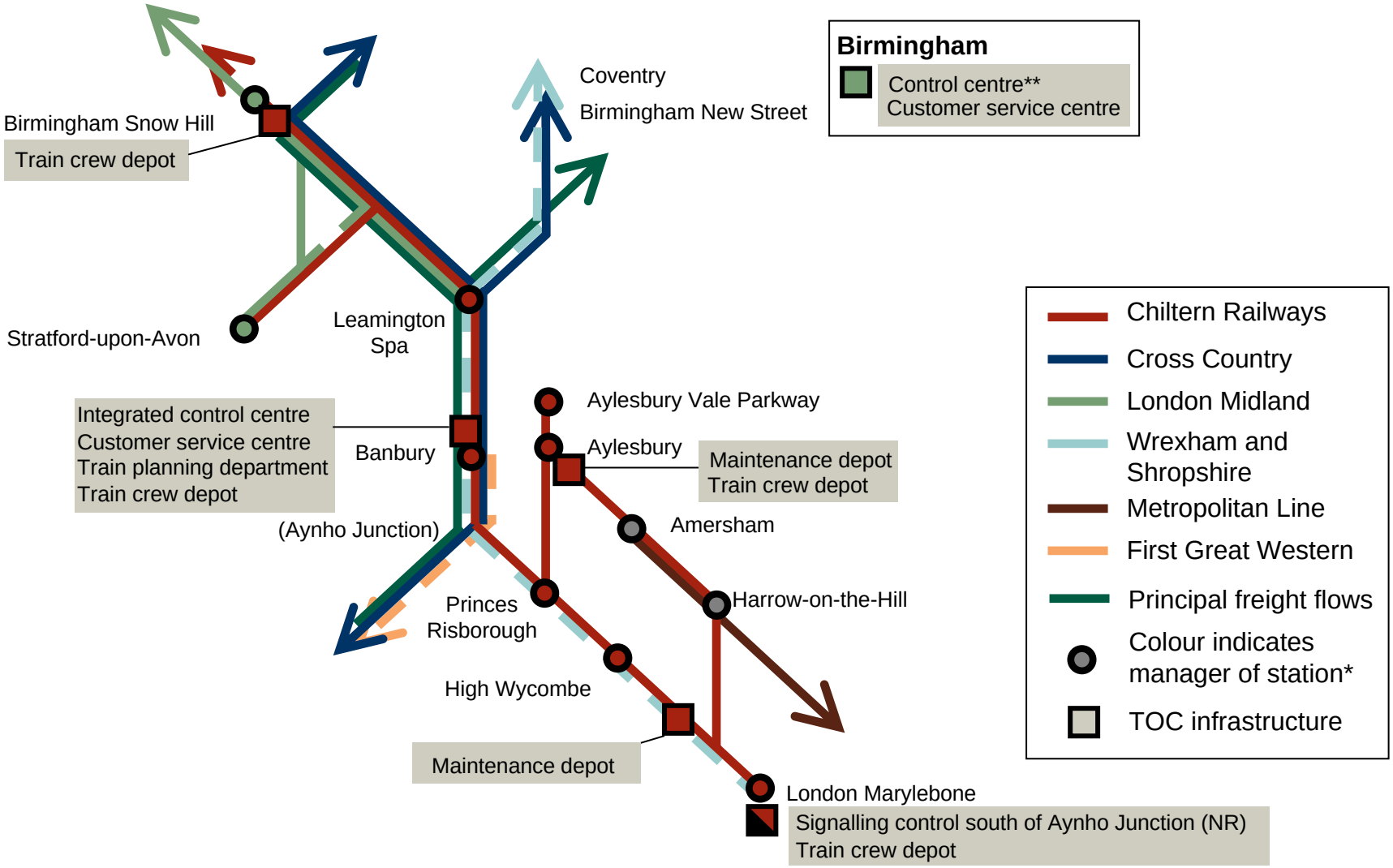
Source: NR; L.E.K. analysis

While Chiltern Railways dominate services south of Aynho Junction, North of Aynho Junction their services operate on multiple user infrastructure



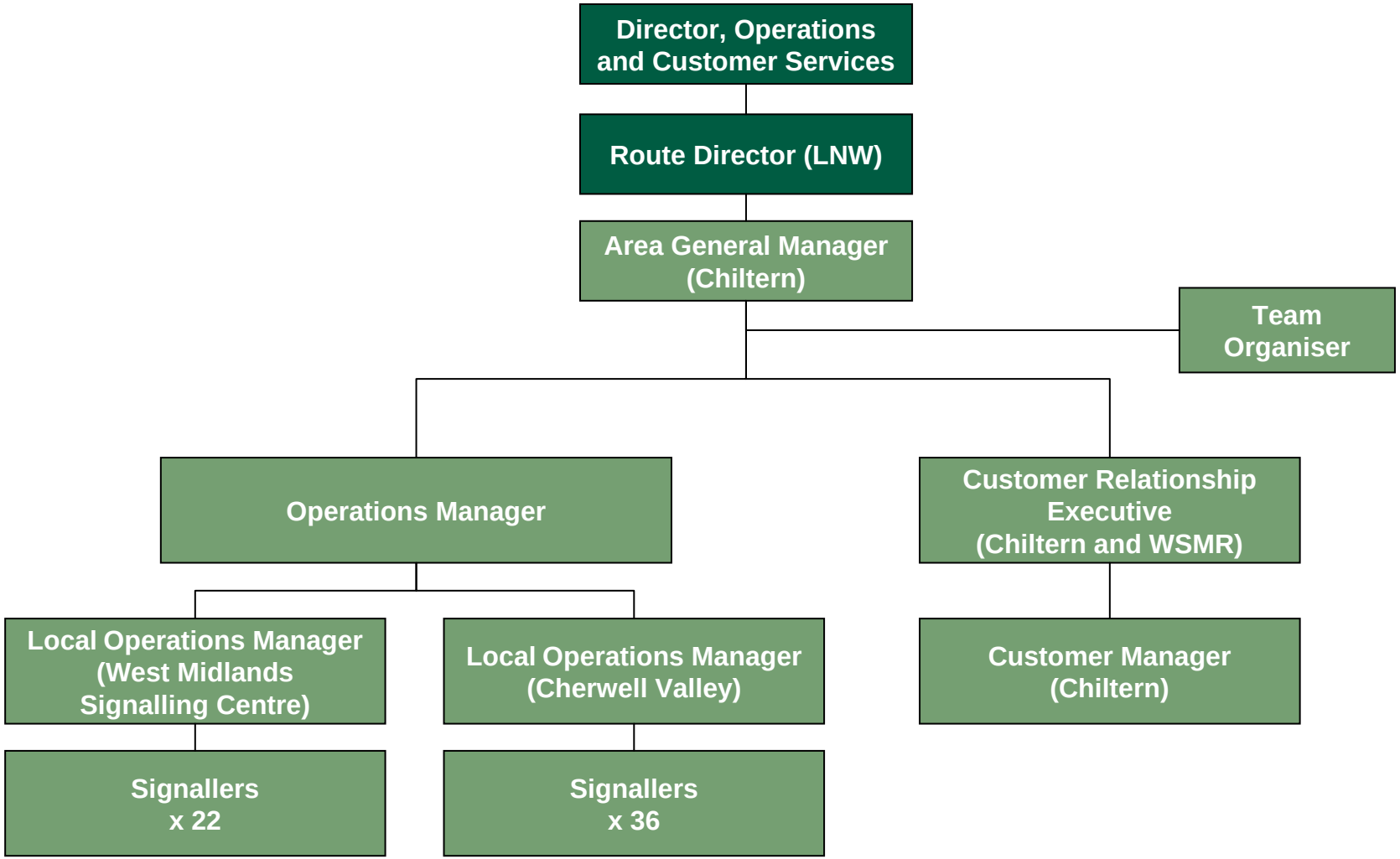
Note: *London Underground marked in grey

