L.E.K.

frontier economics

Rail VfM

Alternative Railway Structures: Final Report – Volume 1

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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
- Introduction
- Horizontal separation
- Vertical integration
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Introduction

- The McNulty Review has identified four structural options for improving value for money in the rail industry:
  - *Base package:* Radical franchise reform, regional accounting separation of Network Rail ("NR"), and cost and revenue sharing
  - *Horizontal separation:* NR split into regional units, some or all of which could be sold to alternative providers
  - *Vertical integration:* Competitively tendered concessions for integrated train operators and infrastructure managers on a regional basis
  - *Vertical alignment:* Some functions would be provided by some form of an alliance between the regional infrastructure manager ("Regional IM") and the dominant train operator in that region
- The Department of Transport commissioned L.E.K. Consulting (International) Ltd. ("L.E.K.") to further develop and evaluate three of the alternative railway structures: horizontal separation, vertical integration and vertical alignment. The client for this work is the McNulty Review Rail Value for Money team
- Horizontal separation is a key enabler of vertical integration and vertical alignment. As such, we have evaluated the two "vertical" options in terms of their incremental impact relative to horizontal separation (not relative to the status quo)
- L.E.K. was separately commissioned by the ORR, ATOC and NR to advise on the cost and revenue sharing component of the base package. L.E.K. submitted its final report for that study on 25 February 2011. We have included a brief summary of that option in this presentation. Readers should refer to our 25 February 2011 report for further details of our work for the ORR, ATOC and NR

The structural options could involve some significant changes to Network Rail. There are a number of very important advantages and disadvantages of Network Rail being in its current form. The key issue is how to address the disadvantages without losing the advantages

Summary of advantages and disadvantages of Network Rail in its current form

Advantages

- Facilitates network wide coordination and optimisation, e.g.
  - Strategic planning
  - Major projects (e.g. ERTMS)
  - Capacity allocation and timetabling
- Facilitates unbiased resolution of conflicting train operator aspirations
- Reduces transaction costs associated with train operators crossing regional boundaries
- Helps to spread best practice and ensure consistency and across the network
- Economies of scale, e.g.
  - Procurement
  - Prioritisation of scarce resources
- Helps to safeguard sustainability

Disadvantages

- NR has a monopoly position and does not have any close comparators. As a result, it does not face the level of external pressure required to ensure that it is responsive to its customers and delivers VfM for its funders and customers
- Further issues result from its current highly centralised management approach
  - Reduced rate of innovation
  - Slow decision making in some situations
  - Harder to achieve locally optimised solutions
- Misalignment of incentives between NR and train operators inhibits whole system optimisation based on market demand
- Cost of interface between NR and train operators (additional resources and slower decision making)

The GB rail network is a complex system. We strongly recommend a phased, evolutionary approach to implementing any structural changes. This approach should facilitate changes to the ex-ante plans to take account of emerging information obtained from implementing the earlier phases of the change programme

Comparative regulation of Regional IMs can provide significant VfM benefits. L.E.K. recommends implementing horizontal separation of NR in order to capture these benefits. Achieving the full benefits probably requires multiple owners of the Regional IMs

- In a number of other regulated sectors, comparative regulation has provided significant benefits in terms of increased efficiency and VfM. There is also a body of academic literature to support this view. These benefits derive from:
  - the ability of regulators to compare performance of different companies and to tighten the efficiency targets included in regulatory settlements
  - the ability of local management to innovate and respond to local incentives
  - increased competitive pressure
- Diversity of ownership (i.e., more than one owner being compared) is an essential part of this dynamic. The efficiency benefits of one separately owned Regional IM comparator (based on Ofgem's analysis of the sale of gas distribution networks) would be £5.5bn PV. For three separately owned Regional IMs it would be £11.2bn PV
- The transition costs and additional interface costs should be an order of magnitude lower
- An evergreen licence, regulated by ORR, similar to other regulated utilities, appears to be the most attractive option for Regional IMs
- We recommend that the industry moves rapidly to comparative regulation. This requires that NR's devolution process is driven far enough that its operating routes can be regulated effectively by ORR on a comparable basis. ORR should establish regional, public efficiency (and other key) targets for CP5
  - many of NR's operating routes are of similar size to successful European railways. Achieving scale economies does not typically require scale as large as NR
  - some potential changes to the regions used for this purpose should be considered as a matter of urgency because NR is currently establishing regionally separated accounts
- The ORR/DfT should then market test the sale of a Regional IM (we discuss later whether this should be as part of a vertically integrated concession)

Network-wide operators are very nervous about the potential negative impacts of horizontal separation. To mitigate the risk, independently owned Regional IMs should only be created in relatively self-contained parts of the network and a number of key functions should remain centralised – at least in the short/medium term

- Freight and other network-wide operators are almost as nervous about the impact of horizontal separation as they are about vertical integration. They fear that the significant advantages of having NR in its current form (as described earlier) could easily be lost thereby causing a negative impact on network-wide operators
- There are three key mechanisms for mitigating the risks associated with horizontal separation and vertical integration:
  - A degree of horizontal separation can occur across the whole of the network but separately-owned Regional IMs should only be created in relatively self-contained parts of the network - at least in the first instance, until the approach has been fully tried, tested, refined and bedded down. These include Anglia, Scotland, Kent, Wessex and Sussex
  - Keep a number of key functions centralised to preserve network-wide benefits (see next slide). The scope of centralised functions can be refined over time
  - Have appropriate incentives in place to ensure the network continues to meet the requirements of all stakeholders involved (e.g., protecting secondary and small operators)

If horizontal separation is implemented then some activities should remain centralised in order facilitate coordination and secure network benefits. The ownership arrangements for these should take into account for whose benefit the activities have been centralised

Central functions

System authority roles

Standards for inter-operability (with RSSB, not duplicative)

Signalling priority rules

System planning roles

Strategic planning, including leadership of RUS programme

Major projects / enhancements

System operator roles

Capacity allocation

Timetabling coordination

High-level possessions co-ordination

National IT systems & Information services

"Single desk" for network wide operators

Access charging collection and allocation

Regional IMs would be required by their licences to cooperate with these central functions

Support services

Scarce resources incl. heavy plant

Group procurement

Corporate support

Logistics

Assurance

Regional IMs could potentially opt out from purchasing these support services

Devolved activities

Signalling

MOMs

Control functions

Performance management

Data collection

Customer services (operators)*

Managed stations

Route AMPs

Delivery of maintenance

Delivery of renewals

Delivery of small / medium enhancements

Route planning

Possession planning

User specification for large projects

Scheme development

Safety Plan formulation

Asset management strategy

Engineering R&D and technical strategy

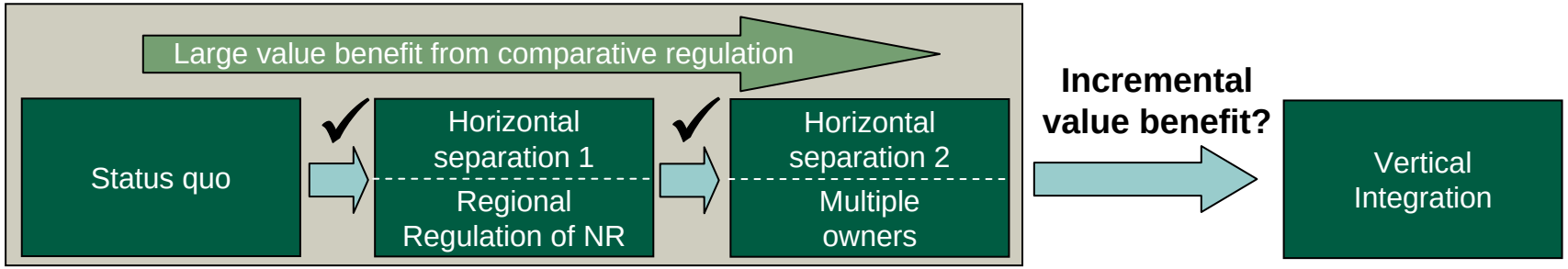
[Power management]

[Telecoms]

[Property]

Note: * Includes management of track access and franchised stations access

The vertical integration option has been evaluated in terms of its incremental impact relative to horizontal separation with multiple owners



Key features of vertical integration option

- Combines together the current responsibilities of one or more passenger rail franchises and a Regional IM such that a single economic entity has overall responsibility for: train operations; stations and depots management; on-the-day operations (signalling, controls and performance management); and maintenance, renewals and most enhancements of all other fixed infrastructure
- However, the "vertical integration" option should not be thought of in terms of the 1960s/1970s approach of carrying out everything in-house. Instead, it should be thought of in terms of "quasi-vertical integration" in which the supply chain leader has the flexibility to shape the value chain to suit its strategy and core competencies, together with the specific circumstances it faces and emerging developments
- VI would be implemented through the letting of a finite duration concession of 15-30 years (ideally at the top end of that range subject to EU legal restrictions and DfT providing sufficient flexibility in its approach to franchise specification)
- The Regional IM component of the VI entity would be regulated by the ORR in the same way as all other Regional IMs. This would be essential for obtaining the full benefits from comparative regulation
- If the VI concession length is greater than 15 years, and the DfT's approach to specification significantly restricts the concessionaire's flexibility, then we would recommend applying some form of ORR led periodic review process to the train operations component of a VI concession in order to limit the overall risk exposure of the VI entity. Exactly how this process would work requires significantly more development work than is possible within L.E.K.'s current remit

VI has a number of potential advantages and disadvantages relative to horizontal separation with multiple owners

Summary of potential advantages and disadvantages of VI relative to HS with multiple owners

Advantages

- Reduced interface management costs during the term of the concession
- Giving overall operational control to the organisation responsible for running the trains should help to minimise disruption to trains and improve passenger information
- Aligns incentives and facilitates market driven whole-system optimisation for a particular region
  - Decision making based on actual economics (to the extent that these are known) instead of contractual proxies such as Schedule 4, Schedule 8 and VTAC (although these mechanisms will still be required for secondary operators)
  - Specification and prioritisation of infrastructure work based on train operators' needs
- Whole industry P&L facilitates greater commercial focus and challenge
- Helps to safeguard sustainability
  - Train performance impact of changes in asset quality are internalised (at least until the end of the concession)

Disadvantages

- Greater transition cost and risk
  - Many TOCs do not currently have the skills or knowledge
- Mixes together two fundamentally different types of business. Could result in TOC owning groups reducing their focus on their train operations business
- Potential negative impact on "competition in the market" as a result of a VI entity favouring its own train services. This could impact both competing services and non-competing services (e.g. freight)
- Potential negative impact on "competition for the market"
  - Reduced intensity of initial bidding if some TOC owning groups do not want to bid for a VI concession
  - Potential reduction in VfM as a result of applying regulation to TOC after 15 years rather than holding another competition for the market
- Potential negative impact from any reduction in the ideal length of a Regional IM concession

It is very likely that there would be incremental benefit in moving to VI in some regions. However, there are other parts of the network where the disadvantages of VI are very likely to outweigh the advantages due to the mix of traffic and the nature of the competition

- The RVfM team identified in its Interim Report that "the principal key to delivering cost savings is how organisations and people work together, and there is a pressing need to develop structures which enable/require infrastructure managers and train operators to work together in much closer partnerships to meet cost reduction objectives"
- VI is the structure that achieves the best alignment of incentives between infrastructure managers and train operators
- The value impact of the advantages and disadvantages of VI relative to horizontal separation with multiple owners will vary significantly across the network for a number of reasons including:
  - The complexity of the interface between train operators and infrastructure managers depends on whether the infrastructure is operating at close to full capacity and whether major programmes of renewals and enhancements are required
  - The mix of different types of traffic, the ownership of the train services and the extent to which "in the market" competition currently exists or is likely to occur in the future
- There are a number of parts of the network which are relatively self contained, have a dominant train operator, which have a high need for coordination between train operators and the Regional IM, and where there is limited prospect for "in the market" competition with the dominant train operator. It is very likely that there would be incremental benefit in implementing VI in these regions
- However, there are many other parts of the network where the disadvantages of VI are very likely to outweigh the advantages due to the mix of traffic and the nature of the competition. VI should not be implemented in those regions
- The biggest risk of VI is the potential negative impact on "competition in the market". However, providing that the safeguards outlined in this presentation are implemented, and that the ORR is fully committed, resourced and empowered to enforce these safeguards, then L.E.K. thinks that it should be possible to avoid secondary operator services being negatively impacted by VI in relatively self contained regions with a dominant operator
- Given the high level of uncertainty over the actual impact of each of the advantages and disadvantages of VI in practice, we would strongly recommend a phased roll-out whereby VI is implemented in a single region to start with and the learnings from that region are used to inform the decision as to where else to implement VI

It is critical that any VI structure protects any existing secondary operator services and facilitates development of secondary operator services in locations where there is a realistic prospect of this occurring

Mechanisms for protecting secondary operators

Central Functions responsibilities

The "essential functions" and a number other roles would be carried out by an organisation that is independent from the vertically integrated entities

Key roles relevant to secondary operator protection include (inter alia):

- Signalling priority rules
- Leadership of RUS programme
- Network capacity allocation
- Timetable planning and coordination
- Possessions coordination
- Access charging

Legal and process safeguards

Legal and process safeguards could include (inter alia):

- Enhanced licence conditions covering non-discrimination for day-to-day ops or possessions planning
- Industry rules and processes (e.g. Network Code and Access Conditions)
- Regulatory overview by ORR, including a "fast track" expert dispute resolution service and monitoring of KPIs
- Transparency of key decisions and decision criteria
- Clear definition of network capability and capacity that should be protected for secondary operators
- Government's strategic approach to freight to be clearly articulated in HLOS
- Possible VI entity board member for secondary users

Incentives

A range of different mechanisms could be used to incentivise Full VI entities to engage constructively with secondary operators to help them to develop their services

For example, if government wished to subsidise rail freight due to its broader economic benefits then it could make some of these payments to the VI entity in order to incentivise it to help FOCs to develop their services (e.g. it could pay a subsidy to the VI entity based on a percentage of the freight revenue for services on its infrastructure)

Please refer to the Cost and Revenue Sharing section for further details

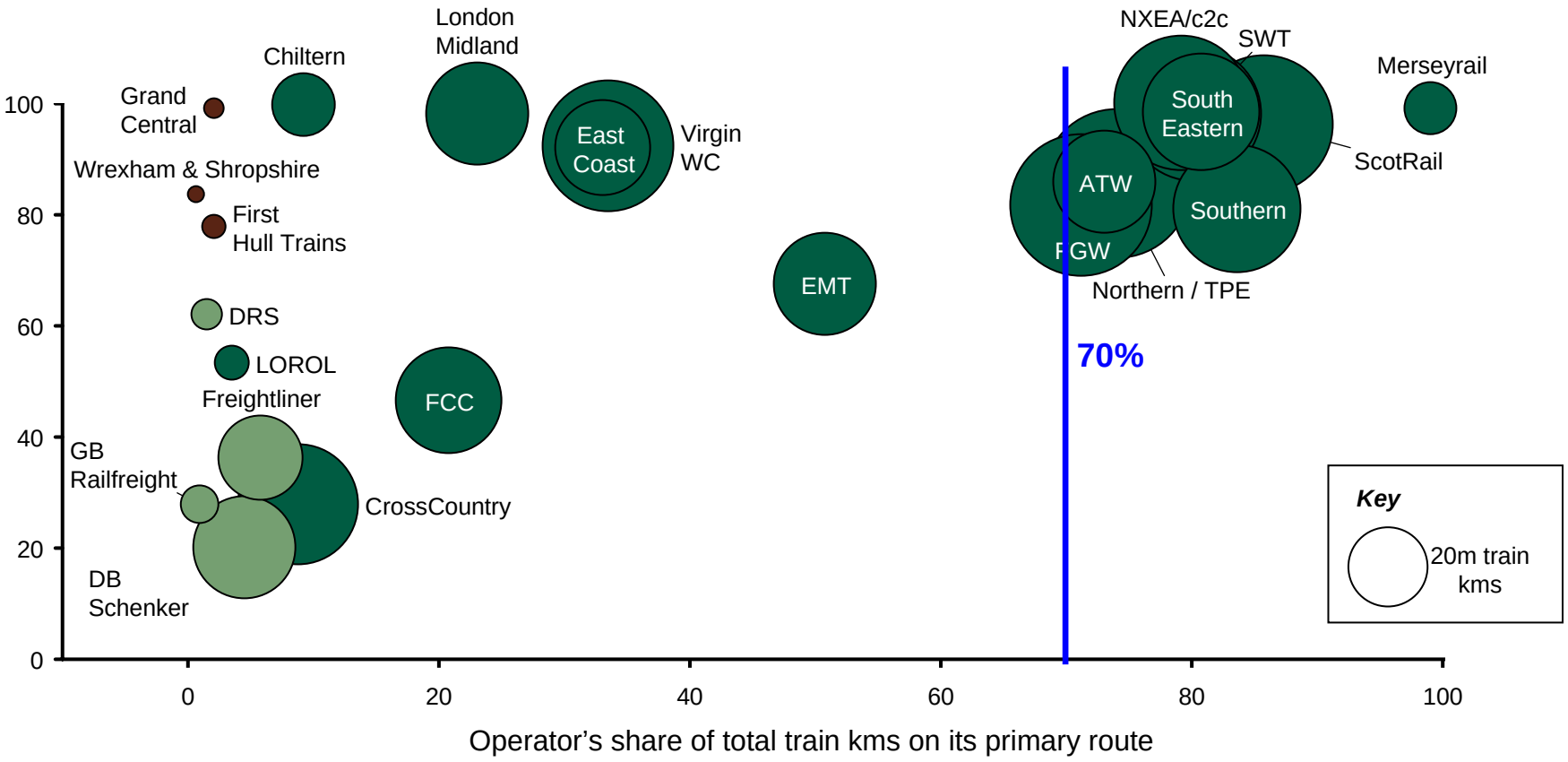
Five of NR's existing nine operating routes are already relatively self contained and have a single dominant TOC. Mapping between TOCs and NR regions could be further improved by splitting Wales out of the Western operating route and by splitting a Northern route out from LNE and LNW

- Five of NR's existing nine operating routes are already relatively self contained and have a single TOC with at least a 70% share of train km
- The mapping between TOCs and NR regions could be further improved:
  - By splitting Wales out of the Western operating route
  - By splitting a Northern route out from LNE and LNW. The east coast and west cost main lines would remain in LNE and LNW respectively
  - By splitting Merseyside out of LNW
  - By splitting out the east coast and west coast mainlines from Scotland
- The four potential changes listed above would need to be analysed in more detail before a final decision is taken. However, early implementation would be advantageous as it would enable a financial and managerial track record to be established for these regions. This would facilitate comparative regulation and other structural options
- The chart overleaf shows the mapping between train operators and the 12 NR operating regions that would result from these changes
- It should be noted that further improvements to the mapping between train operators and NR operating regions could be made through minor changes to either the scope of each franchise or the precise boundary between NR routes

Nine TOCs would have at least a 70 percent share of the train km of their primary NR operating route if NR split out Wales, Northern and Merseyside as separate regions

Operator vs. primary operating route*

Percent of operator's train kms on its primary route



Note: * Train kms are allocated based on mapping of operating route to strategic route section by track km
Source: NR; L.E.K. analysis

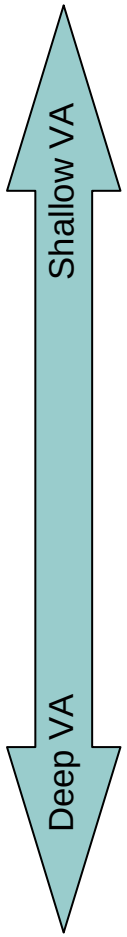
Of the five franchises that have a high share of train km on existing NR operating routes, Anglia presents the earliest opportunity for implementing VI. As such, L.E.K. recommends implementing VI in Anglia (inc. c2c)