Chiltern's key facilities are at locations across its network. Network Rail, London Midland and Cross Country operate a joint control centre in Birmingham



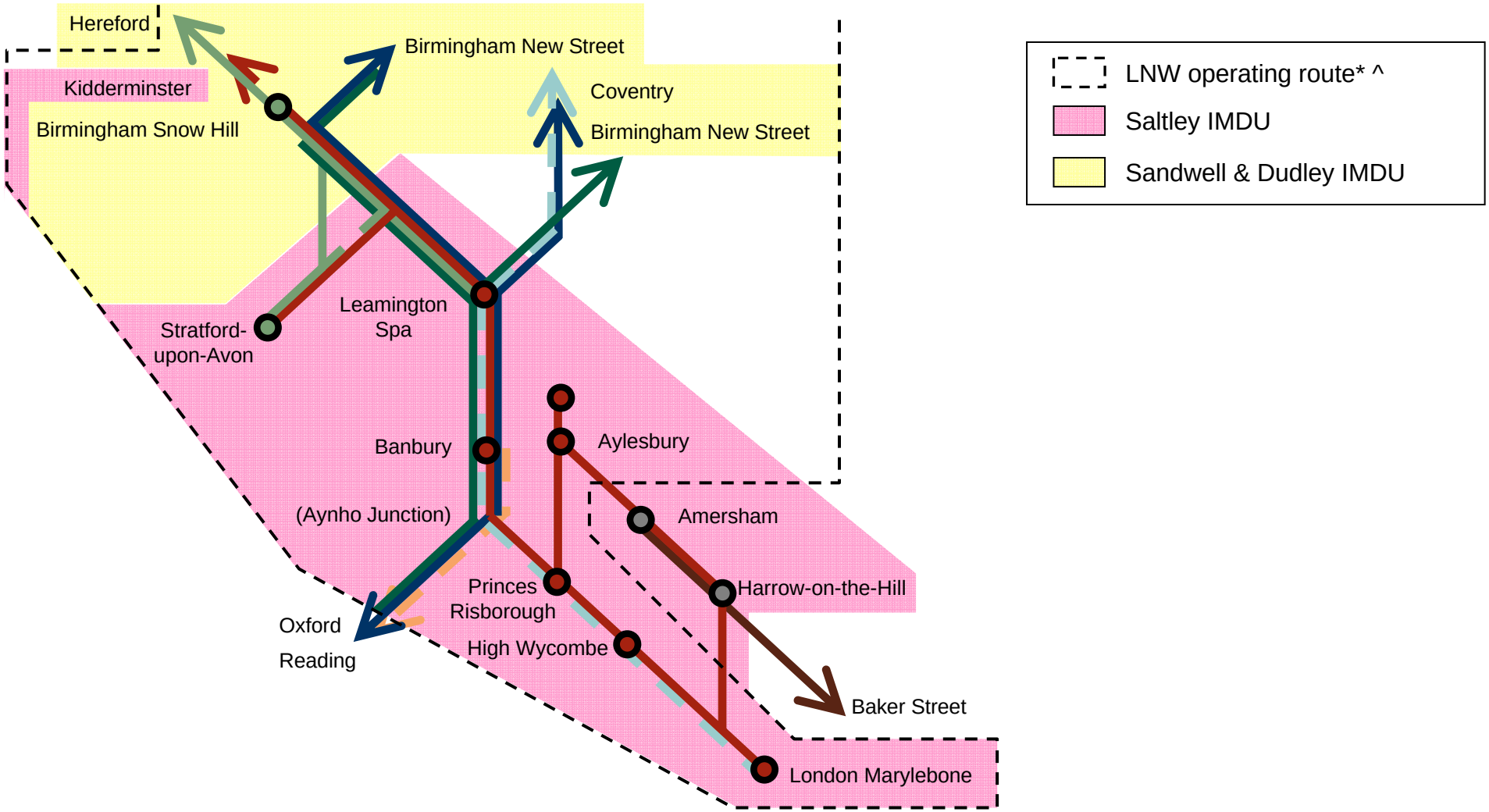
Note: *London Underground marked in grey; ** Joint Network Rail, London Midland and Virgin West Coast Control Centre