Franchises with a high share of train km on existing NR operating routes

Franchise	Franchise end date	Region	% of TOC train kms in primary region	TOC's share of region's total train kms (%)	Interface issues (H/M/L)		Comments
					Pax TOCs	Freight	
NXEA	Feb 12 *	Anglia	100	66	Low	High	Need to resolve position of c2c
c2c	May 13	Anglia	100	14	Minimal	Medium	Could either be kept separate or combined with Anglia Potential diseconomies of scale for infrastructure unit
NXEA/c2c combined	2013 to 2014	Anglia	100	79	Low	High	Some GE line inner services likely to transfer to CrossRail
South-Eastern	Mar 12 or Mar 14	Kent	98	81	Low	Low	Major impact of Thameslink project at London Bridge. Project due to be completed in 2018
ScotRail	Nov 14	Scotland	96	86	Medium	Medium	Not a DfT decision Alignment is improved by taking out the East Coast and West Coast Main Lines. Political risk from Scottish Executive?
Southern	2015 or 17	Sussex (Kent, Wessex)	81	84	Medium	Low	Major impact of Thameslink project. Project due to be completed in 2018 Major interface with FCC on highly utilised Brighton Main Line
SWT	Feb 17	Wessex	98	80	Low	Medium	Potential major scheme to rebuild Waterloo to allow longer trains Significant interfaces in the Southampton area

Note: * DfT is currently procuring a short 1.5 year franchise with an optional 1 year extension; Regions are Operating Routes after splitting out Wales, the East and West Coast Main Lines and Merseyside
Source: NR; L.E.K. analysis

Vertical alignment can be thought of in terms of five depth levels



Summary of different potential forms of vertical alignment

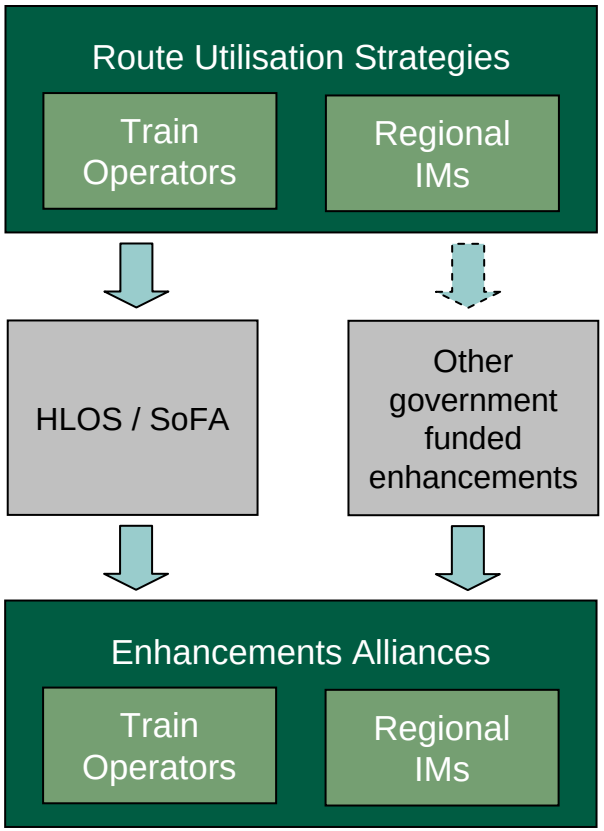
Type of alignment	Description	Comments
Non-contractual deals	Any form of voluntary non-contractual agreement to cooperate between train operator and Regional IM (e.g. co-location of control rooms)	These are types of "bespoke, line-of-sight deals" and are covered in the Cost and Revenue Sharing section
Contractual deals	Any form of voluntary contractual agreement between train operator and Regional IM that does not involve the creation of a jointly owned legal entity	
Voluntary JV	Any form of voluntary contractual agreement between train operator and Regional IM that involves the creation of a jointly owned legal entity	These options differ from each other only in terms of whether the JV was voluntary of mandated
Mandatory JV	As above but requirement to form JV is mandated (e.g. through franchise agreement or licence condition)	
(Quasi-) vertical integration	Train operations and some or all IM activities combined under a single holding company. This option should be thought of as "quasi-vertical integration" in which the supply chain leader is free to structure their supply chain in the way that suits them best. This could include underlying JVs and a wide range of other forms of alliance	Covered in VI section

Feedback from L.E.K.'s alliancing best practice review and stakeholder interviews highlights that it is generally preferable for the scope and terms of any JVs to be left to the JV partners to agree on a "willing buyer" basis rather than being mandated

- The key learnings from L.E.K.'s alliancing best practice review are:
  - partner selection and senior management commitment are the two most important success factors for alliances
  - effective partnering needs to be developed over time. Often successful partnerships will begin with a simple contracting relationship then evolve through increased trust and dependency
- Under the Vertical Integration option bidders would be free to select their own JV partners – if that is their chosen supply chain strategy. By contrast, in the Vertical Alignment option train operators and Regional IMs would not be free to select their own JV partners
- This further increases the importance of giving the senior managers in both the train operator and the Regional IM flexibility over the scope and terms of JVs. That would improve the chances of obtaining their commitment to the success of the JV and would enable them to develop the JV over time as they become increasingly comfortable with the joint working arrangements
- The feedback received from stakeholders during L.E.K.'s interview programme is entirely consistent with these observations. Stakeholders are much more enthusiastic about voluntary JVs than mandatory JVs, and if the latter approach is taken then the way in which the JV is mandated should not force them into a situation that they are not comfortable with

Whilst L.E.K. is generally not in favour of mandatory JVs, the one exception could be some form of mandatory alliancing for government funded enhancements. This would help TOCs and FOCs to ensure that enhancements maximise customer benefits given the funds available

Potential high level process for enhancements



- A recurring theme from L.E.K.'s stakeholder consultation is that enhancements cost far more than they ought to
- One of the key issues is that the industry sees enhancements as a free good. Neither NR nor TOCs typically 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
- One way of addressing this would be for most government funding for enhancements to go through mandatory alliances between each Regional IM and the relevant TOCs and FOCs, rather than to the Regional IM alone
- This would help the TOCs and FOCs to ensure that each £1 of enhancement funding provides maximum benefit for their customers, whilst continuing to allow the Regional IMs to safeguard the assets from a sustainability and inter-operability perspective
- Whilst L.E.K. is generally not in favour of mandatory JVs, we do see enhancements as an area where some form of mandatory alliancing might be justified because train operators and IMs are both important stakeholders for enhancements
  - Train operators should see this as an opportunity to have a major influence on the selection and specification of enhancement projects. Train operators would be given a clienting role in this area

Vertical Alignment JVs option evaluation summary

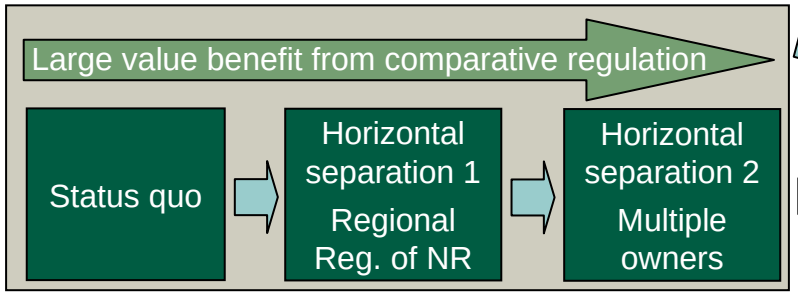
- L.E.K. has evaluated the Vertical Alignment JV options relative to both the multiple owners horizontal separation option and the VI option. VA JVs can be thought of as a halfway house between those two options – at least insofar as they share many of the advantages and disadvantages of VI but with the impact of each item being moderated
- In relatively self contained parts of the network with a dominant train operator VI is the more attractive option. However, VA JVs could potentially be implemented in a wider range of geographies than VI – although it should be recognised that the difficulty of implementation is likely to increase as the number of operators increases
- VA JVs could be implemented prior to the end of current franchises if done on a willing buyer basis. This would enable the benefits to flow sooner. The Chiltern line South of Aynho Junction is an example of where early implementation might be possible
- However, we understand from the DfT/ORR that there may be legal issues with JV's being introduced mid franchise. L.E.K. has not sought legal advice on this matter
- It could also be difficult for the Regional IMs and TOCs to reach an agreement on the structure and terms of a JV. With a monopoly supplier and a monopoly buyer, there is no equilibrium price – it depends on bargaining. This can result in unproductive behaviours aimed at strengthening negotiating positions
- The broader the scope of a VA JV the greater the potential benefit. However, JVs should generally be voluntary because obtaining senior management support is critical to the success of alliances
- Whilst L.E.K. is generally not in favour of mandatory JVs, the one exception could be some form of mandatory alliancing for government funded enhancements. This would help TOCs and FOCs to ensure that enhancements maximise customer benefits given the funds available. Train operators would effectively be given a clienting role in this area
- Enhancement alliances could be rolled out across the network before the start of CP5 and could act as a catalyst for other (voluntary) forms of Vertical Alignment
    - This arrangement could even be used in areas where a VI concession is in place. It would give the secondary operators a say in how government enhancement funding is spent

L.E.K. has evaluated 8 options for cost and revenue sharing. A number of these have significant merit

Option	Implement ?	Comments
1: Regional EBS (symmetrical)	?	L.E.K. has concerns that a Regional Efficiency Benefit Sharing (EBS) mechanism would not deliver VfM in the short term due to a number of factors such as TOCs' limited ability to influence NR's costs. If a Regional EBS were to be implemented then a phased approach aligned with horizontal separation of NR would be best – horizontal separation would significantly improve train operators' ability to influence NR's costs A Regional EBS could create a perverse incentive on TOCs to try to persuade ORR to set soft targets for NR during periodic reviews. To overcome this, any Regional EBS mechanism should be combined with a mechanism that gives TOCs a partial exposure to periodic review determinations, i.e. Option 5 or 6 The relative attractiveness of an outperformance-only EBS mechanism and a symmetrical mechanism depends on how TOCs would price these two mechanisms, and this is uncertain
2: Regional EBS (upside only)	?	
3: NR shares TOC revenue	✓	Implement through franchise re-lets. Also explore with incumbent TOCs whether it can be implemented mid-franchise in a way that delivers VfM for the taxpayer
4: Full scope	X	Implementing a full version of the cost and revenue sharing mechanism in the near term against the wishes of train operators would go directly against the key learnings from the alliancing best practice review
5: Delta FTAC	(X)	Many of the issues with Options 1 and 2 would also apply to Options 5 and 6. However, in one respect they create an opposite issue to Options 1 and 2 – they could act as a barrier to cooperation between NR and train operators because the latter would be incentivised to use any information which they obtain from NR to help the ORR make more challenging price determinations. If Option 1 or 2 is implemented then it should be combined with Option 5 or 6 Options 5 and 6 are very similar. However, L.E.K. has a preference for Option 6 as it is more directly linked to NR's operational expenditure (and is therefore less impacted by additional factors which are outside train operators' control)
6: Delta OMR baseline	?	
7: Higher VTAC rates	(X)	Seeks to achieve the same objectives as Option 3 but is less attractive because it has a much narrower scope and incentives are less well aligned
8: Bespoke line-of-sight deals	✓	The ORR and DfT should promote bespoke, line-of-sight deals. However, a cultural change is required in order for these to make a significant contribution to improving rail industry VfM

Horizontal separation of NR is an essential enabler of all cost and revenue sharing options

In summary, all four of the structural options have a role to play in improving VfM. We strongly recommend a phased, evolutionary approach to their implementation



- If the DfT decides not to proceed with VI then we strongly recommend that it still proceeds with horizontal separation with multiple owners in order to capture the large value benefit from comparative regulation

Vertical Integration

- It is very likely that there would be incremental benefit in moving to full VI in some regions. However, there are many other parts of the network where VI should not be implemented
- Start by implementing VI in Anglia and use the learnings from there to inform the decision as to where else VI should be implemented

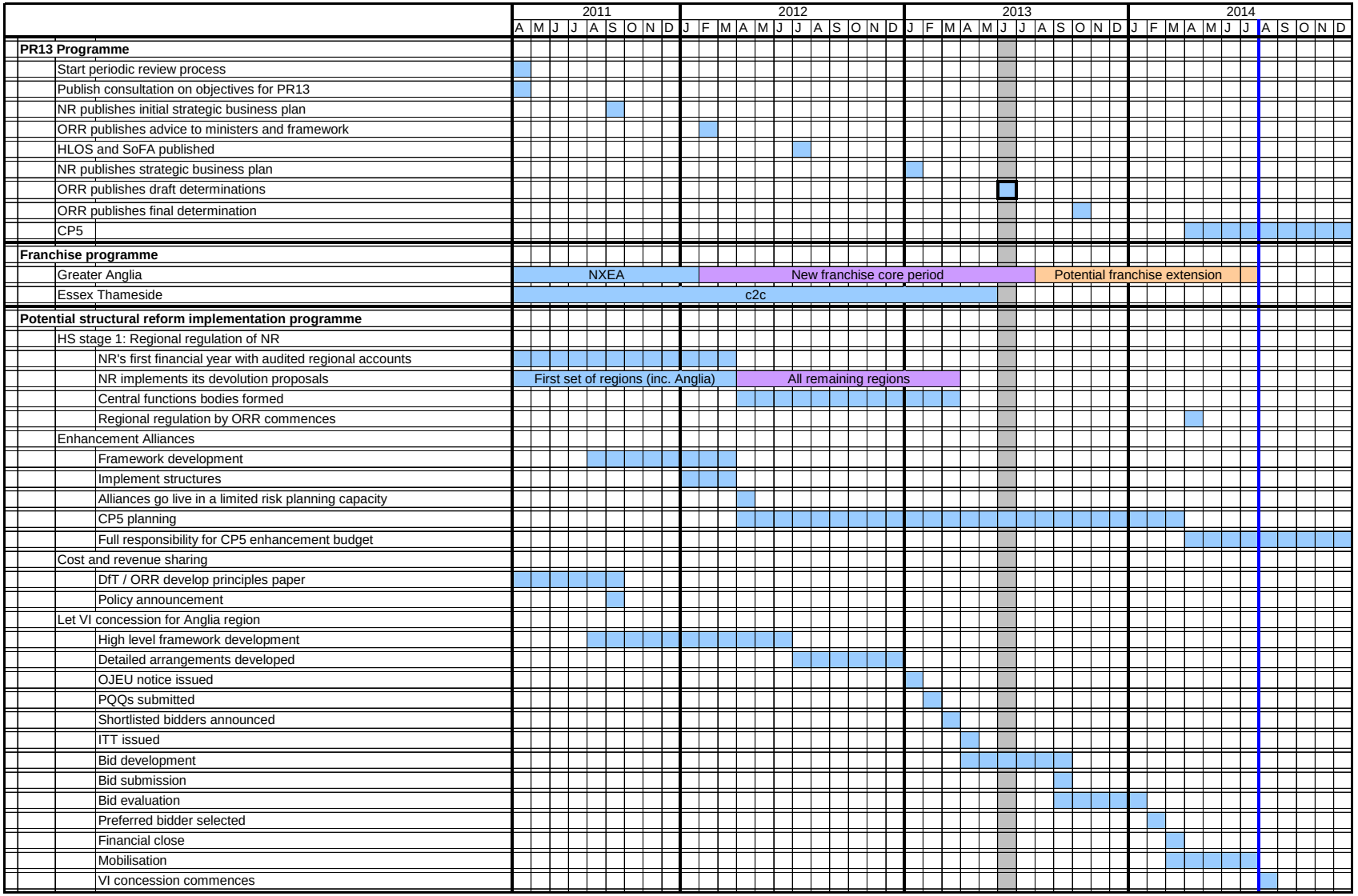
Vertical Alignment JVs

- In relatively self contained parts of the network with a dominant train operator VA JVs are a less attractive option than full VI. However, VA JVs could be implemented in a wider range of geographies than VI
- VA JVs could be implemented prior to the end of current franchises if done on a willing buyer basis. This would enable the benefits to flow sooner
- Whilst L.E.K. is generally not in favour of mandatory JVs, we do see enhancements as an area where mandatory alliances might be justified. Enhancement Alliances could be rolled out across the network before the start of CP5 and could act as a catalyst for other (voluntary) forms of vertical alignment

Cost and revenue sharing

- Cost and revenue sharing has significant merits in principle. A package should be rolled out including partial schemes in new franchises and encouraging bespoke, line-of-sight deals
- They could use the Enhancements Alliances as a platform for implementation

Indicative timeline for implementation programme



This programme assumes full cooperation from NR

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- The McNulty Review has identified four structural options for improving value for money in the rail industry:
  - *Base package:* Radical franchise reform, regional accounting separation of Network Rail ("NR"), and cost and revenue sharing
  - *Horizontal separation:* NR split into regional units, some or all of which could be sold to alternative providers
  - *Vertical integration:* Competitively tendered concessions for integrated train operators and infrastructure managers on a regional basis
  - *Vertical alignment:* Some functions would be provided by some form of an alliance between the regional infrastructure manager ("Regional IM") and the dominant train operator in that region
- The Department of Transport commissioned L.E.K. Consulting (International) Ltd. ("L.E.K.") to further develop and evaluate three of the alternative railway structures: horizontal separation, vertical integration and vertical alignment. The client for this work is the McNulty Review Rail Value for Money team
- Horizontal separation is a key enabler of vertical integration and vertical alignment. As such, we have evaluated the two "vertical" options in terms of their incremental impact relative to horizontal separation (not relative to the status quo)
- L.E.K. was separately commissioned by the ORR, ATOC and NR to advise on the cost and revenue sharing component of the base package. L.E.K. submitted its final report for that study on 25 February 2011. We have included a brief summary of that option in this presentation. Readers should refer to our 25 February 2011 report for further details of our work for the ORR, ATOC and NR

The structural options could involve some significant changes to Network Rail. There are a number of very important advantages and disadvantages of Network Rail being in its current form. The key issue is how to address the disadvantages without losing the advantages

Summary of advantages and disadvantages of Network Rail in its current form

Advantages

- Facilitates network wide coordination and optimisation, e.g.
  - Strategic planning
  - Major projects (e.g. ERTMS)
  - Capacity allocation and timetabling
- Facilitates unbiased resolution of conflicting train operator aspirations
- Reduces transaction costs associated with train operators crossing regional boundaries
- Helps to spread best practice and ensure consistency and across the network
- Economies of scale, e.g.
  - Procurement
  - Prioritisation of scarce resources
- Helps to safeguard sustainability

Disadvantages

- NR has a monopoly position and does not have any close comparators. As a result, it does not face the level of external pressure required to ensure that it is responsive to its customers and delivers VfM for its funders and customers
- Further issues result from its current highly centralised management approach
  - Reduced rate of innovation
  - Slow decision making in some situations
  - Harder to achieve locally optimised solutions
- Misalignment of incentives between NR and train operators inhibits whole system optimisation based on market demand
- Cost of interface between NR and train operators (additional resources and slower decision making)

Structural change is best achieved through evolution rather than revolution (1 of 2)

- The GB rail industry is a complex system. It comprises a wide range of different types of organisation, performing a wide range of different functions, using a wide range of different assets and systems, in a wide range of different types of geography, and is governed through a wide range of contractual arrangements, licence conditions and regulation
  - These interactions are far more complex than for most other regulated industries such as gas distribution
- No matter how much planning is carried in advance of implementing a major change in such an industry, there will be significant uncertainties regarding the outcomes
  - It is highly likely that there will be some shortcomings in the contractual frameworks and business processes, and some unintended consequences. The framework may need to be adjusted to address these
  - Changes in behaviours are hard to predict because they are influenced by personality and culture in addition to pure economic incentives. One person might choose to follow a contract-based management approach while another person faced with the same situation might choose to put the contract to one side and follow a relationship-based management approach
  - There is significant uncertainty regarding the transition costs and impacts on long term industry costs and revenues
- PR08 set NR a baseline which required it to improve efficiency by over 20% in CP4. NR has launched a Transformation Programme to achieve this and has told the ORR that it expects to outperform its baseline. These efficiency improvements should not be jeopardised
- In light of the above, and the fact that this is a safety critical industry, we strongly recommend a phased, evolutionary approach to implementing structural change. This approach should facilitate changes to the ex-ante plans to take account of emerging information obtained from implementing the earlier phases of the change programme

Structural change is best achieved through evolution rather than revolution (2 of 2): This conclusion is supported by academics and other consultants who have analysed the impact of previous rail industry restructuring

Summary of previous research into impact of speed of rail industry restructuring on success of outcome

"… Higher reform intensity does not necessarily increase productivity. Rather it depends on sequencing of reforms. In countries in which reforms are implemented in a sequential way, productivity increases, while the opposite is true in countries that have implemented packages of reforms …"

Railway (De)Regulation: A European Efficiency Comparison, Friebel, Ivaldi and Vibes, March 2005

"… the process was dramatically accelerated for political reasons, amplifying both the opportunity for errors and the effect of those errors when they did occur …"

"… There are lessons to be drawn from the UK experience. The approach was overly complex, involving radical reforms both in structure (vertical separation) and ownership (privatization): moreover, both reforms were undertaken simultaneously and within an unusually compressed period of time …"

"… The transition period from public to private and from integrated to separated was rough, and suffered from the haste of the process …"

"… Both restructuring and private sector involvement remain viable options; but, neither is a panacea and implementing either requires care …"

"… Quick fixes do not work, and they often make the original problem even more complex. Bank clients should aim at simpler solutions than in the UK and, if possible, they should take more time in reaching them… "

Privatizing British Railways – Are there lessons for the World Bank and its borrowers?, Lou Thompson, Sep 2004

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What is horizontal separation and what issues does it seek to address?