Network Rail's operations organisational chart for Chiltern Operating Area



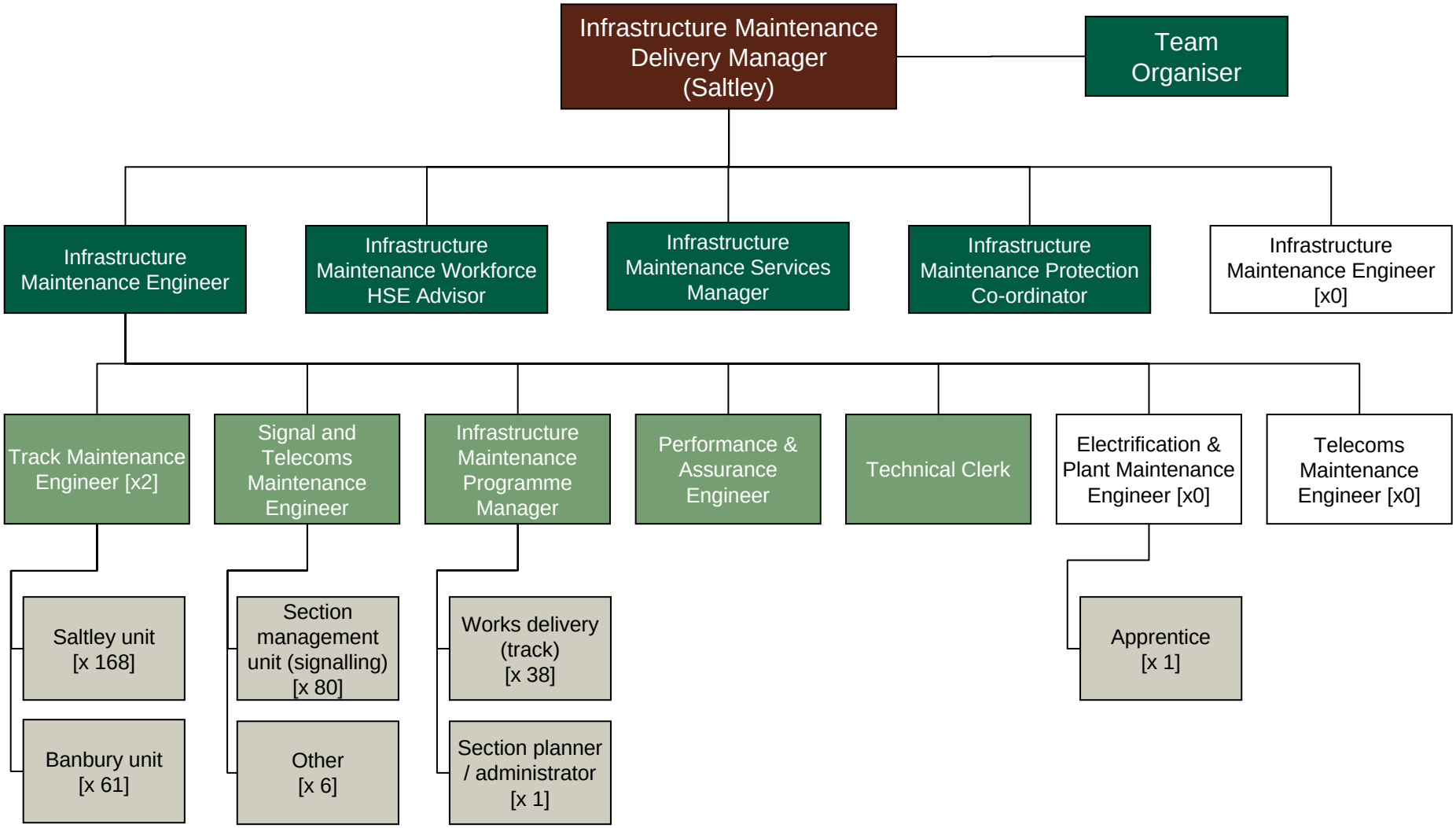
Source: NR

The Chiltern operating route is mainly covered by the Saltley Infrastructure Maintenance Delivery Unit. However, the northern end of the route is covered by the Sandwell and Dudley IMDU



Note: *LNW covers a far broader geography than the area shown; ^For the area illustrated, this is the same boundary as the West Midlands and Chiltern strategic route

Network Rail's organisational chart for the Saltley Maintenance Delivery Unit



Source: NR

Views from the Chiltern workshop

- Agreement that Chiltern is overwhelmingly dominant south of Aynho Junction – although there are some open access services and some limited freight movements. This is not typical for the network as a whole
- The section south of Ayhno Junction is a small area so there may be diseconomies of scale. It is significantly smaller than the Saltley IMDM area
- Incident recovery (MOMS) is shared with south end of the West Coast Main Line
- Chiltern Railways are very keen to evaluate initial horizontal separation, then a vertical alliance JV for the route south of Aynho Junction. Chiltern argued a number of benefits:
  - Elimination of man marking
  - Improved incident recovery , for example, training TOC station staff to wind and clip points, so reducing delays
  - Better alignment of revenue and infrastructure spend
  - Improved possessions strategy
  - Faster, more focussed project development
  - Scope for local innovation
- The workshop did not support horizontal separation or vertical integration for the Aynho Junction – Birmingham section
  - A multi-user route
  - Important for freight: a key part of the Southampton – Midlands/North intermodal corridor
  - Would create new interfaces and significantly complicate management for network operators (Cross Country and freight)

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Conclusions from the case studies

Anglia

- The major passenger operations (NXEA and c2C) are largely self contained, with only a single passenger operator over the principal main lines and at the London terminals
- Other TOCs operate over the network, but either on less busy infrastructure (FCC, Cross Country, East Midlands) or over a self contained route in terms of passenger operation (LOROL, LUL)
- The geography and franchise timescales make Anglia a strong candidate for an initial vertical integration area
- But effective protection for existing and potential freight flows is vital

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LNE

- Devolution within Network Rail ownership should increase alignment with operators and potentially deliver reduced cost and increased revenues
- Given the complex multi-use nature of the route, horizontal separation with independent ownership or deep vertical alignment/integration are not appropriate for the short/medium term
- Creation of a separate “Northern” region would give greater alignment with Northern Rail and First TPE, give an effective focus on the costs of secondary route infrastructure, and improve development and delivery of local projects

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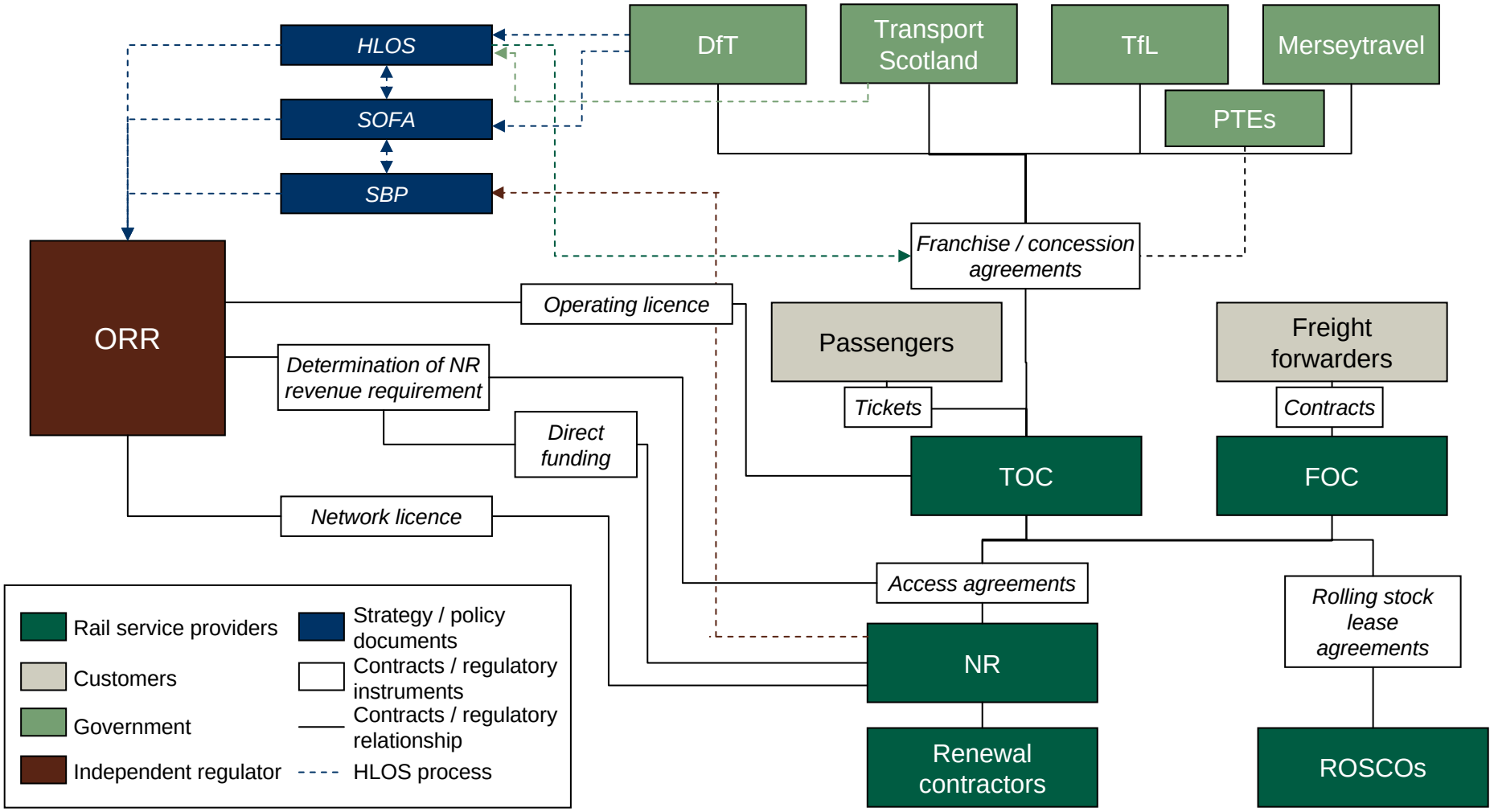
Chiltern