What is horizontal separation (HS)?

- According to DfT's ITT for this project, the horizontal separation option would involve *"the sale of one or more routes or regions of Network Rail to a separate company"*
- However, the ITT recognises that *"there would probably be a need for a system operator, which would coordinate national functions such as timetabling"*
- L.E.K. has considered horizontal separation as a journey which begins with devolution within NR, and then may progress to concession or sale of one or more regions

What issues does HS seek to address?

• NR has a monopoly position and does not have any close comparators. As a result, it does not face the level of external pressure required to ensure that it is responsive to its customers and delivers VfM for its funders and customers	✓
• Further issues result from its current highly centralised management approach - Reduced rate of innovation - Slow decision making in some situations - Harder to achieve locally optimised solutions	✓
• Misalignment of incentives between NR and train operators inhibits whole system optimisation based on market demand	X
• Cost of interface between NR and train operators (additional resources and slower decision making)	X

The current industry structure and NR's governance arrangements give NR a position of great strength in the industry without the external pressures required to ensure that it delivers for its funders and customers

ORR

Responsible for regulating NR but assessing NR's performance and efficiency is relatively difficult due to the lack of close comparators

Ownership and Governance

NR is a CLG. It is in the private sector but has no equity or shareholders. It can make a profit but cannot pay a dividend. NR's Board is held to account by a diverse group of c.100 members, the majority of which are drawn from the general public

DfT and other funders

Responsible for specifying NR's outputs and funding its revenue requirements. Desire to keep NR off-balance sheet limits level of control that government can exercise. DfT has right to appoint a Director of NR but has not done so

Suppliers

NR is either the largest, or one of the largest, customers for many of its suppliers. Furthermore, it is the (near) monopoly buyer of some products in the UK. This puts NR in a position of strength relative to its suppliers

Network Rail

Monopoly owner and operator of the national rail network

Customers

Relatively fragmented - 19 franchised passenger TOCs, 4 open access passenger operators and 4 main FOCs. NR's position further strengthened by relatively short length of many franchises and pass-through nature of some charges. Protected from NR's efficiency trajectory by Schedule 9 (and similar provisions)

Substitutes

Main substitutes are other modes, particularly road and air based transport. However, strong government commitment to rail due to environmental and broader economic benefits

Competitors / comparators

No direct competitors for many activities. Although DfT/ORR are trying to increase contestability of some activities. Main comparators used for efficiency assessments are other European railways several of which are state owned

There are a number of potentially significant benefits from horizontal separation

Regional focus

- Decentralised authority permits faster decision making for local issues
- Easier to take all relevant local factors into account in planning, decision making and implementation because managers would report to a regional leadership team rather than to different central functional teams
- Facilitates building of deeper relationships with regional customers. Relationships would be between parties of more equal size and the TOC managers would have more confidence that the Regional IM managers could implement any agreements
- Facilitates a range of vertical alignment and vertical integration options

Competition

- Competition is a powerful driver of innovation and performance improvement
- Horizontal separation could facilitate competition through a number of mechanisms:
  - Reporting of like-for-like performance results using a standardised set of KPIs. This would facilitate publication of league tables in a similar way to PPM
  - Comparative regulation, with more efficient companies allowed to make a higher return than less efficient companies
  - Competition for sale of regional businesses under some ownership options

Equity ownership

- Some horizontal separation options involve private sector equity ownership
- Intensifies the impact of competition and increases the pressure on infrastructure manager to deliver efficiency savings in order to make a profit
- Could help to align incentives with customers (in conjunction with vertical alignment options)

However, there are a number of potential issues with horizontal separation that would need to be addressed

- Network-wide coordination could become more difficult
- There could be a loss of economies of scale
- Some of the potential benefits from NR's previous centralisation strategy could be lost if devolution happens too quickly
  - different approaches can be appropriate for the same organisation at different times. Is this the right moment for NR to switch from a centralisation strategy to a devolution strategy?
- Interfaces could become more expensive and difficult to manage
  - TOCs interfacing with multiple Regional IMs (impossible to get a 1:1 mapping for all TOCs)
  - Regional IMs interfacing with each other (e.g. performance impacts, incident response)
- Safeguarding sustainability could be challenging when managers are under increased pressure to meet short term targets
  - What is the risk of creating another Railtrack?
- There would be potential for greater variation in performance of Regional IMs
  - The downside of greater innovation is the risk of more failed initiatives, which could impact service quality
- If incentives are not aligned between TOCs and the Regional IMs then it could be more difficult to manage the interfaces if the Regional IM has private sector equity ownership. The Regional IM could take a highly contractual position to exploit its monopoly position and would be less exposed to political pressure to be reasonable

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L.E.K. and Frontier Economics have reviewed evidence from other sectors to develop a view as to whether horizontal separation is likely to improve VfM in the GB rail sector

Gas Distribution	• GB divided into 8 regional gas distribution networks ("GDNs") which were owned by National Grid • In 2005, National Grid sold 4 of the 8, to 3 separate owners • All 8 are regulated by Ofgem
Water and sewerage	• Ten regional water and sewerage companies privatised in 1989 • All are regulated by Ofwat which makes extensive use of comparative benchmarking
Aviation	• BAA was privatised in 1987 • It owns and operates six UK airports. It sold Gatwick in 2009 after the CC concluded that separate owners would enhance competition and cost efficiency
Highways Agency	• Three networks in GB (England, Wales, Scotland) • England is divided into 13 geographical areas responsible for maintenance, repair and improvement works • In 2009, NAO recommended that the areas carry out more comparative benchmarking to drive down unit costs
Post	• In the postal sectors there is effective competition through deregulation of the market • Internal benchmarking is used for Royal Mail
Telecoms	• Fully open to competition since 1991 • Significant competition throughout the value chain

Comparative regulation of a number of similar organisations is widely considered to be more effective than the regulation of a single national monopoly

More effective regulation

1 **Improved cost estimation**

The regulator is better able to assess the true cost function of firms and put in place challenging targets for efficiency savings in the regulated companies

2 **An impartial view of relative performance of each company**

Comparative analysis allows improved monitoring of the relative performance of each company, thus making it easier for the regulator to develop appropriate incentives

3 **A reduced risk of 'gaming'**

There is a risk that imperfect information allows monopoly companies to meet shareholders' and the regulator's demands, but hold back some savings for the future – making it easier to meet future demands. Comparative analysis reduces this risk

Company behaviour

4 **Competition**

The separate ownership and management of the businesses can also lead to improvements in the way firms operate. There is greater incentive to outperform competitors

5 **Innovation**

New management teams will also bring experience of operating other utility businesses in the UK and overseas. For example, new management approaches may introduce innovative and efficient working practices from other industries, including a wider use of information technology

Source: Oxera

Comparative regulation through inter-company benchmarking plays a significant role in setting regulatory allowances in the UK energy and water sectors

- Comparative regulation is protected in the UK water and energy sectors through special provisions
  - The Water Industry Act enforces automatic referral of proposed water company mergers to the CC
  - Several water and sewerage company merger proposals have been blocked
- However, small water-only companies have been permitted to merge because these mergers have not undermined comparative benchmarking
  - Gains from merger synergies outweigh the impact of reducing the number of comparators (and some small companies were close to failing, e.g. West Hants Water)
  - Efficiency levels at high performing small companies are a small part of the efficiency frontier
- Ofgem has estimated the cost of reducing the number of electricity DNs for benchmarking comparisons, and the reduction in independent management teams operating in the industry. For one merger (of the 14 DNs) Ofgem implemented “a one-off reduction of £32 million (in 2001/02 prices) in regulated revenue spread over five years across distribution companies involved in the merger”. The loss applies across the whole industry i.e., to all customers, whereas the remedies remain within the merging companies

When National Grid decided to sell a number of its gas distribution networks ("GDNs"), Ofgem developed an estimate of how total customer benefits would increase with the number of separate network owners

- National Grid was subject to OFT and CC enquires into the efficiency of the gas industry and 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
- They found that the greater the number of separate owners (in addition to National Grid), the bigger the customer benefits
- National Grid created 8 GDNs and decided to offer 4 for sale
- 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 for controllable opex
- The NAO considered Ofgem's assessment of the potential efficiency gains to be conservative as there could also be savings from more efficient capex

> "…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	Low case (%)	Best estimate (%)	High case (%)
No sale^	3.25	3.00	3.00
1	3.55	3.50	4.09
2	3.77	3.87	4.86
3 (sale option)	3.91	4.13	5.40
4	4.00	4.30	5.80

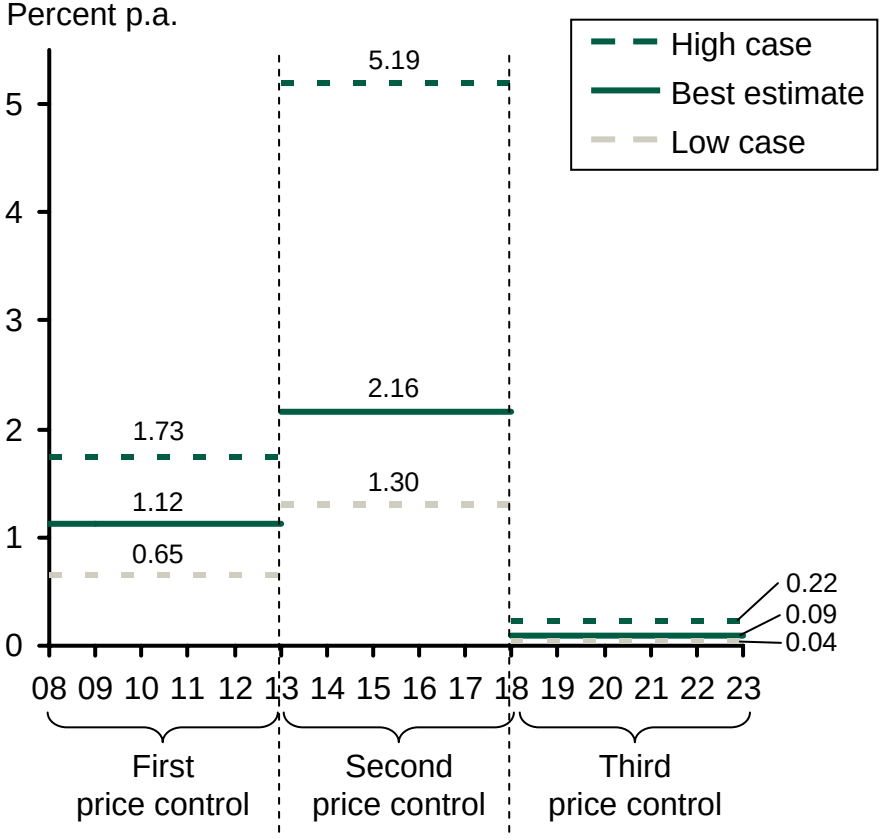
1.13% additional efficiency gain from comparative regulation

Note: * Equivalent to operations and maintenance in NR; As estimated by Ofgem in the Final Impact Assessment, 2004; ^ Ofgem's reasoning for setting a higher rate of improvement in the no sale low case vs the corresponding best estimate and high case is unclear to L.E.K.. Ofgem simply states "to reflect the potential for the impact of the separation of DN price controls to be greater than assumed in the base case and high case"
Source: NAO; Ofgem

At the time of sale, Ofgem expected the greatest efficiencies would occur after a full price control period, i.e. c. 8 years after the sale of the distribution networks

- Ofgem uses 5-yearly price controls for GDNs
- After entering discussions with the industry, Ofgem concluded that operating cost savings would not be linear but would represent a 'bell shape'
- The highest level of savings were expected in the second full price control period when Ofgem had obtained more robust information on the relative efficiency of each network
- Ofgem predicted lower levels of savings in the first period as less comparative information would be available, and much lower savings in the third price control period as the potential for efficiency gains would have been exploited already
- The efficiency improvements shown in the chart are equivalent to 1.13% p.a. for 15 years, for the best estimate
- Transition costs to the industry for separate ownership were estimated to be c. £102m (PV, base case, 2004 prices)

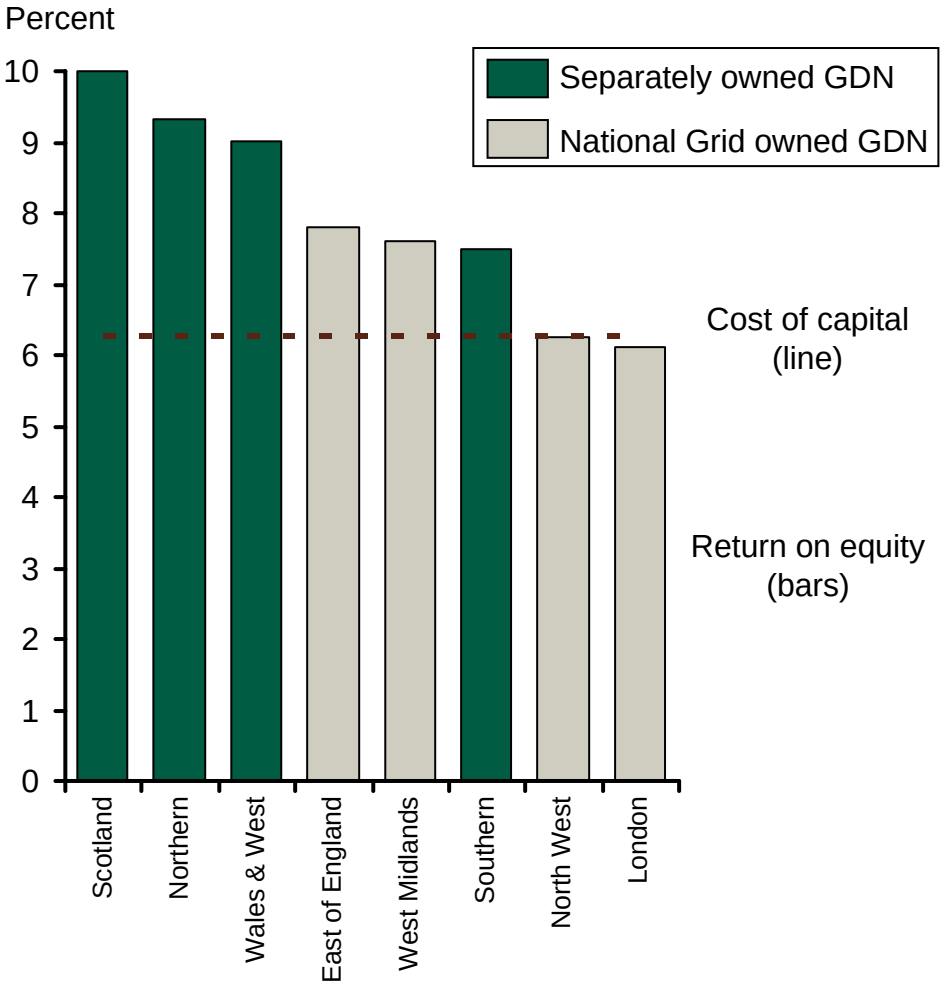
Expected timetable of incremental efficiency improvement for the sale option to 3 additional separate owners*



Note: * As estimated by Ofgem in the Final Impact Assessment, 2004. Price control periods run from April 1st; incremental to the no sale option which is assumed to be 3% p.a. for the high case and best estimate, and 3.25% p.a. for the low case
Source: NAO; Ofgem

The separately-owned GDNs outperformed those owned by National Grid in the years following the sale. Ofgem is confident that the sale improved VfM

GDN returns on equity (2007/08)



Source: First Economics; Ofgem Final Impact Assessment 2004; L.E.K. analysis

- For 2007/08, Ofgem set a one-year extension to the price controls currently active
- The majority of the GDNs had actual returns greater than the modelled cost of capital for the 2007/08 period
- Separately owned GDNs achieved some of the highest returns on equity
- It should be noted that return on equity is only a proxy for efficiency and is affected by a number of other factors
- In December 2007, Ofgem published their final proposals for the first full price control period, from April 2008 to March 2013. They were confident that comparative regulation helped them set demanding targets

  "…we are confident that our ability to establish benchmarks based on comparisons of separately-owned GDNs has allowed us to set revenue allowances at a significantly lower level than would otherwise have been the case …"

  Gas Distribution Price Control Review, Ofgem, December 2007

In the water sector, Ofwat has recognised the value of having a large number of comparators in effectively administering comparative regulation

- In December 2006, Ofwat submitted its view to the Competition Commission ("CC") that the proposed merger between Mid Kent Water and South East Water would prejudice its ability to administer comparative regulation
  - the merger was to reduce the number of independent water companies from twenty to nineteen
- Ofwat's approach to mergers is based on the following principles:
  - any merger is a detriment, prejudicing its ability to make comparisons, and diminishing the potential range of performance that a diverse group of companies displays
  - each merger permanently reduces the number of independent comparators and the impact increases for each successive merger
  - companies that are at or close to the efficiency/service frontier in more than one area are more valuable comparators
- OFWAT is currently extensively reviewing the regulatory approach in the water sector
  - possible relaxation of the merger rules are being considered as part of that review

> "…There is no finite number of comparators that will allow us to make sensible and robust comparisons. But each merger between water companies will reduce the number of comparators and, in purely numerical terms, the detriment of each successive merger is greater than the previous one.
>
> We do not consider there is an absolute minimum number of comparators, but the more independent sources of data we have, the greater our ability to make appropriate and robust comparisons. The more options there are – in terms of companies – then the more scope there is for innovation in service delivery, cost efficiency, pricing and performance. Furthermore there is less scope for hiding poor performance or colluding to the detriment of customers…"
>
> Ofwat's initial submission to the CC following the acquisition of South East Water, Ofwat, December 2006