- The southern end of the Chiltern route is very self contained and could provide a useful pilot for horizontal separation and then a vertical alignment JV
- But the infrastructure is small scale and there may be initial diseconomies of scale
- Given the small scale of the region it is also unlikely to provide useful benchmarking for other parts of the network
- The region is atypical and would provide no effective test of safeguards for secondary users on day to day prioritisation, capacity allocation and timetabling or interface issues for network operators

Agenda

- Executive summary
- Introduction
- Horizontal separation
- Vertical integration
- Vertical alignment
- Cost and revenue sharing
- Implementation
- Appendix
  - Stakeholder consultation programme and documents reviewed
  - Financial baseline and option impact quantification
  - Regional case studies
  - Review of existing arrangements

The GB rail sector is relatively complex. It comprises a large number of public and private sector organisations which interact through a complex set of contractual, regulatory and governance arrangements



This section of L.E.K.'s presentation is not intended to a comprehensive description of the current GB rail industry arrangement. Instead, it summarises the key features of the existing arrangements that have greatest bearing on alternative rail industry structures

Organisations and their governance arrangements
Passenger train operators
Freight train operators
Network Rail

Cross industry processes
On the day operations
Capacity allocation and timetabling
Long term planning and enhancements
Asset management, access management and delivery of MRE
Stations and depots
Rolling stock selection

Passenger train operators: There are 19 franchised passenger rail operators and a further 4 open access passenger rail operators. All operators are private sector except East Coast which is temporarily in public ownership

Passenger rail franchises

Logo	Operator	Owning group
First Capital Connect	First Capital Connect	FirstGroup (TPE in JV with Keolis)
First Great Western	First Great Western	
First TransPennine Express	First TransPennine Express	
ScotRail	ScotRail	
London Midland	London Midland	Govia
southeastern	Southeastern	
Southern	Southern	
East Midlands Trains	East Midlands Trains	Stagecoach
South West Trains	South West Trains	
Merseyrail	Merseyrail	Serco / Abellio
northern	Northern	
c2c	c2c	National Express
national express	NXEA	
crosscountry	Arriva Cross Country	Arriva
ARRIVA Trains Wales	Arriva Trains Wales	
Chiltern Railways	Chiltern Railways	Deutsche Bahn
LOROL	LOROL	Deutsche Bahn / MTR
Virgin trains	Virgin Trains	Virgin / Stagecoach
EAST COAST	East Coast	UK Government

Open access operators

Logo	Operator	Owning group
eurostar	Eurostar	Eurostar Int.
First Hull Trains	First Hull Trains	FirstGroup / Renaissance Trains
GRAND CENTRAL	Grand Central	Grand Union Railway
Heathrow express	Heathrow Express	BAA Ltd.

Passenger train operators: The franchising system has changed a number of times since privatisation. The current system is based on tightly specified 7-10 year franchises but the DfT has announced its intention to move to longer, more flexible franchises

Privatisation to 2003

The initial franchises started on various dates in 1996/97 with franchise terms of 7 to 15 years

The longer durations were typically granted where the rolling stock fleet was to be replaced

The franchises included Passenger Service Obligations which specified the minimum service provision. This left scope for operators to run additional services

A number of franchises were re-let prior to 2004 based on a range of different franchising models

2004 to 2010

The SRA introduced a new franchising approach in 2004. Key features included:

- 7-10 year franchise terms with the final 2-3 years subject to achieving performance targets
- Prescriptive train service specifications which left operators with relatively little flexibility over the timetable
- Revenue share and support mechanism
- Franchises awarded based on NPV of base case subsidy / premium provided that bidder meets deliverability threshold

The DfT continued with this approach when it took over responsibility for rail franchising

2011 onwards

The DfT announced the conclusions of its review of franchising policy in Dec 2010 and Jan 2011

- Longer franchises of 15 to 22.5 years duration
- Less detailed specifications
- Residual value mechanism to encourage private sector investment
- Single party responsible for stations management
- Franchisee either takes all revenue risk or DfT shares risk through link to macroeconomic factors (e.g. GDP)
- Profit share mechanism
- Consideration of a review mechanism to re-set important elements of longer franchises

Many of the details of the DfT's new approach are still unclear as they will be developed on a franchise-by-franchise basis

Freight train operators are open access users of the network and pay only variable charges

- After a long period of decline, the amount of freight carried by the railway started to grow in the mid-1990s
  - several factors have driven this growth, including increasing road congestion and growth in certain sectors such as larger distance movements of imported coal, which rail is particularly well placed to carry
  - rail's quality of service has also improved, driven by competition and investment
- Competition between road and rail has always been strong, and competition within the rail industry between different operators has intensified
  - the position is further complicated by the nature of the freight market, where service providers need flexibility to respond to customer demand, which can vary at short notice. This means that NR's timetable planning must allocate more space for freight than is actually used on a day-to-day basis
  - rail is most competitive for high-volume flows over longer distances, and tends to become less attractive as volume and distance decline
- There are currently four major FOCs: DB Schenker, Freightliner, GB Railfreight and Direct Rail Services
- All FOCs are open access users of the network
- FOCs pay variable access charges but not fixed charges
  - EU legislation requires access charges to be based on short run marginal cost plus a mark-up value where the market can bear it. In the case of freight, the mark-up only applies to the coal and nuclear markets and is applied to the variable access charge
- FOCs also pay a coal spillage charge, a capacity charge and EC4T
- FOCs receive flow specific freight grants from the Government (£21m in 2008/09)

Source: DfT, "Delivering a Sustainable Railway"; ORR, Periodic Review 2008; ORR, National Rail Trends 2009-10 Yearbook

Network Rail is the owner-operator of the national network

- NR is the monopoly owner and operator of the national rail network, including track, signalling, power, civils and stations
  - it was launched in Oct 2002 when it bought out Railtrack which entered administration in Oct 2001 (in large part a consequence of spiralling costs following the Hatfield crash and West Coast Main Line modernisation)
  - it took a far more centralised approach than Railtrack in order to regain control over the business
- NR has Company Limited by Guarantee (CLG) status, which means it operates as a private company but profits are reinvested in the network. It does not have any equity and all of its debt is currently guaranteed by government
- NR's board is accountable to about 100 members. It has two general classes of members: Public Members, who are drawn from the general public, and Industry Members from certain rail industry companies. In addition, the DfT is a member with special rights, such as to appoint a Director of NR (not currently exercised). A majority of the members must be Public Members
- NR's "members" based governance regime is widely considered to be ineffective