Source: Ofwat; Financial Times article 08/02/2011

In aviation, the recent break-up of BAA was partly motivated by the desire to increase competition

- BAA was privatised in 1987 following the Airport Authority Act 1986. It now owns and operates six UK airports and has expanded internationally
- In 2007 BAA was referred to the CC by the OFT. OFT believed that enhanced competition through having more than one owner would help create stronger incentives for focussing on customer needs (of both airlines and passengers), and cost effective expansion

  "… we consider that the lack of competition between BAA's airports in both the South East of England and Lowland Scotland may lead to higher charges, or higher yields, and ultimately higher costs than would be the case if these airports were owned by separate firms …"
  OFT, 2007

- The CC investigation concluded that separate owners would remedy the adverse effects on competition occurring in airports in the South East

  "… A principal effect of rivalry between the airports under separate ownership would be to compete with each other through innovation and capacity development, a process which will of itself bring benefits as well as erode the current constraints on competition …"
  CC, 2009

- Since the sale of Gatwick in December 2009, it has been possible to make clearer comparisons of service quality. Understanding performance in this way may assist the CAA dealing with some of the CC's points of criticism, such as more effectively facilitating negotiations between airports and airlines
  - a recent example from winter 2010 was that Heathrow's management were slower to re-open its runways after snowfall than Gatwick's. This was heavily reported by the media, and led to the CEO of Heathrow losing his job
  - with common ownership it would have been easier to argue that "it is the wrong kind of snow" and to respond with less urgency to customer needs
  - however, it is worth noting that the CC investigation is still ongoing

Source: OFT reference to the CC (2007)

The Highways Agency is under pressure from the NAO to improve VfM using comparative benchmarking with Scotland and Wales and across its geographical areas

- In GB, the motorways and trunk roads network is managed by 3 separate bodies
  - Highways Agency ("HA"), for England
  - Welsh Assembly Government, for Wales
  - Transport Scotland, for Scotland

- The HA in England is split into 13 geographical areas
  - each area has a Managing Agent Contractor (MAC) who is responsible for carrying out minor maintenance, repair and improvement works

- NAO benchmarking of HA in 2009 showed that unit costs for the same activities could vary significantly between geographical areas:
  - average costs of resurfacing jobs ranged from £16.58 to £35.49 per square metre
  - costs of thin surfacing materials ranged from £63 to £101 per tonne

- The NAO recommended benchmarking between the 3 separate bodies, England, Scotland and Wales, as a way of continuing to drive future cost efficiencies, as well as further regional benchmarking within the HA

  "… A rigorous and evidence-based benchmarking of unit costs would provide a more robust basis for driving efficiency improvements …"

  "… The Highways Agency should:
  - use the cost information it already holds to benchmark unit costs of planned maintenance …
  - benchmark performance between Areas; and look at the scope for benchmarking with Scotland and Wales, and the road maintenance industry more generally …"

  Contracting for Highways Maintenance, NAO, 16 October 2009

In the postal and fixed telecoms sectors securing efficiency through regional comparators is a low priority for regulators because effective competition is created through internal benchmarking and market deregulation

	Post (Royal Mail)	Fixed Telecoms (BT)
Similarities with rail	Large regional based unionised workforce	Large national infrastructure network
Key differences to rail	No physical network Universal service obligation with a single retail tariff	Universal service obligation requiring flat rate line rental
Scope for competition	Deregulated market with low barriers to entry Zonal wholesale access price regulation for Royal Mail services	Fully open to competition since 1991 Wholesale access price regulation with geographic price discrimination
Emergence of competition	Active competition, particularly in bulk mail collection, and onward distribution Little competition yet in local delivery services. The three main reasons for this are 1. RM cost advantage as VAT exempt 2. Cost differences between regions 3. Sufficient volumes to gain economies of scale	Significant competition throughout the value chain, including in the provision of alternative national fixed telephone networks. Some local competition from cable network operators Cost is a barrier to entry on the last leg of the network, from exchange to customer. Competitors are permitted to install their own infrastructure at BT exchanges and access BT infrastructure at regulated cost based prices

Competition, comparative regulation and separate ownership are widespread across regulated utility networks in GB. Heavy rail infrastructure stands out as a single national monopoly

	Number of regional entities in GB	Number of separate owners	Comparative regulation / benchmarking
Gas	8	4	Ofgem determination based on efficiency benchmarking of GDNs with those lagging behind the efficient frontier having a more challenging cost reduction target for the following period
Electricity distribution	14	7	Ofgem determination based on efficiency benchmarking of DNOs with those lagging behind the efficient frontier having a more challenging cost reduction target for the following period
Water & sewerage	11	11	Ofwat determination based on efficiency benchmarking of regional WASCs with those lagging behind the efficient frontier having a more challenging cost reduction target for the following period. Water only companies also included in this benchmarking
Fixed telecoms	Multiple*	Multiple	Not seen as necessary because deregulated since 1991 with extensive competition throughout the value chain
Post	1	1	Postcomm does extensive internal benchmarking for Royal Mail, the only regulated Postal company. Deregulation is allowing emerging competition. Plans for privatisation are unclear
Air	14**	7	In 2009 OFT referred BAA, the dominant owner (currently 6 of 14 airports), to the CC arguing that lack of competition may lead to higher chargers. CC concurred and BAA was required to sell Gatwick
Road (motorways and trunk roads)	3	3	The Highways Agency is under pressure from the NAO to improve VfM using comparative benchmarking with Scotland and Wales and across its geographical areas
Heavy rail	1	1	PR08 set one national efficiency target. Used detailed internal benchmarking for a proportion of spend

Note: * Includes BT and other national fixed telecoms as well as a range of local networks; ** GB Airports served by NATS

A significant amount of academic research has found that horizontal separation and comparative regulation have improved cost and operational efficiency

Summary of existing academic research into the impact of HS and comparative regulation

Author (year)	Key conclusions	Overall impact of HS
Preston (2001)	Concludes that regional vertical integrated contracts would be optimal, and reiterates evidence that suggest that the UK network should be horizontally separated "… Substantial horizontal separation and/or network reconfiguration is required, given findings that the optimal sized network is estimated to consist of around 2,900 route kms …"	+
Price, Brigham and Fitzgerald (2002)	Concludes that comparative regulation acts as a powerful incentive to operators, who significantly improve performance Analysed the comparative regulation systems overseen in gas and electricity sectors and notes that Ofgem and Ofwat have been reasonably conservative in setting targets and fines, in large part a pragmatic response to data limitations	+
Le Lannier (2009)	Rankings of entities in a comparative regulation regime inform the public, direct attention to underperforming entities and generates information on best practise. However, the author cautions that the methodology used for benchmarking can have a significant effect on the final ranking, and must be treated carefully	+
Sanchez, Monsalvez & Martinez (2008)	Efficiency gains from vertical separation in European rail have been significantly stronger when horizontal separation has already been completed	+
Leveque (2004)	Comparative regulation reduces both industry uncertainty (of operators as well as regulators) and reduces information costs, in terms of reduced costs of acquiring performance information and the resulting improved efficiencies However, the potential for collusion between operators can greatly reduce the impact of comparative regulation. Additionally, if the separated entities were to be expected to raise funding for significant investment themselves, this would be more difficult under a HS system	+ / -

Conclusions

- In a number of other regulated sectors, comparative regulation has provided benefits in terms of increased efficiency and VfM
- There is also a body of academic literature to support this view
- These benefits derive from:
  - the ability of regulators to compare performance of different companies and to tighten the efficiency targets included in regulatory settlements
  - the ability of local management to innovate and respond to local incentives
  - increased competitive pressure
- Diversity of ownership (i.e., more than one owner being compared) is an essential part of this dynamic
- Rail stands out from other utilities as a single national monopoly
- This evidence suggests that significantly greater VfM could be achieved in rail (through setting lower access charges based on greater efficiency) with the use of comparative regulation

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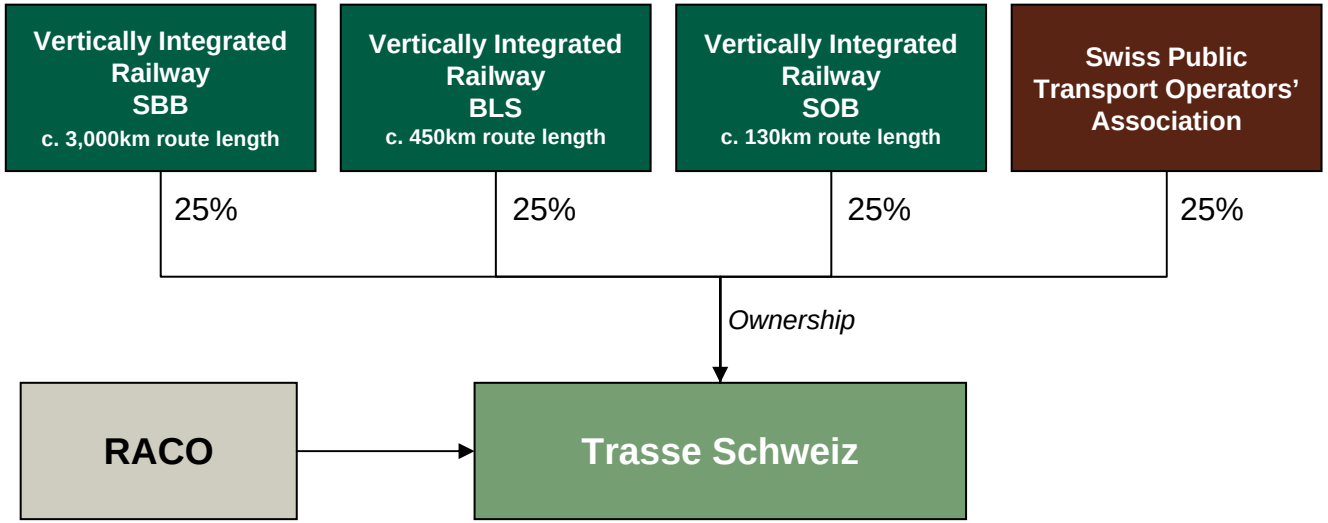
Regional and central accountability - introduction

- This section consider which accountabilities need to be devolved in order to facilitate horizontal separation of regional infrastructure managers ("Regional IMs")
- Such changes need to be considered in the context of other structural changes to the industry that are being considered by other work streams within the VfM review
  - our remit in this issue extended only to the activities within NR and whether they should be held centrally or regionally and does not cover any structured changes to ORR, RSSB or other bodies
- The section starts with case studies of three industries which have a degree of horizontal separation
  - Swiss rail industry
  - GB electricity industry
  - American railroads

Case study 1 – Swiss rail industry: The Swiss System Operator is designed to meet the needs of the infrastructure managers and train operators and this is reflected in its ownership structure

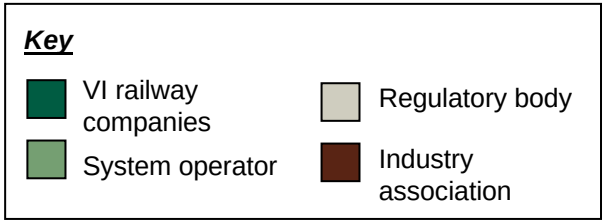


- Swiss Railways Arbitration Commission (RACO) regulates Trasse Schweiz and ensures there is no discrimination

Responsibilities

- *Capacity allocation:* handling and allocation of train paths
- *Timetabling:* guaranteeing a non-discriminatory timetable construction, and managing conflicting path applications
- *Capacity analysis of congested infrastructure:* identifying reasons for and measures to ease congestion

- Trasse Schweiz fulfils EU Directive requirements that for integrated railways there must be an allocation body that is independent legally, in its organisation, and in its decision making
  - this ownership structure would not be possible in countries that just have one infrastructure manager
- Freight traffic on SBB is c. 55% operated by SBB and c. 45% operated by other operators including BLS, SOB and international traffic
- The country is currently undergoing an internal rail reform, the outcomes of which are not yet clear



Source: Trasse Schweiz

Case study 2 – GB electricity industry: National Grid plays the role of system operator in the disaggregated electricity industry

- The electricity network is made up of the following companies
  - 3 transmission networks operated by National Grid, Scottish Power, and Scottish & Southern Energy in their role as transmission operators ("TOs"). They are involved in the transmission of electricity at high voltage from generators / suppliers to distributors
  - 14 licensed distribution network operators ("DNOs"). They are each responsible for a distribution services area which distributes low voltage electricity from transmission systems to users
  - National Electricity Transmission System Operator ("NETSO") i.e., National Grid in its SO role

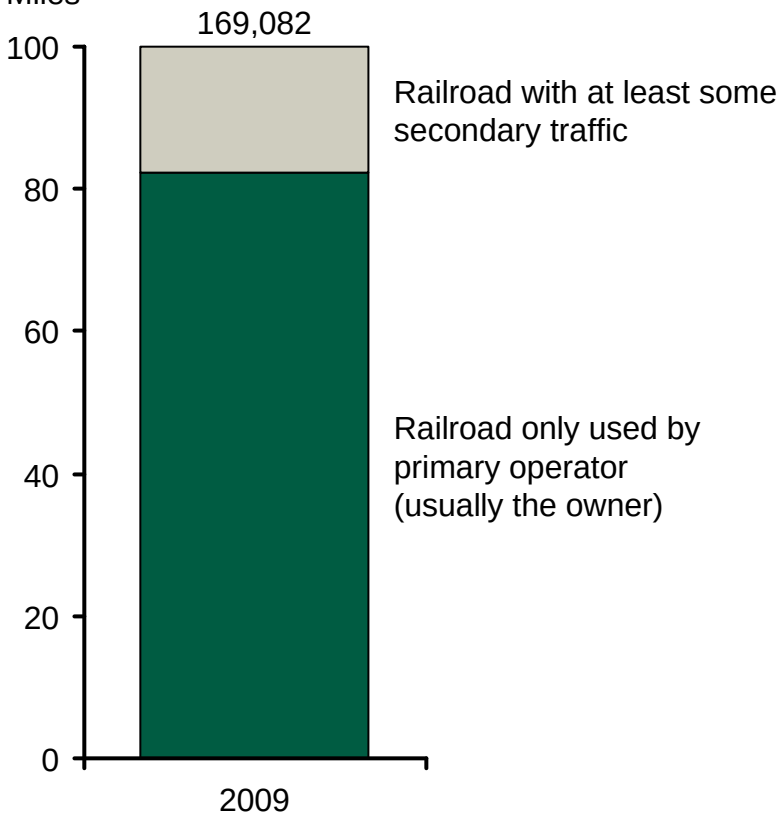
- National Grid's SO role includes
  - day-to-day system operation. This involves management of the electricity system in real time in order to match generation with demand, to minimise the impact of transmission constraints and to ensure operating efficiency
  - setting a structure of charges for use of the transmission system. National Grid operates under a statutory and licence obligation to develop an efficient transmission system
  - providing information about utilisation of the transmission grid to help inform generators' investment decisions. National Grid produces an Annual 7 Year Statement, which reflects information from users rather than National Grid's own view, in keeping with its role as market facilitator rather than as planner

- National Grid is now the SO for the whole of GB electricity market following the integration of the Scotland and England / Wales electricity markets with the introduction in 2005 of BETTA (British Electricity Trading and Transmission Arrangements)

Case study 3 – US railroads: Despite most rail companies in the USA being private and vertically integrated, there is widespread co-operation across the industry

- American railroads are owned and operated mostly by vertically integrated companies
  - despite the aggressive commercial nature of the railroads, trains can operate on track owned by other companies
  - arrangements are formed through track access rights agreements
  - these are filed with the Surface Transportation Board, which is an economic regulatory agency. It is decisionally independent although administratively within the Department of Transportation
  - railroad with secondary user traffic accounts for 18% of road miles (data is not available on the volume of secondary traffic)
  - Amtrak, the largest passenger railroad company in the USA, operated over 21,178 miles of railroad in 2009, despite only owning 654 miles of railroad

Length of Road Operated in the USA*



Source: Association of American Railroads; Amtrak
Note: *Aggregate length of roadway, excluding yard tracks and sidings and not taking into account parallel tracks. Split of secondary users based on trackage rights

NR uses the RACI framework when considering the relationship between the centre and its regions. The "A" stands for Accountability and this is the key part of the matrix to consider in terms of devolution and horizontal separation

- When considering centralised structures versus regional devolution, the RACI matrix is a useful tool and is used by NR
- The RACI matrix distinguishes between the following four roles
  - *Responsible*: The person who performs an activity and is responsible for action / implementation
  - *Accountable*: The person accountable for the correct and thorough completion of the task, including decision making and power of veto
  - *Consulted*: People who provide information through two-way communication. They are consulted before final decision is made / action is taken
  - *Informed*: People who are kept informed about progress, often those affected by the outcome of the task. They are informed after the decision is made / action is taken
- The key element of this matrix applied to NR is the location of Accountability. Due to the need to carry out activities at close proximity to the assets, most of NR's expenditure is carried out locally (i.e., there is widespread local Responsibility). However, most Accountability is currently centralised
  - a clear example of this is local Responsibility for the delivery of maintenance, but central Accountability via the Maintenance Director
  - when considering which activities should be centralised / regional we are focussing on Accountability

A number of other considerations need to be taken into account when deciding which activities to devolve and which to centralise

Stakeholder type

- There is a fundamental difference between the centralisation requirements of government / ORR and customers, and those of the Regional IMs themselves
- Autonomous Regional IMs would be free to decide for themselves which of their own needs should be centrally provided and how to manage their provision within a framework that allows for inter-operability across the country and fair treatment of all operators
- However, the requirements of the other stakeholder groups (government / ORR and customers) need more external input in any decisions to devolve or centralise in order to meet the needs of the stakeholders

Degrees of devolution

- In many cases the choice between central and regional accountability is not binary. Many activities can be subdivided into a number of lower level activities and accountability could vary between these lower level activities, i.e. there are many different degrees of devolution
- For example, some timetabling rules / principles could be centrally specified, with the individual Regional IMs left to develop compliant timetables. The rules / principles could even govern some situations where two or more Regional IMs need to coordinate with each other

Transition phasing

- In order to maximise the scope for regional regulation to drive efficiency gains, the default position should be for accountabilities to be devolved unless the benefits to the network or from standardisation or economies of scale can clearly be shown to be larger than the benefits from devolution
- However, moving from the current highly centralised management approach to a radically devolved system involves some risk. We would therefore recommend a phased transition whereby:
  - activities which have the least need to be centralised are devolved first
  - activities for which the decision between centralisation and devolution is finely balanced are devolved later, potentially through controlled trials

High level summary of current industry accountabilities

area of focus for this review

DfT / other funders

- Policy development including HLOS & SOFA
- Franchise output specification & procurement
- Franchise contract management
- Fares regulation
- Fleet co-ordination
- Client for mega projects (e.g., Thameslink)

ORR

- Safety regulation
- NR regulation
- Competition Authority
- IGC / International regulation
- Access regulation
- Assurance of sustainability

Passenger focus

- Passenger advocacy

RSSB

- Developing and maintaining Railway Group Standards
- Measuring and reporting on safety
- Managing R&D

Network Rail central

- Strategic planning
- Route planning
- Possession planning
- Capacity allocation
- Timetabling
- High-level possessions co-ordination
- Safety Plan formulation
- National IT systems & Information services
- Standards for inter-operability
- Asset management strategy
- Access charging collection and allocation
- Logistics
- User specification for large projects
- Scheme development
- Power management
- Telecoms
- Route AMPs
- Delivery of maintenance
- Delivery of renewals
- Delivery of small / medium enhancements
- Major Projects / enhancements
- Scarce resources incl. heavy plant
- Group procurement
- Property
- Engineering R&D & technical strategy
- Corporate support
- Assurance