  "…Members with significant experience and interest in the industry were in close agreement that the current membership structure and approach is flawed. The views of the remaining members differed both from this view and from one another. The divergence of views between members interviewed seems to stem from a lack of consensus between members about their role. This is not conducive to the exercise of effective governance and suggests that there is a case for further review and potentially, some change to the current arrangements …"

  Network Rail: Membership aspects of governance, KPMG, August 2008

  "…There's clearly conflicts of interest in the structure as it is… This is a unique structure and, at the heart of it, accountability, we are being told, is by individual members of Network Rail. We are not sure that is that effective …"

  Evidence given to the Committee of Public Accounts for "Increasing Passenger Capacity", September 2010
- Regulation, monitoring and reporting by ORR is currently the main mechanism through which NR is held to account

  "…I have made up the accountability deficit with the increased licence conditions, the stronger, streamlined and simplified access contracts and many other things …"

  Tom Winsor, Rail Regulator, The Future of the Railway, House of Commons Transport Committee, March 2004

Source: NR; ORR; Gourvish, "Britain's Railways 1997-2005 - Labour's Strategic Experiment"

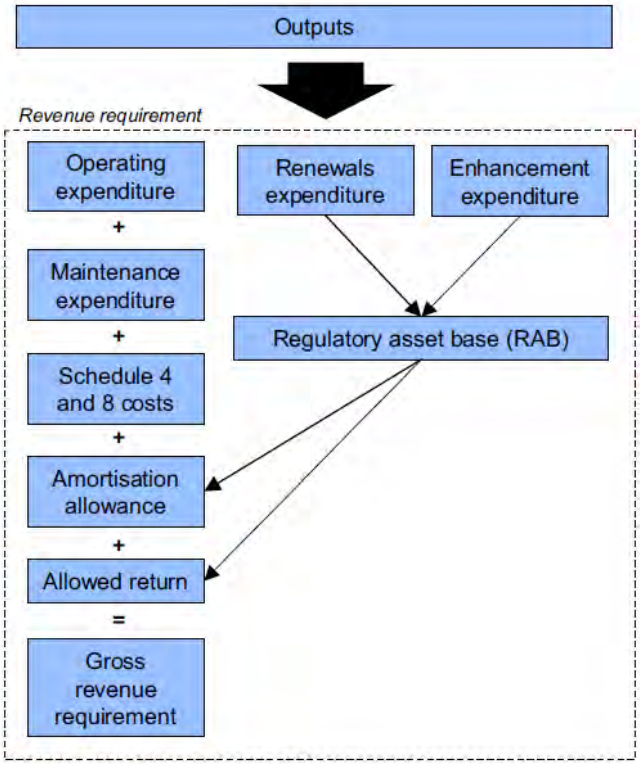
Network Rail's required outputs and funding for Control Period 4 were set by the ORR's 2008 Periodic Review

- The ORR's 2008 Periodic Review determined, for Control Period 4 (Apr 09 - Mar 14):
  - the outputs that NR must deliver and its revenue requirements
  - the track access charges to be paid by train operators for use of its infrastructure
- This was the first review since the passing of the Railways Act 2005, which introduced the process of the Secretary of State and Scottish Ministers issuing High Level Output Specifications (HLOSs) and Statements of Funds Available (SOFAs). This introduced the need for an understanding of whole industry costs and revenues
- NR's output obligations include:
  - top-level output obligations covering safety, train service performance, capacity, network capability, station condition and network availability
  - HLOSs targets for selected performance measures in 2013/14 and major specified enhancement projects
- The ORR carried out extensive work during the PR08 process to assess NR's efficiency. It concluded that there was a significant efficiency gap between NR and top quartile comparators, but that the range of uncertainty over the size of this gap was significant

  "…the efficiency gap given by the various studies lies in a broad range, with a central range of 30% to 50% …"
  PR08 determination
- The ORR analysed the rate of improvement achieved by companies in other regulated industries and made a high level judgement that "NR should be able to catch up two thirds of the efficiency gap during CP4"

Source: ORR, Periodic Review 2008

NR's capex on renewals and enhancements is added to its regulatory asset base (RAB). The RAB amortisation allowance and allowed return are used to calculate NR's revenue requirements



PR08 Expenditure assumptions

£m (2006-07 prices)	**CP4 total**
Opex	5,149
Maintenance	5,016
Renewals	10,760
Enhancements	7,612
Total expenditure	28,537

PR08 Revenue requirement

£m (2006-07 prices)	**CP4 total**
Opex	5,149
Maintenance	5,016
Schedule 4 and 8	712
Amortisation	7,290
Allowed return	8,561
Gross revenue requirement	26,728

- The amortisation allowance is based on long-run steady-state renewals expenditure (with a further small addition to amortise the non-capex additions made to the RAB at the start of CP4)
- NR will be provided with an allowed return for CP4 that reflects its risk-adjusted cost of capital, judged by the ORR to be 4.75% in real terms

Source: ORR, Periodic Review 2008

Network Rail will be provided with an allowed return for CP4 that reflects its risk-adjusted cost of capital. After meeting financing costs, this is split between a risk buffer and a ring-fenced investment fund

Components of allowed return

	Description	CP4 baseline total (£m)
Debt service	Actual expected cost of raising and servicing debt	5,061
Financial indemnity mechanism (FIM) guarantee fee	Fee payable to the DfT to reflect the long-run value of the credit quality enhancement received as a result of the FIM guarantee The FIM fee has been set at 0.8% of the outstanding FIM-backed debt	
Risk buffer	Enables NR to manage business risk and normal fluctuations in cash flow To the extent that NR does not use this risk buffer to meet fluctuations in cash flow, it has discretion over its use	1,040
Ring-fenced investment fund (RFF)	A ring-fenced investment fund which is earmarked to fund HLOS outputs except in instances where profits fall short of expected levels and NR decides that it needs to defer capex in order to finance its business	2,460

Source: ORR, Periodic Review 2008

NR's Management Incentive Plan for Executive Grades includes annual and long-term incentive components. The annual component rewards performance based on a range of measures

Weighting of bonus incentive measures (%)

			Executive Directors	Senior Executives	Other Senior Executives	Route based Executives
Annual incentive component	'Mechanistic' measures	Public Performance	20	15	15	10
		Asset Stewardship Indicator	20	15	15	10
		Cost Efficiency Index	20	15	15	10
		Passenger Satisfaction	20	15	15	10
	'Judgemental' measures	Customer Satisfaction	10	7.5	7.5	10
		Renewals Progress	10	7.5	7.5	10
	Additional measures used	Financial measure (specific to department)	-	25	25	-
		4 measures of local performance	-	-	-	10 each
Long term incentive component	Long term measures (3 year period)	Financial Value Added	Calculated based on the difference between ORR's determination and NR's actual income and expenditure			

Bonus as a percentage of base salary (%)

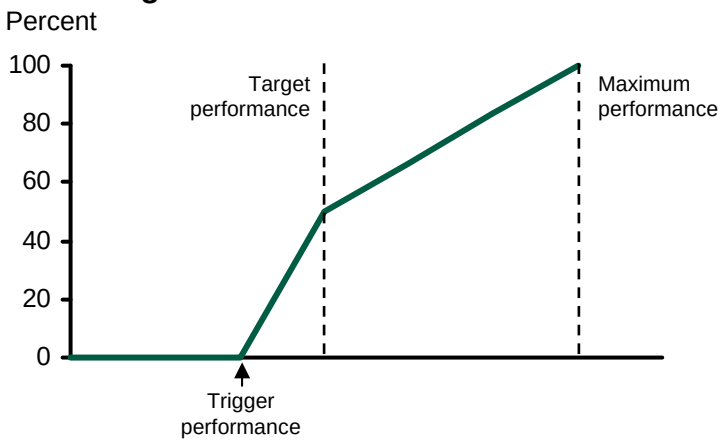
If NR meets target level for all measures	50	40	30	30
If NR meets maximum level for all measures	100	80	60	60
Number of eligible staff	6	8	25	13

Note: Commercial Property management have a different MIP linked to profit from property
Source: Network Rail Management Incentive Plans 2009/10

A “percentage achievement” score is awarded for each performance measure

- For each performance measure, actual performance is compared to the target performance to calculate a “percentage achievement”
  - bonuses become payable at a ‘trigger’ point
  - if targets are met, the percentage achievement is usually 50%
  - “maximum performance” is awarded if targets for the year ahead are met, usually getting 100% achievement

Percentage achievement



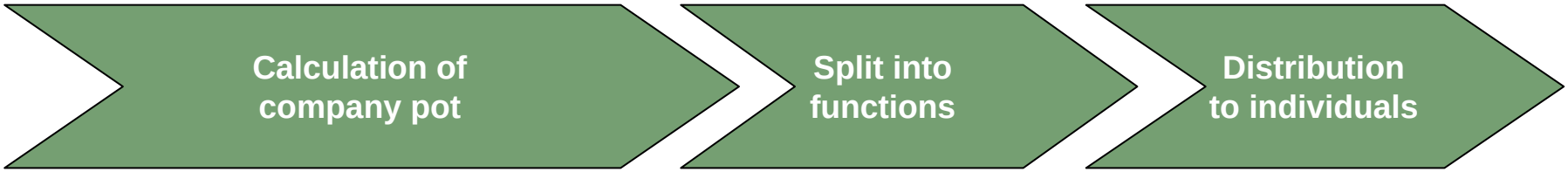
- The calculation of the incentive is as follows:

$$\sum_{\text{Summed for all performance measures}} (\text{Percentage achievement} \times \text{Weighting}) \times \text{Base salary} \times \text{Base salary percentage} + \text{Long term incentive component}$$

- If maximum performance is achieved for all measures, the overall percentage achievement is 100%
  - an Executive Director can therefore achieve a maximum annual incentive of 100% of base salary
- The long term incentive component has the potential to be the same amount as the annual incentive component

Source: Network Rail Management Incentive Plans 2009/10

The Management Incentive Plan for Bands below Executive Grades has a different format



- Company pot is calculated in a similar way to the Executive Grade bonuses
  - the base salary percentage decreases with seniority of Band
  - each 'mechanistic' measure is weighted twice that of 'judgemental' measures
- All Bands have an annual incentive component
- Only Bands 1 and 2 have a long term incentive component

- The total company pot is split between functions to create a function bonus pot
- Functional Directors can split this at their discretion and distribute to Performance Pay Leaders

- Performance Pay Leaders allocate bonus awards from the function bonus pot to individuals based on individual performance

Source: NR Management Incentive Plans 2009/10

Network Rail has launched a Transformation Programme to help it deliver the required efficiency savings in CP4

Programme	CP4 Target net benefit (£bn)	Example initiatives
Asset Management	1.3	• Track renewals to be based on asset condition and network criticality • Route Asset Management Plans under development for c. 305 strategic route segments • Revised workbook volumes for all assets
Efficient Infrastructure Delivery	2.2	• Introduce Maintenance 2b/c organisation and changes to maintenance working patterns
Access Management	0.2	• Reducing possession time to install modular switches and crossings from 54 hours to 21 hours • Reduce take-up and hand-back times for possessions from 90 minutes to 60 (aim is 30)
Network Operations	0.2	• Streamlining the organisation by reducing staff numbers by more than 500
Total*	3.3	

Note: * Net of duplications and incremental costs
Source: NR Management Incentive Plans 2009/10

Summary

TOCs

- There are 19 franchised passenger rail operators and a further 5 open access operators. Almost all are owned by the private sector
- The current franchising system is based on tightly specified 7-10 year franchises but the DfT has announced its intention to move to longer, more flexible franchises which would give TOCs greater scope for innovation

FOCs

- There are currently four major FOCs, all of which are owned by the private sector and are open access users of the network
- Rail freight operators face intense competition from each other and with road freight
- FOCs pay variable access charges but not fixed charges

Network Rail

- NR is the monopoly owner and operator of the national rail network, including track, signalling, power, civils and stations
- NR has Company Limited by Guarantee (CLG) status, which means it operates as a private company but profits are reinvested in the network. It does not have any equity and all of its debt is currently guaranteed by government
- NR's board is accountable to about 100 members. This members based governance regime is widely considered to be ineffective
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- The ORR carried out extensive work during the PR08 process to assess NR's efficiency. It concluded that there was a significant efficiency gap between NR and top quartile comparators, but that the range of uncertainty over the size of this gap was significant

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On-the-day operations (1 of 2): Responsibilities are shared between TOCs and NR. There are several different mechanisms through which both parties are incentivised to improve operational performance

- On-the-day operations include:
  - running trains
  - signalling and control
  - responding to incidents as they occur

- In the current setup:
  - NR is responsible for signalling and overall control. Operators also have controllers, who communicate with NR controllers, who in turn communicate with signallers
  - NR respond to infrastructure-related incidents and operators respond to rolling stock related incidents

- TOCs and NR have a variety of incentives to run on-the-day operations efficiently:
  - TOCs are incentivised by increased passenger revenues that follow from improved performance
  - NR is required to deliver improvements in PPM* and cancellations, set out in the HLOS
  - the ORR also sets a target maximum number of delay minutes that should be attributable to NR
  - NR and TOCs are incentivised by Schedule 8, under which they have to pay each other for delay minutes for which they are responsible. They also specify targets in JPIPs**
  - PPM statistics are published every period in the form of a TOC league table. This leads to competition between TOCs to move up the rankings
  - there is also significant political pressure applied to both TOCs and NR to improve performance

Notes: * Public Performance Measure, the proportion of trains less than 5/10 minutes late; ** Joint Performance Improvement Plan