Network Rail regional

- Signalling
- MOMs
- Control functions
- Performance management
- Data collection
- Customer services (operators)*
- Managed stations

Passenger TOCs

- Planning and marketing train services
- Operating passenger trains
- Management of stations and depots
- Franchise bidding
- Customer service
- Fleet engineering
- Management of rolling stock leases
- Rolling stock procurement

FOCs

- Planning and marketing freight services
- Operation of freight trains
- Customer service
- Fleet engineering
- Management and procurement of locomotive and rolling stock
- Terminal management

RAIB

- Investigating serious rail accidents and incidents
- Making safety recommendations

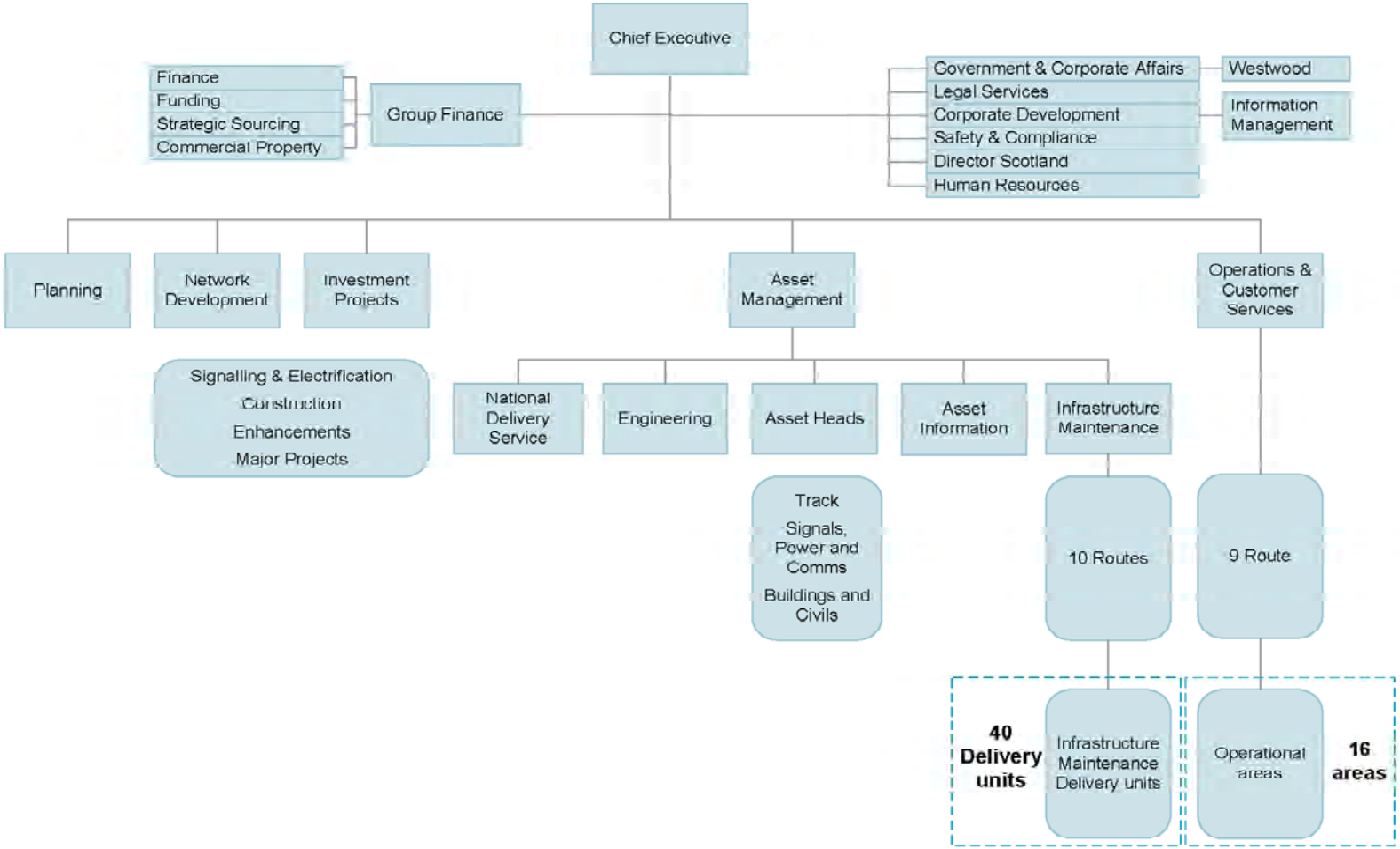
ATOC

- Rail Settlement Plan
- National Rail Enquiries
- Through ticketing
- National marketing (e.g., Railcards)
- Trade association/policy activities

Note: * Includes management of track access and franchised stations access

NR currently has a relatively centralised organisation structure with operations and maintenance reporting separately to the centre

NetworkRail



Source: NR

NR has laid out ideas for 'radical evolution' to facilitate cost efficiencies. These include devolution

NR's devolution proposals

Devolution

- Nine locally based teams with operational and asset management accountability
  - Agree high level outputs and funding requirements with central team
  - Agree scope and impact of national initiatives (e.g. operating strategy) with central team
  - Working with train operators, develop and implement operational and asset management plans that deliver required outputs on a minimum whole life whole system cost basis
- One centralised Network Management, System Operations and support activity:
  - Establish asset management framework, asset policies and asset information requirements for the network and agreeing high level outputs requirements with local teams
  - Developing national initiatives that cross regional team boundaries
  - Carrying out assessment activities as required to ensure that regionally based teams are operating within agreed framework and not compromising future sustainability
  - Providing procurement, project management, timetabling, logistics, and support services for local teams
  - Potentially carrying out wider role as System Authority
- This then enables a wide range of partnership arrangements at a local level

- It should be noted that NR is now actively following a devolution strategy and refining its proposals, processes and structures as it progresses
- As such, the material contained in this presentation may become superseded by events

Source: Devolution within Network Rail, draft 19 January 2011 (NR)

We interpret NR's radical evolution to result in devolving accountability for Route AMPs and delivery of maintenance, renewals and small / medium enhancements. Asset management strategy would remain central but route teams would have more autonomy in developing local plans

Devolved accountability – implications of NR's devolution proposals

Network Rail central

- Strategic planning
- Capacity allocation
- Timetabling
- High-level possessions co-ordination
- Safety Plan formulation
- National IT systems & Information services
- Standards for inter-operability
- Asset management strategy*
- Logistics
- Access charging collection and allocation
- Power management
- Telecoms
- Major Projects / enhancements
- Scarce resources incl. heavy plant
- Group procurement
- Property
- Engineering R&D & technical strategy
- Corporate support
- Assurance

Network Rail regional

- Signalling
- MOMs
- Control functions
- Performance management
- Data collection
- Customer services (operators)**
- Managed stations

- *Route AMPs*
- *Delivery of maintenance*
- *Delivery of renewals*
- *Delivery of small & medium enhancements*
- *Route planning*
- *Possession planning*
- *User specification for large projects*
- *Scheme development*

= incremental regional accountabilities

Note: * NR have not ruled out the possibility that this could devolve at a later stage and agree it is necessary if there were to be separate owners; ** Includes management of track access and franchised stations access
Source: Devolution within Network Rail, draft 19 January 2011 (NR)

The principles on which NR's devolution plan are based suggest the default is devolved accountability with exceptions. We recommend the rule for exceptions is strengthened

Principles for decision making

1. **Safety** is everybody's responsibility but line management is directly accountable. We will not compromise on safety
2. We manage the network in the most cost efficient way on a **whole life, whole system** basis by continuously improving our asset management policies and plans, our operating strategy and our delivery mechanisms
3. We optimise the use of the national rail **network** by balancing competing demands and developing route strategies in collaboration with our customers and other stakeholders
4. Our **customers** deal with a small number of people who have control and influence over the range of activities and decisions that are relevant to delivering a high quality and responsive customer service
5. We empower **devolved decision-making** to meet customer needs and we centralise activities only where there are clear benefits for the network or from standardisation or economies of scale
6. We **collaborate with each customer** in the most effective way to deliver services to rail users at an affordable cost
7. We **partner with suppliers** to deliver outputs for customers in the most efficient and effective way and undertake activities in-house only when it is clear that we are best placed to do so
8. We drive **continuous improvement in cost**, business performance and customer service through innovation and benchmarking
9. We are **held to account** for business performance through transparent, understandable metrics which are independently audited and supported by comprehensive business **assurance** processes
10. Reward and recognition is set to **attract and retain** high performers. Individuals can see a direct link to personal, business unit and corporate performance

13 Dec 2010

- We recommend that Principle 5 needs to be expanded to mention the efficiency benefits of devolution
  - such as comparative regulation leading to competition, greater innovation and improved efficiency
- Therefore, in L.E.K.'s view, it should read

  ".. we centralise activities only where the benefits to the network or from standardisation or economies of scale can clearly be shown to be larger than the benefits from devolution .."
- As noted in the previous section, the benefits of comparative regulation can be substantial and so this test for centralisation is a stringent one

Note: These principles are currently in draft form
Source: NR

In order to enable comparative regulation, a further set of accountabilities would need to be devolved, in particular asset management strategies and various planning activities

Network Rail central

- Strategic planning
- Capacity allocation
- Timetabling
- High-level possessions co-ordination
- National IT systems & Information services
- Standards for inter-operability (with RSSB not duplicative)
- Information services
- Access charging collection and allocation
- Logistics
- Major Projects / enhancements
- Scarce resources incl. heavy plant
- Group procurement
- Corporate support
- Assurance

Regional IMs

- Signalling
- MOMs
- Control functions
- Performance management
- Data collection
- Customer services (operators)*
- Managed stations
- Route AMPs
- Delivery of maintenance
- Delivery of renewals
- Delivery of small / medium enhancements
- Route planning
- Possession planning
- User specification for large projects
- Scheme development

Safety Plan formulation

Asset management strategy

Engineering R&D & technical strategy

Power management

Telecoms

Property

= additional regional accountabilities

= for discussion

Note: * Includes management of track access and franchised stations access

If the industry were to move to regional regulation, NR's management structure would need to change to allow for local accountability for asset management strategy which is a crucial enabler

- In order to secure the benefits of horizontal separation, regional management would need to have sufficient authority and autonomy to drive the efficiency and quality of their Regional IM
  - in Scotland some regionalisation has taken place e.g., NR Scotland has separate accounts and a separate NR manager. However, ORR has been unable to use the data for benchmarking because there is not enough autonomy
- Devolving accountability for asset management strategy to regional management is an important step in building their autonomy
- Accountability for maintenance and renewals should be devolved to regional management as part of NR's radical evolution
  - in practice, this means that local maintenance managers would report to regional heads rather than to a central director
  - resourcing such regional management teams is a key challenge for NR in achieving this level of devolution
- This change in reporting lines is an important step for regional management to be able to:
  - respond to local issues rapidly, and
  - set an independent direction for their Regional IM (within constraints set by various Central Functions)
- As a private company, NR is free to organise its business as it sees fit. However, allowing Regional IMs to be autonomous, such that ORR can regulate them separately, could potentially improve VfM significantly
  - NR's cooperation in this will be critical

"…As a point of clarity, in a well managed company with strong leadership all of the principles and consequent benefits are achievable. However, from GHD's experience achieving these characteristics is more certain under smaller financially incentivised business units with clear policy, with the scope and remit to influence all aspects of the implementation of that policy …"

GHD, Jan 2011

There are a number of different types of activity that could remain centralised

Central functions

System authority roles

Standards for inter-operability (with RSSB, not duplicative)

Signalling priority rules

System planning roles

Strategic planning, including leadership of RUS programme

Major projects / enhancements

System operator roles

Capacity allocation

Timetabling coordination

High-level possessions co-ordination

National IT systems & Information services

"Single desk" for network wide operators

Access charging collection and allocation

Regional IMs would be required by their licences to cooperate with these central functions

Support services

Scarce resources incl. heavy plant

Group procurement

Corporate support

Logistics

Assurance

Regional IMs could potentially opt out from purchasing these support services

Devolved activities

Signalling

MOMs

Control functions

Performance management

Data collection

Customer services (operators)*

Managed stations

Route AMPs

Delivery of maintenance

Delivery of renewals

Delivery of small / medium enhancements

Route planning

Possession planning

User specification for large projects

Scheme development

Safety Plan formulation

Asset management strategy

Engineering R&D and technical strategy

[Power management]

[Telecoms]

[Property]

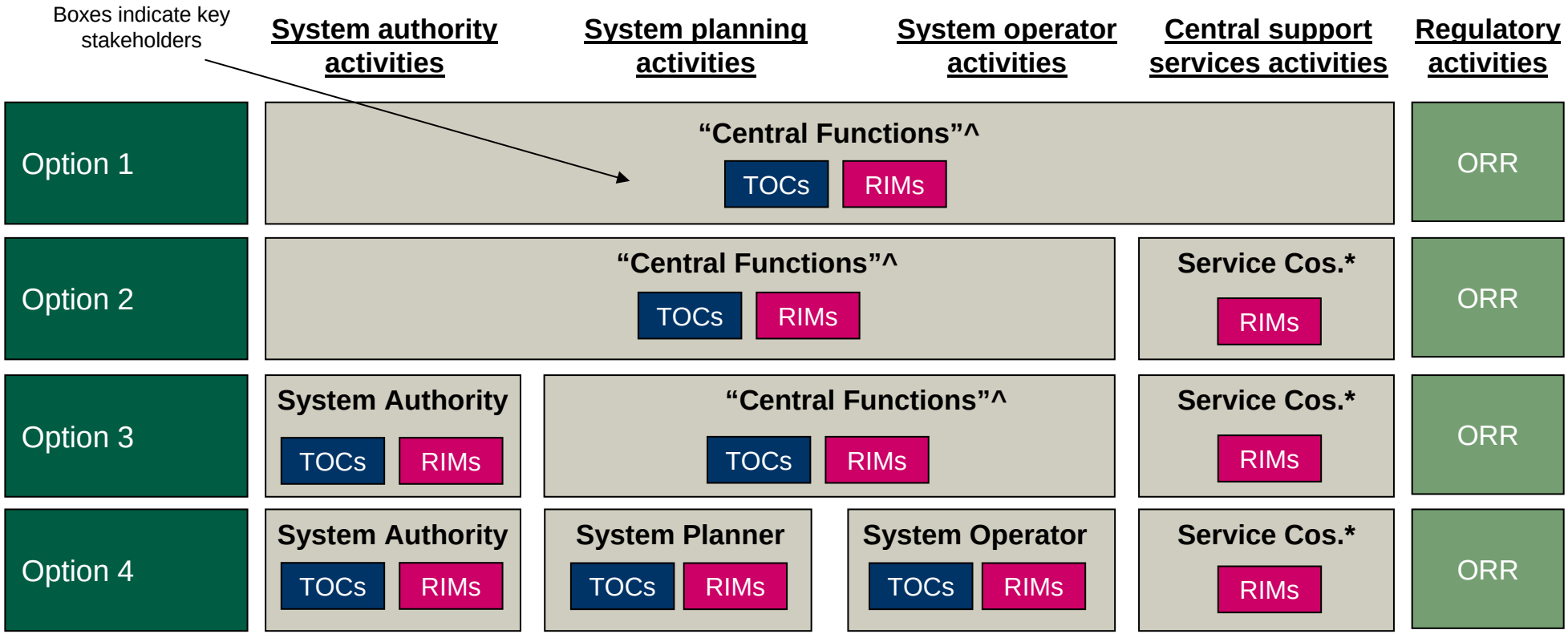
Note: * Includes management of track access and franchised stations access

The ownership arrangements for central functions should take into account for whose benefit the responsibilities have been centralised

Stakeholder group	Centralisation requirements
ORR	Management accounting and reporting protocols to facilitate comparative regulation and publication of performance league tables Activities and standards required to safeguard infrastructure and systems from a sustainability and inter-operability perspective Ensuring compliance with EU and other legislation regarding network access
Customers (train operators)	Network-wide strategic planning Seamless coordination across Regional IM boundaries in many areas including; technical standards and network capabilities for a particular type of route, delivery of major enhancements, capacity allocation, timetable development, engineering access, signalling priority rules and some IT systems (e.g. performance management systems) One-stop-shop for customer service to reduce transaction costs (particularly for network-wide train operators)
Regional IMs	Some services might be most efficiently / effectively delivered centrally. For example, procurement, IT systems, major projects, heavy plant and other scarce resources

Note: Government is also a key stakeholder in light of the level of public funding; this would be a factor in deciding ownership arrangements

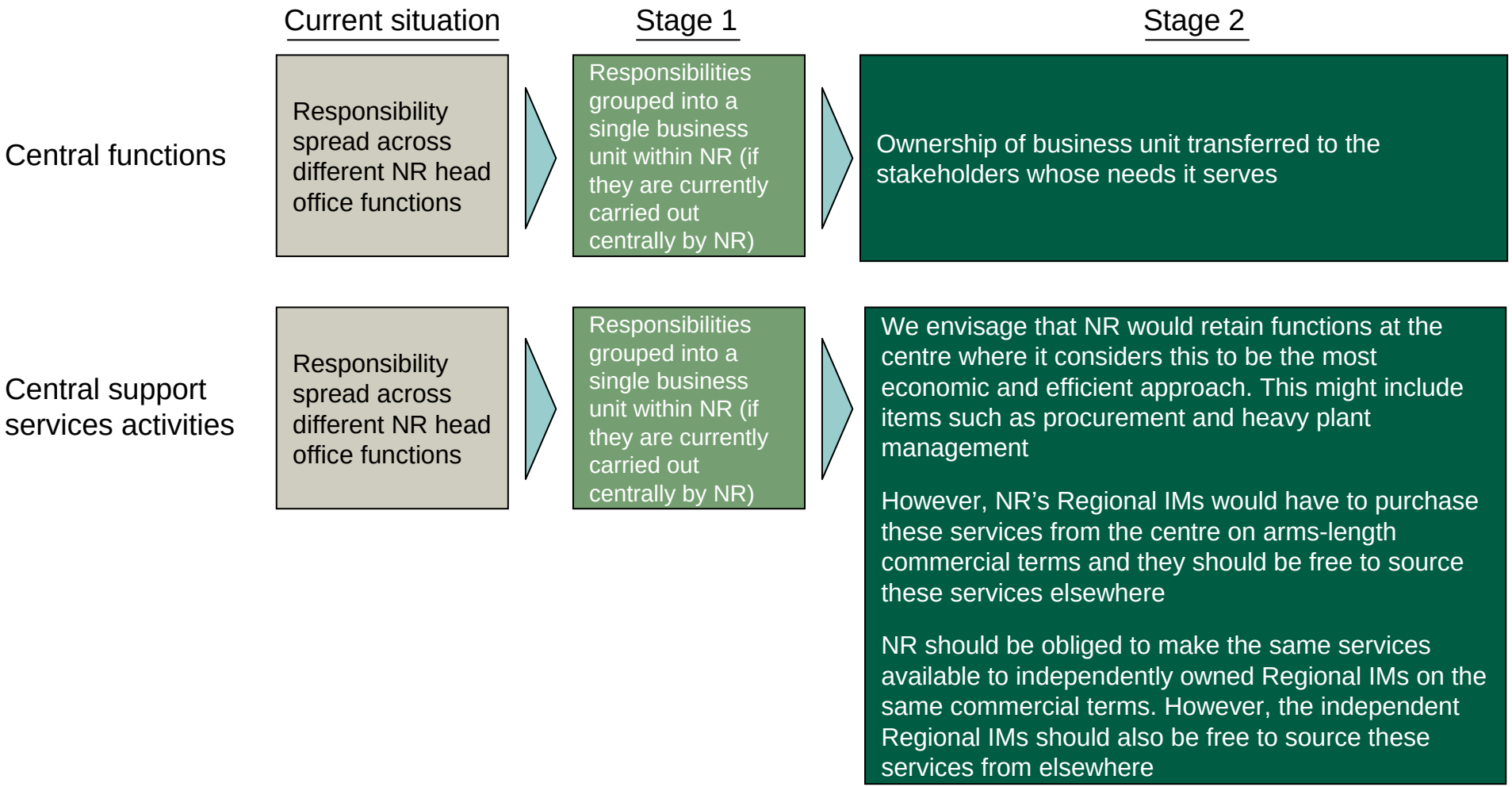
L.E.K. has identified four main options for structuring the GB rail centralised activities into organisations. The Executive Directors of each organisation would be held to account by representatives from the stakeholder groups whose interests they serve



L.E.K. recommends Option 2 as this takes into account the important difference between functions that are centralised for the sole benefit of the RIMs and those that are centralised to meet the needs of a broader set of stakeholders. Beyond that, Option 2 minimises the number of interfaces between organisations. This approach received broad support from stakeholders during L.E.K.'s workshops

Note: * This could be structured as several separate organisations. ^ All organisation names are purely indicative for ease of reference. L.E.K. is expressing no opinion as to what the actual organisations should be called

Transition arrangements could be used to reduce the risk of changing the way in which centralised activities are delivered



Agenda

- Executive summary
- Introduction
- Horizontal separation
  - Introduction
  - Benefits of comparative regulation
  - Regional and central accountabilities
  - Reporting, regulation and incentives
  - Ownership of Regional IMs
  - Geographic analysis
  - Option definition and evaluation
- Vertical integration
- Vertical alignment
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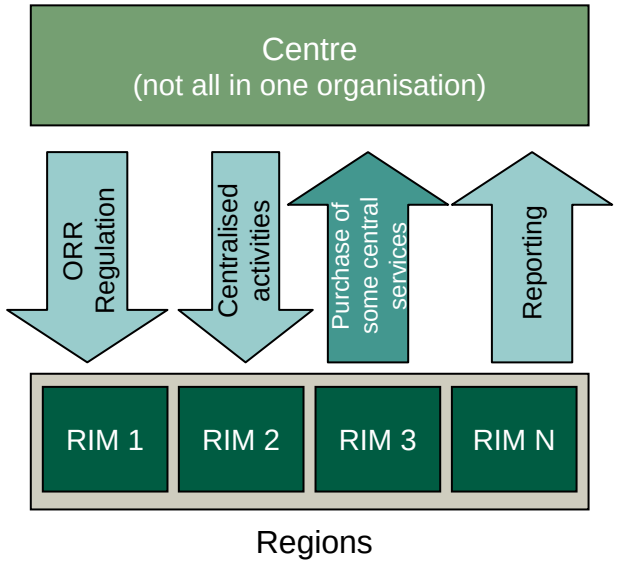
- Appendix

NR urgently needs to achieve accounting separation in order to facilitate any of the horizontal separation options

- NR is progressing with accounting separation by its 9 operating routes
  - 09/10 has been separated on an indicative basis
  - 10/11 will be separated after year end to auditable standards
  - ORR has instructed the use of operating routes for cost splits for CP5 process
- Central activities would need to be accounted for separately with the charge made to each Regional IM identified explicitly
  - costs for each central activity should also be separated
- Regional revenue (track access and other charges) can already be identified, although fixed access charges will need to be allocated using some transparent rules. TOCs could still pay to a central NR body which then allocates charges to each region (to avoid many interfaces)
- This would allow each region to be a profit centre, with profit growth dependent on increasing revenue (allowing more services, performing better etc) and reducing costs
- The regional accounts should be made public documents
- Whilst it is important to have a clear separation of the costs as soon as possible, a separated balance sheet for each Regional IM is not necessary at this stage but may be required later
  - it would be for the ORR to decide the precise regulatory requirements
- A Regional RAB would need to be defined before a Regional IM could be sold, although this could be determined top down and therefore is not a barrier to this process
- Scotland already has separate accounts but it is still managed within NR's centralised structure

Irrespective of the ownership arrangements for the Regional IMs, the reporting and regulation arrangements need to maximise the benefits of comparative regulation



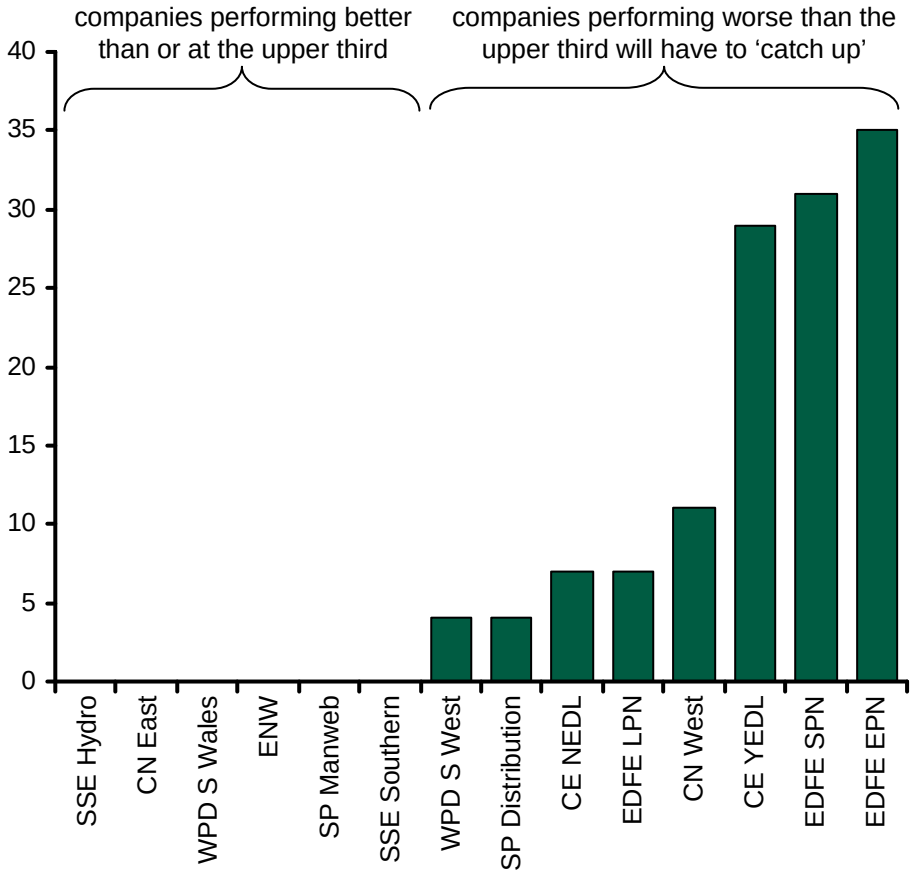
- The following principles should apply under all ownership scenarios in order to secure the benefits of comparative regulation
  - Each Regional IM managed as though it were an autonomous business, subject to a clearly defined set of centralised activities / responsibilities / accountabilities
  - Management team of each Regional IM given full P&L accountability for their business
  - We would recommend that ORR regulates each Regional IM directly rather than through NR's corporate centre, in order to maximise the benefits of comparative regulation
  - ORR assessment of efficient expenditure for each Regional IM (as it already does for Scotland)
  - ORR would retain existing regulatory powers to set access charges
  - Management accounting and reporting based on an ORR specified set of protocols
  - Publication of league tables for a broad range of KPIs covering both financial and non-financial metrics
  - Incentivisation overwhelmingly based on performance of Regional IM
- Given the scale of the change from the current highly centralised management approach, a transition period would be required to ensure that all of the regional management teams have the necessary competencies
  - disaggregation of the gas industry involved a transition period which we have taken into account when developing a timeline for the rail industry (discussed later in the presentation)

Regional management would be incentivised based on regional performance, in particular regional efficiency. The mechanism of comparative regulation would provide an additional, very powerful incentive to perform well

- Beyond the incentive to perform well each year, the structure of comparative regulation provides a longer term and powerful incentive
- For example, Ofgem publishes efficiency benchmarking results for Network Operating Costs ("NOCs") of electricity distribution companies, which impact adjustments made to that part of the spending allowance for the following control period
- NOCs makes up about a third of all operational activities, others including indirect costs and non-operational capex
- As well as ongoing frontier-based efficiency targets of 1% p.a., NOCs allowances are adjusted for all DNOs to the upper third, based on benchmarking data
  - therefore, those DNOs not in the upper third face more stringent efficiency targets, for NOCs, in the subsequent control period
  - this creates a powerful incentive to reach the top third
- An interim step towards this, involving NR owned regions, should involve as a minimum:
  - Regional IM management incentives based on regional performance i.e., changing the management bonus scheme to be based on regional rather than national metrics
  - publishing the results of regional metrics

Ofgem efficiency benchmarking results for Network Operating Costs*

PPT difference from upper third efficiency ratings (2009)



Source: Ofgem Electricity Distribution Price Control Review, Final Proposals (Dec 2009)

Note: * For Non-Operational Capex the adjustments are made to the average cost for the period 2005-06 to 2014-15, because those costs are included within the benchmarking

The sustainability and inter-operability of fixed infrastructure could be safeguarded through four mechanisms

Mechanism	Description
Central standards	One of the centrally retained responsibilities should be the maintenance of a set of standards which are specifically focussed on safeguarding infrastructure and systems from an inter-operability perspective These standards should go no further than strictly necessary to achieve this objective In practice, standards are in place already. Only standards for new or upgraded systems will be relevant 'Network Change' (a section of the ORR approved Network Code) should protect operators from (hypothetical) more restrictive changes
ORR powers	In the case of disputes between operators and Regional IMs the ORR would continue to have a role. For example, when new fleets are to be introduced, the ORR would be required to ensure Regional IMs treat operators fairly
Approval of asset strategies	Each Regional IM would be responsible for developing its own asset strategies and plans. As at present, ORR would approve asset strategies, in particular in terms of sustainability This would help to ensure that any reduction in planned work volumes or asset condition are based on sound whole-life, whole-system principles This would be particularly important in the case of Regional IMs reaching the end of a concession term or facing financial distress
Reporting of KPIs	Regional IMs would be required to report a range of KPIs in accordance with centrally prescribed protocols. This would include both leading and lagging indicators of asset condition. KPIs would be similar to those required of NR at present, but reported for each Regional IM

Other regulated utilities such as water, electricity and gas have standards that are set by bodies made up of a wide range of industry stakeholders

	Water	Electricity distribution	Gas	Air
Who sets the standards?	BSI and Water UK	Code Review Panel	IGEM	Aerodrome Standards Department
Who owns the body	Industry Association: Funded by water and sewerage and water only companies	Industry Panel: Membership includes distribution and supply companies	Institution: Contributions made from industry bodies such as Ofgem, HSE and distribution companies	CAA
Are the standards mandatory?	No	Yes Required to maintain standards but they could be different	No	Yes
Who enforces the standards?	Technical standards are self enforced DWI enforces through output	Ofgem HSE (through output)	Self governed	CAA

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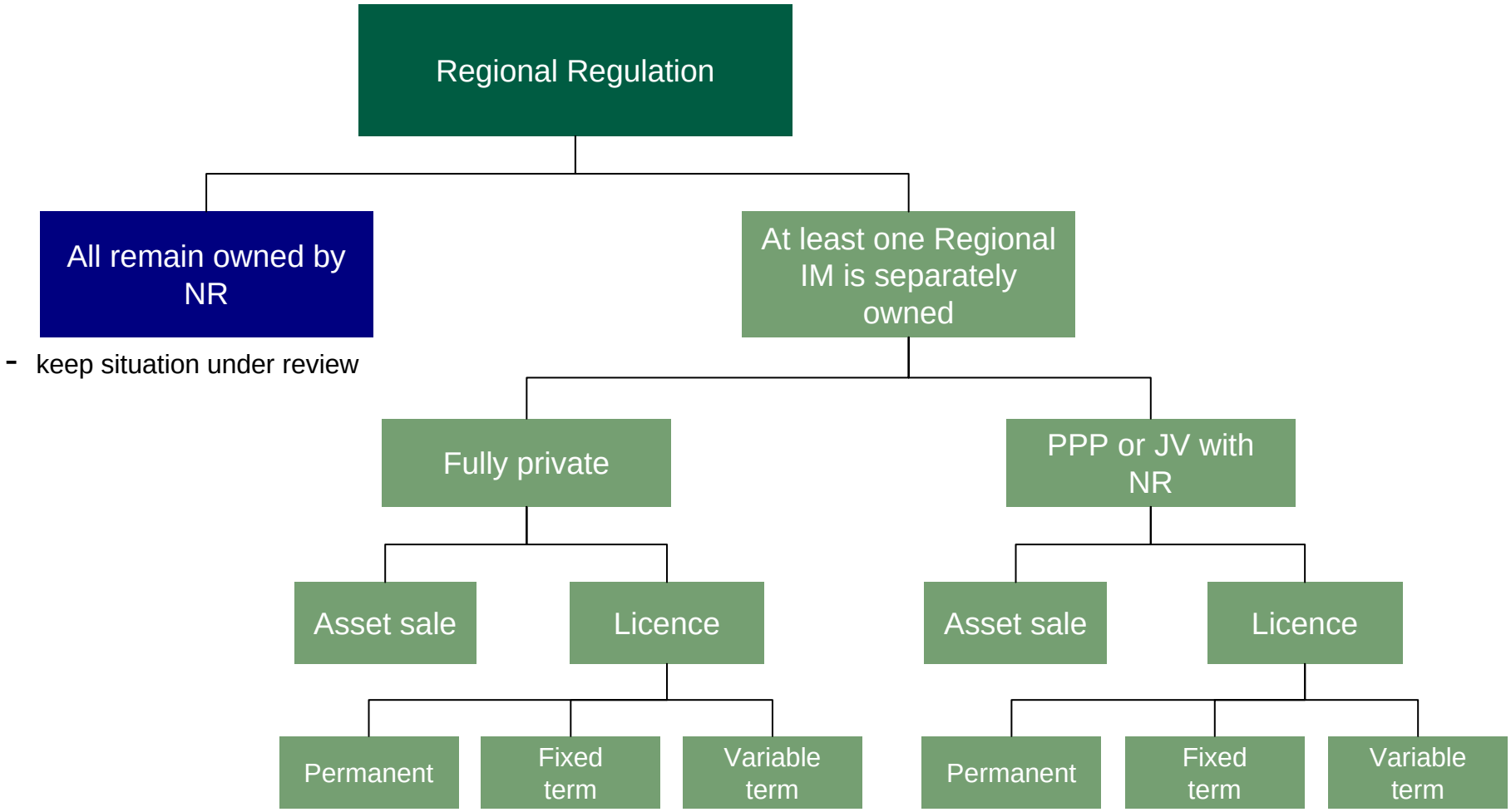
This section starts from a point where NR has devolved sufficient accountabilities that each region can be considered as an autonomous Regional IM subject to comparative regulation by ORR

Starting point: Autonomous Regional IMs

- Profit centres
- Regional management teams accountable for asset management strategy, planning and implementation
  - Locally-owned delivery plans including regional asset management plan
- Covers NR's OM and R activities (and most E) within the region
- Comparative regulation by ORR
  - Defined expenditure requirement, based on regional ORR determination for CP5
- Defined asset base
- Established arms-length contracts with central services at NR (HR, procurement, systems etc)

The next step could be to sell one or more Regional IMs to strengthen the impact of comparative regulation

Ownership options for Regional IMs* - decision tree



- keep situation under review

Note: * Decision tree excludes Vertical Integration which is considered later

Having separate owners of Regional IMs is likely to be necessary to realise the full benefits of comparative regulation

- Having many separate owners increases the effectiveness of comparative regulation, with significant VfM potential

  "…The creation of separately owned, managed and operated gas DNs that would arise as a result of the sale of DNs, should allow Ofgem to regulate the network business on a comparative basis…[this would] generate greater incentives for improvement …"
  Ofgem Final Impact Assessment, November 2004

  "…Any company in common ownership would be 'tainted' as the same management style and techniques were likely to be applied across commonly-owned companies …"
  CC report on the proposed merger of Vivendi Water UK PLC and First Aqua (JVCo) Limited, November 2002

  - the next section on option assessment quantifies the potential benefits

- This is based on
  - sharper profit motive increases the incentive to improve efficiency
  - new management can accelerate innovation

- A number of benefits of the scale of NR would need to be protected
  - network benefits such as economies of scale should be retained by allowing the Regional IM to continue to buy certain items through national frameworks
  - NR's on-going efficiency programmes should be protected from distraction (NR is on track versus its CP4 efficiency targets) by NR senior management

- It may be harder to implement change (e.g., output requirements) with a privately owned Regional IM (without compensation payments). However the proposed structure would mitigate this through ORR regulation as at present. At each periodic review, the HLOS would define outputs for the next control period and ORR would assess the efficient costs of delivering it in each region

We expect that selling one or more Regional IMs to separate owners would significantly increase VfM

Several state owners of Regional IMs is an additional option but it is unlikely to realise the full benefits of comparative regulation

- In general, we have assumed that separate ownership would entail involvement of the private sector
- However, an additional option is the involvement of state ownership. This may be particularly appropriate in Scotland and/or Wales where devolved state ownership could be possible
  - Scotland is already a separated region in accounting terms (although it is not at this stage sufficiently autonomous to provide comparative challenge to the rest of NR)
  - Wales could be split out from the Western region (discussed later in the presentation)
- It is unlikely that this ownership structure would deliver the full benefits of comparative regulation because competitive intensity would be lower in the absence of pressure from private sector capital providers

  "… In the absence of an imperative to maximise profits, NR does not have to worry quite as much as other companies about whether or not it meets its regulatory or performance targets; the opportunities that there may be to go on and exceed and out-perform those target; or the payments of financial penalties levied by ORR in the event of enforcement action …"
  First Economics

  "… it is most reasonable to assume that a positive but relatively modest increase in cost efficiency performance – perhaps in the region of 0.5% p.a. – will result from the proposed change to Network Rail's guarantees [i.e. to limit government guarantees] …"
  Corporate form, financial guarantees, and efficiency performance: expectations and evidence, NERA, 2006
- Evidence from other sectors suggest that private owners were more incentivised than state owners
  - equity owned WASCs were in general more efficient than state owned WASCs, according to Ofwat (shown in following slide)
  - EUKLEMS* data shows that from 1995 to 2007, Total Factor Productivity in private sector services grew by 4.7% whereas for government services it declined by 12.6%
- Therefore we see this option as only a possible interim step in relation to devolved governments in Wales and Scotland but not an alternative to the market testing of private ownership of one or more Regional IMs

Note: * Uses Eurostat data which is provided by ONS; value added based

Private sector equity owned companies are ranked by Ofwat as more efficient than state owned companies

Ofwat Efficiency Rankings* (2008/09)

WASC	Water	Sewerage	Ownership
Yorkshire	A	A	Equity
Southern	A	B	Equity
Anglian	A	B	Equity
Thames	B	A	Equity
Wessex	B	A	Equity
Scottish Water	n/a	n/a	State
Severn Trent	B	A	Equity
Northumbrian	B	C	Equity
South West	B	B	Equity
United Utilities	B	C	Equity
Welsh Water	C	C	CLG
NI Water	E	E	State