On-the-day operations (2 of 2): Operational performance is one of the industry success stories over the last few years. However, stakeholders raised concerns about the design of Schedule 8

- Operational performance is one of the industry success stories over the last few years. Overall performance has reached record levels, although significant variations in performance do still occur across the network. The existing incentives have generally been successful in driving improvements
- The main complaint from stakeholders is regarding the design of Schedule 8
  - delay minute attribution process absorbs too much resource and drives counterproductive behaviours – although the importance of data collection for root cause analysis purposes was recognised

    "…There is a lot of unproductive time spent allocating blame …"

    "…It is cheaper to shift delay minutes to someone else than to find out the root cause …"
  - Schedule 8 payments do not accurately reflect revenue impacts. In particular, the varying value of a delay minute or the knock on impact of delays to other TOCs

    "…Schedule 8 never compensates us for all our losses …"
  - a revenue based system might be preferable, but it would need to take some account of responsibility for delays
- TOCs and NR have agreed to override Schedule 8 in some regions in order to reduce the level of resources spent on unproductive fault attribution activities
- Some TOCs do not think that NR is properly incentivised to minimise train cancellations

  "… TOCs can lose their franchise on cancellations, but NR has no direct incentive on cancellations …"
- There is also an issue with train prioritisation for signallers. Nearly all trains are given the same Class 1 prioritisation which makes it difficult to prioritise trains when responding to incidents. Prioritisation often depends on the relationship between TOCs and NR

Source: L.E.K. stakeholder workshops

Capacity and timetabling (1 of 2): NR has overall responsibility for capacity allocation and timetabling, but there are well established industry processes whereby train operators input into the timetabling process

- NR has overall responsibility for capacity allocation and timetabling, but there are well established industry processes whereby train operators input into this process
- TOCs have service level commitments (SLC) which specify in detail the minimum number and type of services that they are required to operate. The precise level of detail of the SLC varies between franchises but will often include: frequencies, journey times, minimum stops, and first and last trains
- TOCs are incentivised to maximise revenue from the services specified in their SLC so will communicate its preferences to NR. TOCs may also wish to operate additional services which are not specified in the SLC if it thinks that these are commercially viable
- FOCs need flexibility to respond to customer demand, which can vary at short notice. As a result, they need more train paths in the timetable than they will actually use on a day-to-day basis
- NR has to try to reconcile any conflicting train operator requirements. NR's first responsibility is to ensure that it provides train paths to each operator that are in accordance with the firm rights specified in their Track Access Agreements
- In practice, the annual timetable development process is an incremental process whereby the previous year's timetable is used as a starting point and incremental changes are made. It is very rare for major timetable recasts to take place. Major timetable changes are very difficult to implement in certain parts of the network (e.g. Birmingham) due to the number of constraints
- The Track Access Agreements do not provide any incentive on NR to accommodate requests for additional train paths. The incremental access charges that NR receives are only intended to recover NR's efficiently incurred short run marginal costs. Furthermore, additional services would make it more difficult for NR to achieve its operational performance targets
- As a result, ORR included a Volume Incentive in PR08 to provide an incentive on NR to accommodate additional train services

Capacity and timetabling (2 of 2): NR is generally considered to be not properly incentivised to maximise industry revenue by optimising the timetable

- Stakeholders have commented that the Volume Incentive is opaque and does not really have an impact on NR's behaviour. Furthermore, the level of payment (even if reached) is too small to adequately incentivise the company. As such, NR is generally considered to be not properly incentivised to accommodate additional train services beyond the level required by HLOS
- Some stakeholders think that NR is not sufficiently flexible in its approach to timetable development. In particular, it does not make full use of the flexibility contained in Track Access Agreements to adjust the timing of established services in order to optimise across the network as a whole. This is a particular issue for multi-user routes
- Some stakeholders do not think that NR should be responsible for timetabling due to its lack of commercial incentives to grow industry revenue
- The timetabling process is also thought to be hampered by political interventions and prescriptive SLCs
  - there is a tension between the DfT and ORR regarding the allocation of train paths to open access operators
  - it has taken 10 years to develop the new Eureka timetable for the East Coast Mainline

Planning and enhancements (1 of 2): Network Rail and the DfT take the leading roles with planning and enhancements

- NR is responsible for developing Route Utilisation Strategies (RUSs). These are medium-to-long term strategies for each route. They tend to focus mainly on identifying capacity bottlenecks and options for addressing these
- The DfT uses the RUSs to inform its High Level Output Statement (HLOS) of the outputs that it is seeking to procure from the rail industry during each control period. HLOS is accompanied by a Statement of Funds Available (SoFA) and a high level 30 year strategy
- CP4 HLOS enhancement schemes are being delivered through two main routes
  - the ORR's PR08 determination included an allowance for fixed infrastructure related schemes and these are being delivered by NR
  - the DfT is negotiating changes to franchise agreements to implement timetable and rolling stock capacity related schemes
- NR, the DfT and other stakeholders also specify a few major enhancement schemes which are outside the HLOS process (e.g. Reading station)
- The ORR / NR have developed an Investment Framework to facilitate investments by other parties
- Enhancements can be initiated by TOCs but this is relatively unusual under the DfT's current franchising system due to the prescriptive specifications, the relatively short franchise terms and the franchise award criteria. One of the key objectives of the DfT's radical franchise reform proposals is to encourage more TOC led investment
- In many cases rail enhancements are not commercially viable in terms of their financial return, but government may be willing to fund them due to their broader economic benefits

  "… One reason that the railway is so expensive is that there are lots of projects with no commercial benefit …"
- However, there are exceptions to this. Chiltern Railways' Evergreen 3 enhancement is proceeding on a purely commercial basis. It should be noted that Chiltern Railways operates under a very different form of franchise agreement to the DfT's current system

Planning and enhancements (2 of 2): There are a number of issues with how enhancements are planned and delivered

- Some stakeholders think that giving NR responsibility for developing RUSs leads to them favouring infrastructure solutions over other forms of solution
- Train operator involvement in developing the CP4 HLOS schemes was relatively limited. It mainly happened indirectly through their input to NR's RUSs. ATOC has initiated a process ("planning ahead") to increase TOC involvement for CP5
- Some HLOS enhancement packages have been undermined by DfT only procuring part of the package. For example, platform lengthening has gone ahead without procuring the rolling stock that would use the enhancement

  "… Network Rail have millions to spend on platform lengthening, but we have no vehicles yet …"
- There have also been instances of the DfT delaying schemes by changing its mind

  "… The government decides what it wants to buy. Then we go through the process of writing the Strategic Business Plans. Then the government changes its mind. This stop start planning process doesn't allow any smoothing of the supplier base …"
- One of the key issues with enhancements is that the industry sees enhancements as a free good. Neither NR nor TOCs normally have an incentive to value engineer schemes to ensure that they deliver the required capabilities and other outputs at the lowest cost. although NR enhancements are subject to ORR efficiency, which is established on a scheme by scheme basis. Delivery of value for money in terms of scope is largely dependent on ORR oversight
  - NR is happy for the efficient cost of enhancements to be added to its RAB, as it receives an allowed return on its RAB, as long as the long term financeability of the company is not impaired
  - TOCs are generally held harmless to changes in FTAC so do not end up paying for RAB funded enhancements (this does not apply for TOC self financing schemes where the TOC payments are ring fenced outside the periodic reviews for enhancements)
- Although NR is incentivised to deliver enhancements below budget many TOC stakeholders think that TOCs could deliver schemes much more efficiently (particularly for stations and depots)