- Ofwat benchmarking analysis classes the Welsh Water and state owned Northern Ireland Water as less efficient than the leading private sector equity owned water companies in England and Wales
- Ofwat do not publish the criteria used to rank companies as A to E
  - however, the range for efficiency catch up for Water companies' activities is 0% to 2.9% p.a.
- Scottish Water is not allocated A:E rankings by Ofwat but is scored as 10% behind the upper quartile for GB water companies
  - it is performing well against its regulatory target to close 80% of the efficiency gap over four years, possibly due to its low starting point
  - Scottish Water's efficiency improvements have been driven by merger synergies following the merger of the three water companies in Scotland and future efficiency is expected to be less since the realisation of the merger benefits

Note: * 'A' being the most efficient, 'E' being the least efficient
Source: "Future water and sewerage charges 2010-15: Final Determinations", Ofwat

There has been strong competition from private sector investors to acquire utility and railway businesses

Gas Distribution Networks 2004/05

- Four gas DNs sold to three consortia for £5.8bn in total
- Significant bidder interest resulted in sales at a c.20% premium to RAV

HS1 2010

- 30 year concession let to consortium for £2.1bn
- Bidders involved three other consortia submitting full offers as well as a fifth that did not submit

HSBC Rail 2010

- Sold to a consortium for £2.1bn
- Despite political risk, there were at least 4 bidders as well as others not publicly identified

LU PPPs 2003

- 30 year PPP contracts to undertake maintenance, renewals and enhancements for London Underground
- Significant bidder interest came from construction and utility companies

In order to achieve the benefits of comparative regulation, the separately owned Regional IMs should be under private control rather than being part of a JV with NR

Advantages of fully private control

Increases effectiveness of comparative regulation
- takes full advantage of private sector profit motive
- clearer opportunity for innovation

Potentially more investor interest

Confidentiality, allowing more effective competition with other NR-owned Regional IMs

Isolates NR (and hence indirectly the taxpayer) more thoroughly from private party failure

Advantages of JV with NR to own Regional IM

Access to NR skills, resources and expertise nationally not just in the region

Sharing of best practice

We expect that full private control would deliver greater VfM benefits than JVs (although JVs may have a role elsewhere in the industry structure as described later in the section on vertical alignment)

Railtrack managed the UK's rail infrastructure between 1994 and 2002. The compensation requirements following Hatfield compounded contractual and organisational structural issues, pushing Railtrack into administration in 2001

- Following the privatisation of British Rail in 1994, Railtrack was established and took ownership of key UK rail infrastructure before listing on the London Stock Exchange in May 1996
  - Railtrack owned track, signalling, bridges, tunnels, level crossings and the majority of UK stations but did not own rolling stock

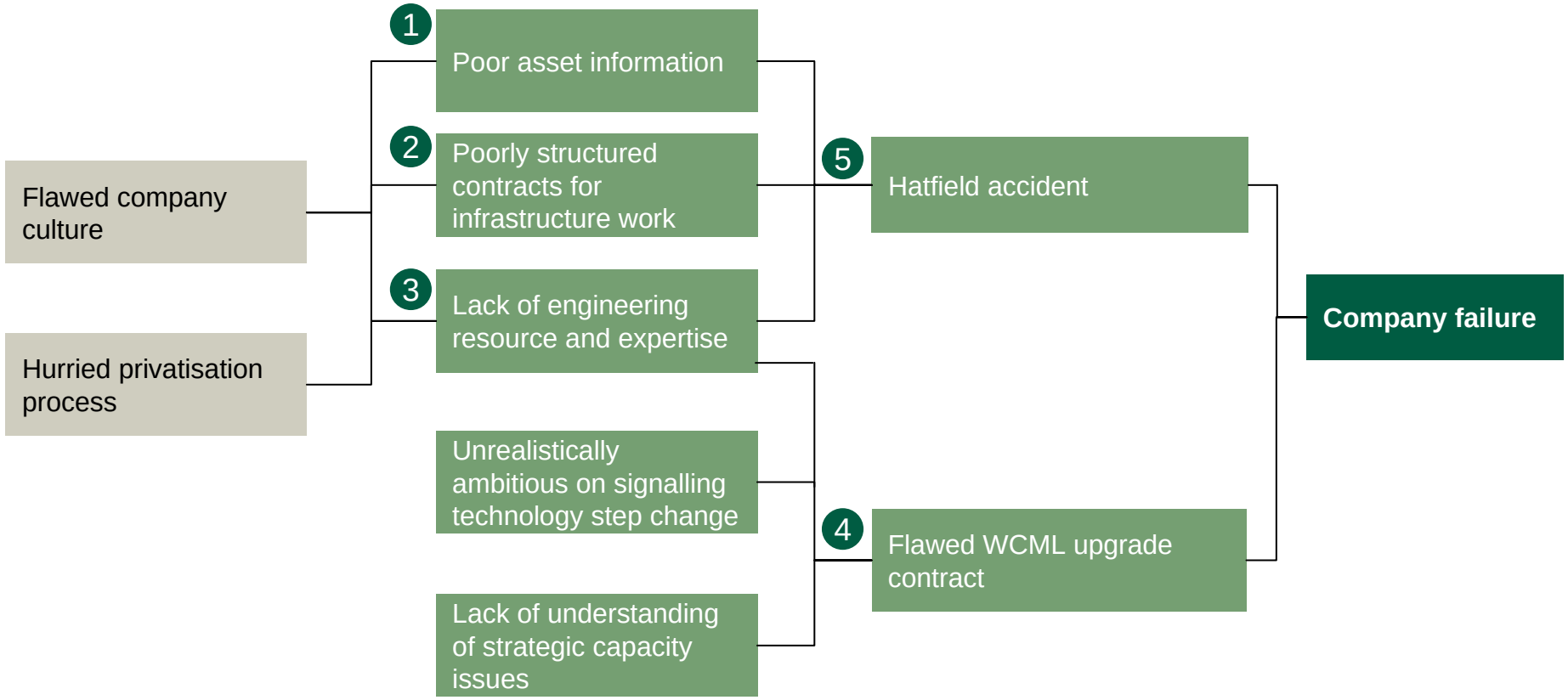
- However, the circumstances surrounding Railtrack's establishment and the subsequent form it took led to a number of significant failings
  - poor asset information was held by Railtrack
  - there was a lack of engineering expertise within Railtrack's staff
  - contracts for infrastructure work were poorly structured
  - flawed approach to WCRM led Railtrack to take on significant financial risk

- In addition, the Hatfield accident is widely viewed to have been the incident that triggered Railtrack's eventual demise
  - Railtrack imposed significant network restrictions on passenger and freight services, further damaging confidence
  - compensation payments by Railtrack of over £700m were required

- As a result, Railtrack was placed into railway administration in October 2001 and the infrastructure assets were transferred to Network Rail in October 2002

A key aim in structuring any sale of Regional IMs is to avoid repeating the mistakes of Railtrack

Key reasons for Railtrack's failure



Our approach of evolution, building on strengths of NR, not revolution would ensure the cultural issues and damage caused by hurried privatisation are not repeated

Railtrack issues

- Railtrack's company culture was flawed

  "…it was perceived by many as an arrogant monopolist in control of a vital piece of British infrastructure …"
  Thompson, 2004

- The speed of privatisation was rapid

  "… the determination to float Railtrack in May 1996 came earlier than expected. The intention here was to prevent an opposition government from pursuing a U-turn with privatisation …"

  "… there is no doubt that in 1994-7 railway operating performance was affected by the government's decision to accelerate the flotation of Railtrack …"

  "… a group of key managers began a period of extremely hard work in an attempt to meet the series of imposed and tight deadlines …"
  British Rail 1974-1997, Gourvish, 2002

- Gourvish noted that many outsiders to the industry prescribed overly simplistic and unrealistic solutions, leading to a more costly and difficult to implement system than was originally envisaged

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Current situation

- A Regional IM would start from NR's culture which is seen as risk averse and relatively mature
- Progression would not be revolutionary but instead would work with existing structures (established industry processes and bodies such as ORR, TOC franchises, HLOS, track access agreements etc would all be maintained)

Source: "British Rail 1974-1997", Gourvish, 2002; "Britain's Railways 1997-2005 – Labour's Strategic Experiment", Gourvish, 2008; "Privatizing British Railways: Are There Lessons for the World Bank and its Borrowers?", Louis S Thompson, Sept 2004

1 Quality of asset information has improved greatly with NR and could continue to do so with Regional IMs

"…the transfer of the maintenance and renewal functions from British Rail had produced a knowledge gap as well as a cultural and organisational hiatus …"
Gourvish, 2008

Current situation

- NR has made significant improvements in asset knowledge, such that ORR is able to regulate CP4 based on outputs rather than inputs

  "… we recognise that Network Rail has made sufficient progress in developing its framework of asset information systems and processes …"
  ORR Annual Assessment of NR, September 2008

  "… we welcome the emphasis on the regulation of outputs …"
  NR response to draft determinations, September 2008

Benefits of separate Regional IMs

- Regional IMs should be able to maintain or even improve asset information quality. Some asset managers believe that local knowledge plays an important part (and also as shown in the strengths of BR's OfQ structure):

  "… [With larger organisations] the line from 'collector to user' generally is less clear and as a consequence, quality of information slips when the workforce do not see the value in collecting it. It is our view therefore that in a smaller business unit, and particularly in one which has a performance incentive, the ability to collect the required information for decision making becomes much easier …"
  GHD, January 2011

Risks of separate Regional IMs

- Any risk that asset information may deteriorate should be offset by a combination of:
  - ORR setting a strong and clear duty on Regional IMs
  - Using established NR systems and data protocols, at least initially
  - Long concession term creating a very powerful incentive for the owners to adopt whole-life asset management that requires high quality asset information

2 NR has moved away from outsourcing to a mixed policy. It has mature, structured contracts for infrastructure work

"…Railtrack had little control over the structure and levels of the contracts and was not able to ensure their manageability when the contracts came into force …"
Thompson, 2004

Current situation

- NR brought maintenance in-house in 2003/04
- NR has a mature contractual matrix with suppliers

Benefits of separate Regional IMs

- Regional IMs will have more control over structuring contracts, allowing for innovation
- Regional IMs will have a clearer understanding of infrastructure requirements for their regions, due to managing a smaller business unit and being closer to the front line. Consequently, contracts can be structured in a way that is tailored to the specific needs of the Regional IM

Risks of separate Regional IMs

- Potential loss of economies of scale could be overcome by creating commercial buying groups where appropriate. A Regional IM would initially utilise NR's contracts as they applied to that region. Rational management would only change from this if it were financially beneficial
- Further competition will be created throughout the value chain because there would be multiple buying points

Source: "British Rail 1974-1997", Gourvish, 2002; "Britain's Railways 1997-2005 – Labour's Strategic Experiment", Gourvish, 2008; "Privatizing British Railways: Are There Lessons for the World Bank and its Borrowers?", Louis S Thompson, Sept 2004

3 NR has rebuilt Engineering capability throughout the company

"… Railtrack [had a] commercial approach to an engineering function …"
Gourvish, 2008

Current situation

- NR has rebuilt the engineering functions (including asset management expertise) within the company
- Core Engineering capability in NR is currently 286 people, as well as many other engineers employed elsewhere in the company
- NR currently employs 151 engineers on its graduate programme

Benefits of separate Regional IMs

- Through comparative regulation, companies with any engineering shortfalls will perform less well and will be incentivised to catch up to frontier companies
- In a smaller organisation, management will be less removed from the engineering front line

Risks of separate Regional IMs

- In the event that a buyer of a Regional IM considered that the expertise within the management team was lacking, the experience of Tube Lines bringing many secondees from Bechtel in the LUL PPP is instructive

Source: "British Rail 1974-1997", Gourvish, 2002; "Britain's Railways 1997-2005 – Labour's Strategic Experiment", Gourvish, 2008; "Privatizing British Railways: Are There Lessons for the World Bank and its Borrowers?", Louis S Thompson, Sept 2004

4 Railtrack's flawed approach to the WCML upgrade would not be repeated. Major enhancements are funded under ORR regulation and would not be devolved to Regional IMs if they had network-wide implications

"… For unclear reasons, [Railtrack] took reckless financial risks, such as offering a fixed cost commitment for upgrading the West Coast Main Line …"
Thompson, 2004

Current situation

- Major projects are negotiated, specified and funded through the HLOS process, and their funding is regulated by ORR
- This is a relatively mature process

Benefits of separate Regional IMs

- It would be easier for Regional IM management to ensure that the specification of enhancements within a region would be more aligned to regional incentives and the requirements of the region's users

Risks of separate Regional IMs

- There is a risk that large scale enhancements will be harder to manage with separate Regional IMs. The choice of which regions to sell should take this into account
- Any enhancements that impact several Regional IMs should be coordinated from the centre and some form of JV including the Regional IMs and key operators may be an appropriate mechanism

Source: "British Rail 1974-1997", Gourvish, 2002; "Britain's Railways 1997-2005 – Labour's Strategic Experiment", Gourvish, 2008; "Privatizing British Railways: Are There Lessons for the World Bank and its Borrowers?", Louis S Thompson, Sept 2004

5 Whilst it is impossible to remove all risk of accidents from the rail industry, NR has a strong and well managed safety record which would not be compromised by Regional IMs

"… Railtrack's over-reaction to this accident shattered the service reliability of the entire system …"
Thompson, 2004

Current situation	• Safety record remains strong • The risk of accidents, however well the network is managed, is inherent in railways
Benefits of separate Regional IMs	• Regional IMs would be accountable for accidents on their network • Consequences of such accidents could remain isolated rather than affecting the network at a national level because management of other Regional IMs would be able to make independent risk assessments
Risks of separate Regional IMs	• A risk premium may result from the creation of Regional IMs, to allow for the possibility of a large incident occurring in anyone particular region. To overcome this, some industry wide insurance may be necessary • Regional IMs will be less able to absorb the financial impact of an incident like Hatfield. The process for what would happen in such a case must be clearly defined

Source: "British Rail 1974-1997", Gourvish, 2002; "Britain's Railways 1997-2005 – Labour's Strategic Experiment", Gourvish, 2008; "Privatizing British Railways: Are There Lessons for the World Bank and its Borrowers?", Louis S Thompson, Sept 2004

The failure of Railtrack was due to a complex web of reasons. These reasons would not apply to the sale of a Regional IM by NR

- The key reasons for Railtrack's failure were
  - a flawed company culture and hurried privatisation process, leading to
  - poor asset information was held by Railtrack
  - there was a lack of engineering expertise within Railtrack's staff
  - contracts for infrastructure work were poorly structured
  - flawed approach to WCRM led Railtrack to take on significant financial risk, and finally,
  - the Hatfield accident

- The sale of a Regional IM by NR would not face these issues. NR has improved asset information and rebuilt its engineering function. NR now has mature, structured contracts for infrastructure work
  - a Regional IM would inherit these attributes and rational management would only move away from them if that were financially beneficial

- Major projects are negotiated, specified and funded through the HLOS process, and their funding is regulated by ORR. This is a relatively mature process

- The risk of accidents, however well the network is managed, is inherent in railways. However, a regionalised structure could mean that consequences of such accidents remain more isolated

Therefore, overall we do not believe that the failure of Railtrack raises any issues which should prevent the sale of one or more Regional IMs by NR

Longer concession terms have significant VfM benefits. An evergreen licence, regulated by ORR, similar to other regulated utilities appears to be the most advantageous option for VfM

- By selling a long licence, a significant capital sum could be raised. The new owner could raise some debt against this, but even after this would have a significant amount of equity at risk. This would have a number of advantages, such as
  - insulating the taxpayer from management failure or inefficiency
  - providing significant incentive towards whole-life optimal asset management

- The longer the concession term, the more the incentive to undertake whole-life optimal asset management is internalised rather than being enforced by regulation in shorter licences
  - a permanent licence, similar to other regulated utilities, would maximise these benefits
  - the licence terms should leave the landlord passive, in contrast to the terms of the LUL PPP which left LUL able and motivated to intervene in detail

- A concession term of 30 years (as for HS1) may not be sufficient to capture this benefit because of the mature nature of the asset base in a Regional IM. Asset renewals would be required throughout the concession term and towards the end of a fixed term the owner would require incentivising to maintain asset quality. Such a dynamic might become significant as much as 15 years before the end of a concession term, i.e., just half way through a 30 year term

- Due to the business being regulated by ORR, the key problems of long concessions are mitigated
  - its financial performance can not diverge too far or too long from expectations, mitigating risks of collapse or sustained super-profits
  - output requirements can evolve through the HLOS process and so there is no need periodically to return the asset to the state for further concession auctions

- In light of the maturity of the privatised rail sector and ORR, we would expect there to be considerable investor interest in such a permanent licence

A variable concession length model exists in certain infrastructure markets. However we do not think this is appropriate for a regulated business like a Regional IM

- A Present Value of Revenues concession model for an infrastructure asset aims to overcome some of the problems created by fixed-term concessions by enabling the contract to be lengthened or shortened based on demand. If demand turns out lower than expected then the term is extended giving the operator time to achieve their return. If demand is high, this may indicate the need for additional capacity and bringing forward the end of the franchise provides flexibility to the authorities

- The process in principle is as follows:
  - the regulator sets the allowed charges
  - bidders commit to a Present Value of Revenues that it will receive over the life of the contract, with the bidder that bids the lowest Present Value winning the contract
  - revenue is discounted at a predetermined rate specified in the contract
  - the concession ends when the Present Value is earned

- Examples of variable concession length contracts include the Queen Elizabeth II Bridge on the Thames River and the Second Severn bridges on the Severn estuary

- However, a Regional IM does not need the flexibility of a variable length concession because
  - it is far less exposed to demand risk than these examples
  - regulation by ORR will prevent the financial performance of a Regional IM diverging too far from expectations

- Moreover, a fixed length concession can be aligned with franchise or concession for operations in the case of a vertically integrated business

Business proposition for a concession

- Network Rail restructures its business into Regional IMs and then offers one or more for sale as a concession
- The concessionaire would be subject to economic regulation by ORR under the present system, modified for regional regulation as discussed earlier
  - outputs for each control period would continue to be set via the HLOS process
  - ORR determines efficient revenue requirements to give a fair return on capital if meeting efficiency assumptions
  - therefore in purchasing the RAB, the concessionaire is in effect purchasing the right to make a return on it, and the risks and rewards of performing against the efficiency target
  - if the concession can reach frontier efficiency levels (versus other Regional IMs) then it may receive a lower efficiency target in CP6 and beyond based on experience in other regulated sectors
- Terms would be agreed in the case that the concessionaire failed, which may involve NR stepping in
  - for just one region initially, this risk is manageable
- A concession could be structured as a purchase of the RAB for a fixed period of time
  - the RAB is £36bn, so a typical Regional IM (1/9th of NR) would have a RAB of c. £4bn
- Lack of a full detailed asset register is not a barrier to this because a RAB is a regulatory financial concept and is not driven purely by physical assets
  - such a RAB can be created top-down based on the financial targets for the concession
  - the RAB for Scotland was determined based on proxies for the relative proportions of assets in Scotland and the level of asset use

There are three routes to introducing private sector equity

NR cooperation

- NR agrees to sell one or more Regional IMs as part of its approach to meeting the efficiency challenge of CP5
  - this would be similar to National Grid deciding to sell Gas DNs in 2003-05
  - DfT's role as Special Member and funder of network grants may facilitate such an agreement
- Given the complexity of the process and the importance of NR management in implementing changes to industry structure, this is by far the preferred route

Competition Commission

- ORR refers NR to the CC, asking for a determination to require the sale of one or more Regional IMs by NR
  - this would be analogous to the OFT referring BAA to the CC