Network Rail is responsible for asset management, access management and delivery of MRE (1 of 2)

- Network Rail is responsible for:
  - Asset management: Deciding what MRE work needs to be done, where and when
  - Access management: Taking possession of sections of the network in order to carry out engineering works
  - Deliver: Managing delivery of the work. Maintenance is carried out in-house, whereas renewals and enhancements are mainly contracted out

- Efficiency in asset management and MRE delivery are incentivised through the ORR's periodic review process and the resulting price determination. NR also has a licence obligation to manage assets sustainably
  - the ORR's PR08 assessment was that NR was relatively inefficient at both asset management and deliver of MRE. NR recognises this and has made Asset Management and Efficient Infrastructure Delivery two of the key workstreams of its CP4 Transformation Programme

- A number of mechanisms are in place to incentivise the efficient planning and use of engineering possessions
  - the ORR introduced new targets for NR in PR08 – these are called possessions disruption indices (PDI)
  - NR pays financial compensation to train operators for taking disruptive possessions via the Schedule 4 and Network Change mechanisms
  - PR08 also introduced the concept of Joint Network Availability Plans (JNAPs) which are intended to build on the success of JPIPs

Network Rail is responsible for asset management, access management and delivery of MRE (2 of 2)

- Although the possessions planning process involves a number of TOC consultation stages, TOC stakeholders at L.E.K.'s workshops reported that they felt as though the consultation mainly involved TOCs being informed of what NR had decided
- NR should in theory be able to optimise possessions from a whole system perspective based on Schedule 4 payment rates. However, many TOCs reported that these rates did not accurately reflect the impact on their business, particularly for a lengthy series of possessions
  - one of issues is that ORR adjusted the Schedule 4 payment rates in PR08 but the DfT has clawed back the change from TOCs through the Clause 18.1 change mechanism

  "… 18.1 means that we pay everything back to the government, which isn't doing the industry any good …"
- TOCs that have prepared JNAP are relatively positive about them. JNAPs have given them the opportunity to explain to NR the true revenue impact of different types of possessions in different areas – for example through a ranking of their routes by revenue

  "…our JNAP has driven improvement between Didcot and Oxford. It has helped engineers to understand what the customer wants …"
- However, it was clear from our workshops that very few TOC managers were even aware of the existence of the JNAP concept – a full 20 months after it was introduced

  "… what is a JNAP? …"
  Two TOC MDs, in separate workshops
- The high profile announcement by government of a 7-day railway was considered to be unhelpful as it reduces flexibility. There are some situations where TOCs highly value a 7-day railway but there are other times when they would prioritise other objectives

  "… A good infrastructure is in everyone's interest. A seven day railway is fine in principal but is not currently in our interest: Sunday can be used for works! …"

Stations and depots (1 of 2): Network Rail manages some stations, but most are leased from Network Rail and managed by an operator

- NR manages some stations, but most are leased from NR and managed by an operator, referred to as the Station Facility Owner (SFO)
  - NR is responsible for major maintenance work
  - light maintenance and repairs are carried out by the SFO
- NR leases depots to Depot Facility Owners (DFOs)
  - NR is typically responsible for renewals
  - the DFO is responsible for repair and maintenance, and occasionally also for renewals
- SFOs are primarily incentivised by commercial considerations
  - SFOs are incentivised by retail revenues
  - some operators are incentivised through their franchise agreements, for example
    - NPS targets form part of Southern's franchise agreement
    - the Service Quality Incentive Regime (SQUIRE) is part of ScotRail's franchise agreement

Stations and depots (2 of 2): There is widespread dissatisfaction with the current split of responsibilities at stations and depots

- Stakeholders at L.E.K.'s workshops were unanimous in declaring that the current contractual arrangements for stations and depots are far more complicated than they need to be. Moving to normal full repairing leases would greatly simplify the arrangements and address many of the current issues

  "… How on earth did they come up with the current arrangements? You couldn't invent a more complex system …"

- However, concern was raised over how stations would be funded under the new regime. For example, TOCs might be incentivised to "patch and mend" when renewal might be the better whole life solution

  "… You have to be aware that we cannot afford big lumpy expenditure such as a new roof for Marylebone. We would just tape the roof. However, most other things you could do …"

- Stakeholders also reported that depots were largely overlooked during PR08 and are in need of significant investment

  "… ORR didn't give Network Rail any money to enhance depots. There is no incentive for a TOC to invest in depots because then they have to pay a higher lease charge, even if they used their own money to invest …"

  "… Depots aren't viewed as something which contributes to delivering outputs …"

Rolling stock selection (1 of 2): TOCs procure new vehicles, but the rolling stock to be used is sometimes specified by DfT in franchise agreements

Note: This slide focuses solely on rolling stock issues relating to the interface between train operators and NR

- TOCs used to be responsible for deciding what rolling stock to use on their franchise and procuring new build vehicles if that is their preferred strategy
- However, the DfT has become increasingly involved with rolling stock selection and procurement over recent years. This has occurred through a number of mechanisms:
  - specification of required fleet in the franchise bid ITT. This could either be directly, or more typically, indirectly through the required characteristics of the fleet
  - direct procurement of rolling stock. Examples include the Southeastern Javelins and IEP
  - management of rolling stock cascades. For example, to facilitate HLOS capacity enhancements
- Train operators pay Variable Track Access Charges (VTAC) to NR for operating rolling stock on its infrastructure. These charges are intended to compensate NR for the short run marginal cost of the wear and tear to its infrastructure
- Rolling stock selection also impact NR through the timetabling process because the acceleration and speed characteristics of rolling stock varies significantly

Rolling stock selection (2 of 2): Current arrangements appear to work fairly well from a train operators – NR alignment perspective

Note: This slide focuses solely on rolling stock issues relating to the interface between train operators and NR

- Train operators have to take a wide range of factors into account when selecting or procuring rolling stock. The relative importance of VTAC charges to the decision making process varies significantly depending on the type of service being operated. In some cases VTAC is immaterial, whereas in other cases it is one of the key factors
- However, VTAC rates are generally considered to be cost reflective. As such, train operators have an appropriate incentive to select rolling stock which is less damaging to NR's infrastructure

  "… VTAC is probably the right mechanism to incentivise efficient rolling stock procurement …"

  - but it can take a number of years for the damage characteristics of new rolling stock designs to be fully understood

  "… Having a price list like at present is probably the right approach, although there are a few "funnies" in there …"

- There have been a few situations where commercially attractive opportunities to improve the track-friendliness of trains have been identified but industry contractual arrangements have acted as a barrier to implementation. One of the key barriers is the risk to TOCs of the DfT clawing back any VTAC savings through Clause 18.1

  - the South West Trains Desiro fleet is a well documented example of this (although this situation has now been resolved)