Nationalisation to facilitate sale

- Control of NR could be obtained via nationalisation. Doing this in order to then sell Regional IMs is a nuclear option and faces considerable practical challenges

Agenda

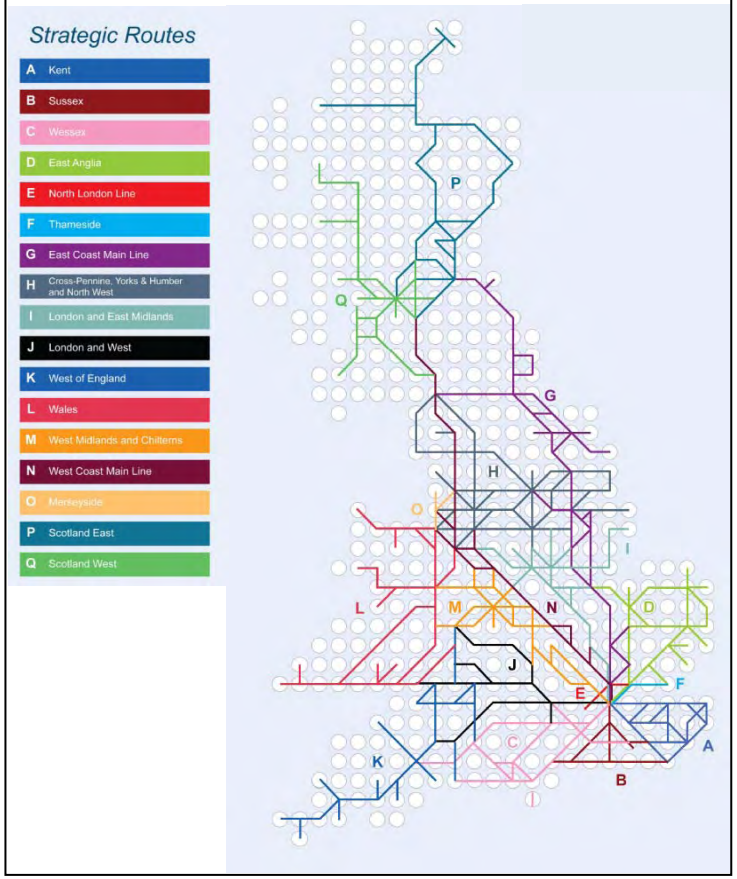
- Executive summary
- Introduction
- Horizontal separation
  - Introduction
  - Benefits of comparative regulation
  - Regional and central accountabilities
  - Reporting, regulation and incentives
  - Ownership of Regional IMs
  - Geographic analysis
  - Option definition and evaluation
- Vertical integration
- Vertical alignment
- Cost and revenue sharing
- Implementation
- Appendix

NR currently manages its business using a number of different geographical structures

- NR has historically had a functional based organisation structure with operations, maintenance and renewals managers reporting to separate head office directors
- It uses different geographic structures for different functions and purposes:
  - 9 operating routes and 16 operational areas
  - 10 maintenance routes and 40 Infrastructure Maintenance Delivery Units ("IMDUs")
  - 17 strategic routes used for planning purposes
  - 305 strategic route segments
- The 40 IMDUs map onto the 9 operating routes without crossing operating route boundaries
- There is a reasonably good mapping from the 17 strategic routes to the 9 operating routes but operating route boundaries are sometimes crossed
- These differences in geographic structures make it relatively difficult to produce regional P&Ls and NR has not historically done this as part of its standard reporting
- However, NR has recently started to generate regional P&Ls but only in relation to the 9 operating routes

NR operating routes

NR strategic routes

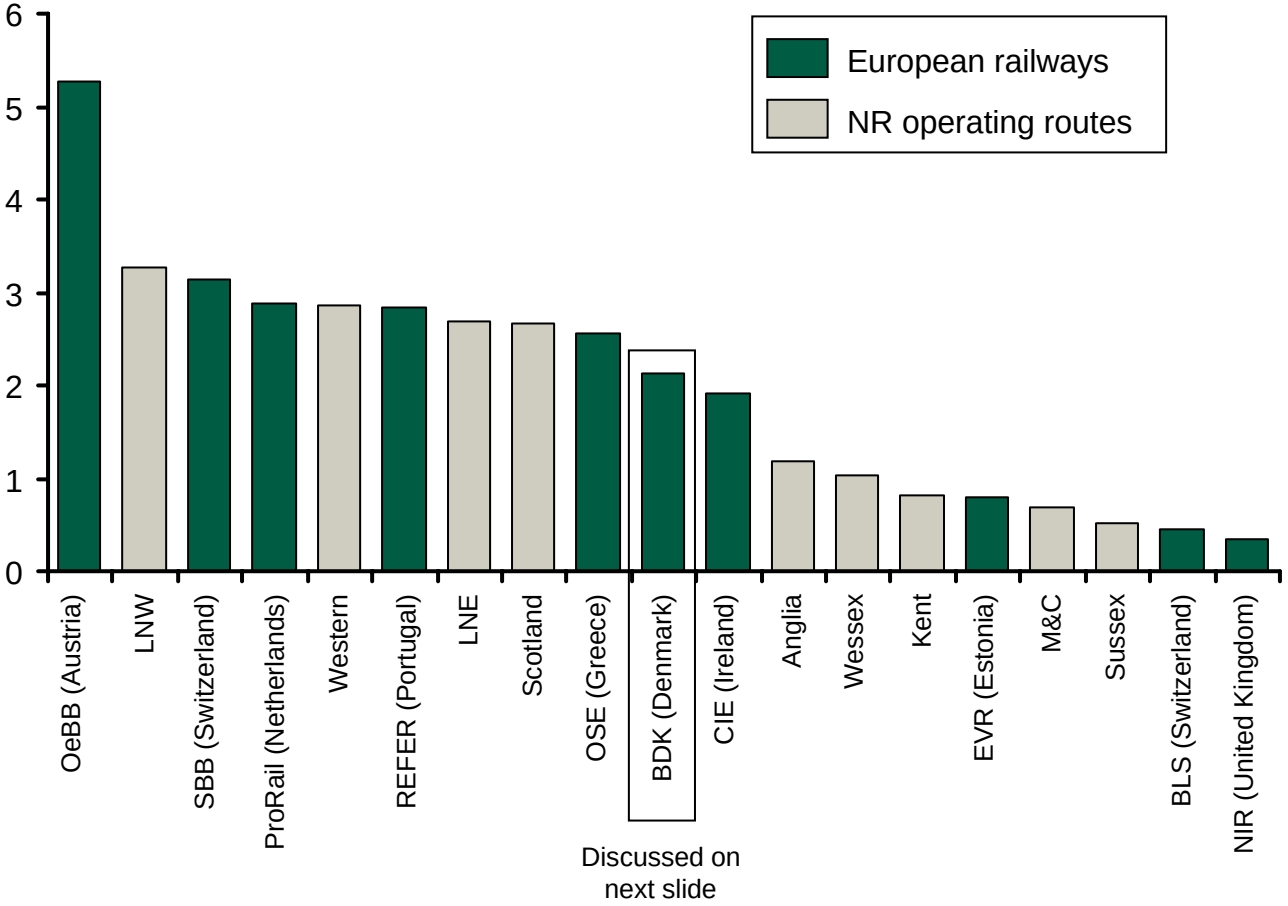


Source: Network Rail, Annual Return 2010

Many NR operating routes are of similar size to successful European railways. Achieving scale economies does not typically require scale as large as NR

Route length comparison – NR Operating Routes and selected European railways

Thousands of kilometres (2009)



- Econometric analysis by the ORR suggests that scale economies are exhausted well below NR's current national scale. Regional IMs therefore would still benefit from scale economies
- NR has already split the LNW route into two for maintenance purposes as it found the route to be too large to manage as a single entity, from a maintenance perspective
- NR is also considering splitting the Western route for similar reasons

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

Denmark's rail network is of a similar size to a NR operating route. Senior management of Denmark rail companies see many advantages in their relatively small scale

- Small scale, regional networks are seen as beneficial

  "… There are a lot of advantages of local focus (instead of a large organisation which can be bureaucratic) and that is the direction we are heading …"
  DSB [Train Operator], January 2011

- Decision making is easier for small scale railways

  "… In larger [than Denmark} railways, if you want to change something in can be very difficult and bureaucratic. In Denmark, because we are smaller, we have a relatively short link from idea to decision …"
  BDK [Infrastructure Manager], January 2011

- A NR operating route is seen as an appropriate size for coordinating workbanks

  "… We coordinate maintenance projects at the national level. But for larger countries I think that would be difficult because there would be too many things to think about. Coordinating at our size [approximately one region in Network Rail] is about right …"
  BDK, January 2011

- Issues with economies of scale can be overcome by entering commercial agreements with other rail networks

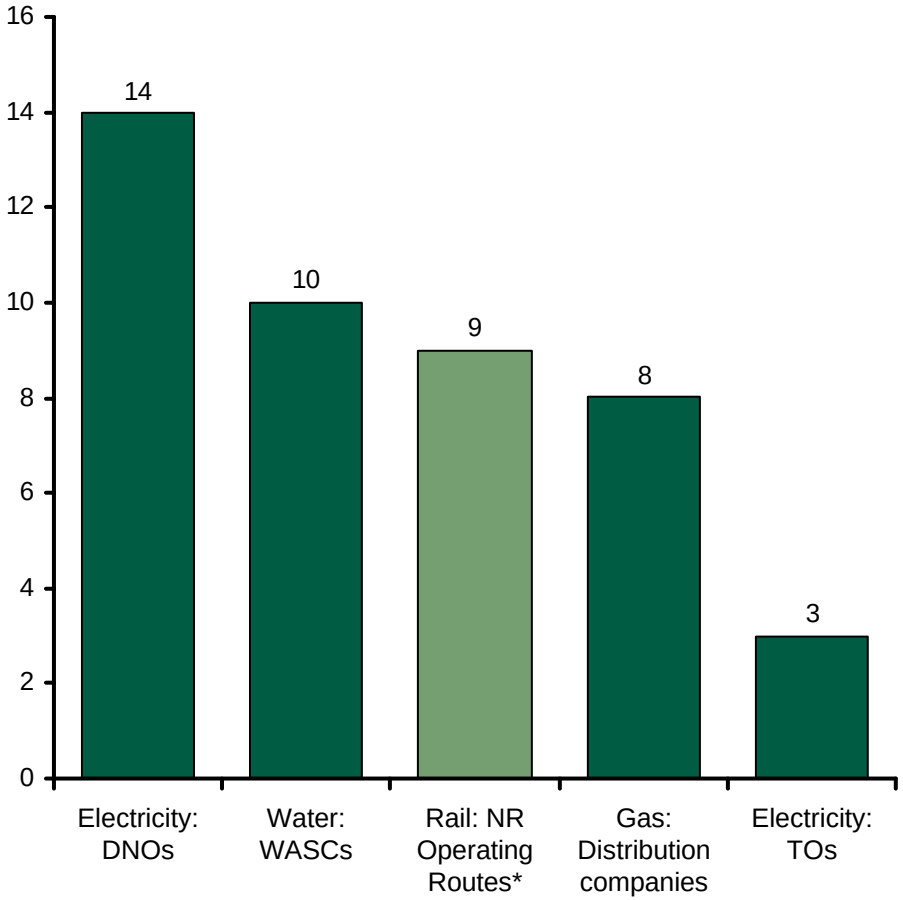
  "… We suffer from lack of scale in purchasing. We seek to overcome this with multi-year framework contracts. For example, we have closed the rail manufacturing plants in Denmark and buy from Germany. German rail manufacturing is very competitive and we get better prices than when we purchased in Denmark …"
  BDK, January 2011

- However, it is recognised that there are some activities which it is important to keep central

  "… It is important to coordinate the timetable nationally to avoid conflicts …"
  BDK, January 2011

Using NR's 9 operating routes for horizontal separation would result in a comparable number of regional networks to GB utilities

Number of regional networks for GB utility sectors



- The numbers of regional networks in GB utility sectors were originally determined by history and the geography of their networks rather than being specified by the regulators
  - the state owned Water and Sewerage company boundaries were determined long before their privatisation by the location of geographical features
- The analytical techniques employed by regulators imply that more comparators are better than fewer for regulatory purposes, however
  - ten comparators is widely viewed as being enough in the water and sewerage sector
  - eight (with four owned by National Grid) has led to significant cost reductions in gas
- NR's 9 operating routes is therefore an acceptable number of separate networks for the purposes of comparative regulation

Source: Oxera; NAO

Note: * This reflects NR's current devolution plans, but could be subject to further refinement as discussed later in the presentation

Five of NR's nine Operating Routes are relatively self-contained from the rest of the network and are closely aligned with a single dominant TOC (or two TOCs in the case of Anglia*)

Train operators' share of train km on each NR operating route** (percent)

Operator

Operating route	Train km (%)	Southern	Southeastern	SWT	First ScotRail	NXEA	FGW	EMT	Northern Rail	Virgin Trains	Arriva Trains Wales	c2c	CrossCountry	DB Schenker	Direct Rail	East Coast	FCC	First Hull Trains	TPE	Freightliner	GB Railfreight	Grand Central	London Midland	London Overground	Merseyrail	Chiltern Railways	Other	Total
	Sussex	84	1	1			2							1			11							1			1	100
	Kent	11	81											3			4				1						1	100
	Wessex	4		80			8						3	2						1							1	100
	Scotland				76					5			3	4	2	5			2	2							1	100
	Anglia					65		3				14	3	2			4			4	1			3			2	100
	Western			1			51				22		12	7						2			2			1	4	100
	M & C							49	1				15	6			23			3	1						1	100
	LNE							5	27				8	6		21	13	2	10	5	1	1					2	100
	LNW	1			1			1	16	25	5		6	4	1				5	5	1		16	1	5	7	3	100

Note: *Taking into account the possibility of NXEA and c2c being combined; ** Train kms are allocated based on mapping of operating route to strategic route section by track km; percentages less than 0.5 not shown
Source: NR; L.E.K. analysis

Given the range of different train services operated, full alignment between train operators and IM geographies is not possible. However, there are a number of areas where NR could potentially improve alignment with train operators

Potential refinement	Rationale
Creation of a "Northern" Regional IM from LNE and LNW which excludes the two main line routes	• Would enable focus on 'regional' and 'rural' infrastructure • Would map more closely with the market (Northern and TPE TOCs)
Splitting out Wales from the Western operating route	• Would help make the Western route less fragmented • Would enable FGW and ATW to both be better mapped to the routes • Would align better with the Welsh Assembly Government
Splitting out Merseyside from LNW	• The Merseyside network is almost completely isolated from the rest of the network and in some ways is more similar to a metro system than to a standard part of the heavy rail network • Merseytravel PTE has strong aspirations for this network to form part of a vertically integrated entity
Splitting out the two main lines from Scotland	• Would enable clear focus on 'main line' and 'regional' infrastructure • Would map more closely with the market (ScotRail TOC) • But may not be attractive to the Scottish Executive

However, there are a number of potential downsides of disaggregating the IM geographies, in particular:

- **Increasing the number of interfaces. This could increase transaction costs**
- **Loss of economies of scale for the very smallest regions**
- **IMDMs do not coincide with the proposed Northern IM**

By splitting out Wales, Northern and Merseyside, there is better alignment of routes and a dominant TOC (or two TOCs in the case of Anglia and Northern*)

Train operators' share of train km on each NR operating route** (percent)

Operator

Possible refinement of NR's Routes

Train km (%)	Merseyrail	First ScotRail	Southern	Southeastern	SWT	Arriva Trains Wales	FGW	NXEA	Northern Rail	EMT	Virgin Trains	East Coast	London Midland	c2c	CrossCountry	DB Schenker	Direct Rail	FCC	First Hull Trains	TPE	Freightliner	GB Railfreight	Grand Central	London Overground	Chiltern Railway	Other	Total
Merseyside	99															1											100
Scotland^		86									2	3			2	4	1			1	2					1	100
Sussex			84	1	1		2									1		11						1		1	100
Kent			11	81												3		4				1				1	100
Wessex			4		80		8								3	2					1					1	100
Wales						73	10				3				4	8					1					1	100
West of England					1		71								15	6					2					6	100
Anglia								66		3				14	3	2		3			4	1		4		2	100
Northern						2			57	6	2	1			4	6			1	17	4	1				1	100
M & C									1	51					13	6		23			3	1				1	100
West Coast Mainline^		1	1			2	1		1		34		23		9	5	2			2	6	1		1	9	3	100
East Coast Mainline^		1							9	4		33			10	6		21	2	4	3	2	2			3	100

Note: *Taking into account the possibility of NXEA and c2c being combined in Anglia, and Northern Rail and TPE being combined in Northern; ** Train kms are allocated based on mapping of operating route to strategic route section by track km; ^West Coast Mainline and East Coast Mainline taken out of Scotland as well as LNE/LNW; West Coast Mainline includes West Midlands & Chiltern; percentages less than 0.5 not shown
Source: NR; L.E.K. analysis

Network-wide operators are very nervous about the potential negative impacts of horizontal separation. To mitigate the risk, independently owned Regional IMs should only be created in relatively self-contained parts of the network and a number of key functions should remain centralised – at least in the short/medium term

- Freight and other network-wide operators are almost as nervous about the impact of horizontal separation as they are about vertical integration. They fear that the significant advantages of having NR in its current form (as described earlier) could easily be lost thereby causing a negative impact on network-wide operators
- There are three key mechanisms for mitigating the risks associated with horizontal separation and vertical integration:
  - A degree of horizontal separation can occur across the whole of the network but separately-owned Regional IMs should only be created in relatively self-contained parts of the network - at least in the first instance, until the approach has been fully tried, tested, refined and bedded down. These include Anglia, Scotland, Kent, Wessex and Sussex (see Vertical Integration section later in this presentation for key geographical recommendations)
  - Keep a number of key functions centralised to preserve network-wide benefits - again, at least in the first instance. The scope of centralised functions can be refined over time
  - Have appropriate incentives in place to ensure the network continues to meet the requirements of all stakeholders involved (e.g., protecting secondary and small operators)

Agenda

- Executive summary
- Introduction
- Horizontal separation
  - Introduction
  - Benefits of comparative regulation
  - Regional and central accountabilities
  - Reporting, regulation and incentives
  - Ownership of Regional IMs
  - Geographic analysis
  - Option definition and evaluation
- Vertical integration
- Vertical alignment
- Cost and revenue sharing
- Implementation
- Appendix

We are assessing two options for horizontal separation

Options	Definition
1. Regional regulation	• Network Rail's devolution process is driven far enough that regions can be regulated effectively by ORR on a comparable basis • ORR sets each Regional IM its own full set of infrastructure management targets including efficiency • Management of each Regional IM are directly accountable to ORR for their performance • Relative performance is published, in detail • ORR uses comparative benchmarking to assess the Regional IMs • It would be for the ORR to decide whether this option required separate price determinations, separate price controls or separate licences
2. Multiple ownership	• One or more Regional IMs are owned outside NR • A RAB could be defined for the relevant Regional IMs to give investors some view of future financial outlook • All Regional IMs remain regulated by the ORR

Within the two horizontal separation options, regional regulation is also an enabler of multiple ownership

1. Regional regulation → **2. Multiple ownership**

- Regional regulation requires accounting separation and ORR determinations by region
- These factors are a pre-requisite for multiple ownership

- Sale of one or more Regional IMs would follow a regional CP5 regulatory determination
- Further transition and ongoing costs would be required for multiple ownership, e.g., establishment of industry "Central Functions" and ongoing management of additional contractual interfaces

- The best available quantified evidence for the impact of horizontal separation has been sourced from the gas distribution industry
- As this evidence relates to both stages of the horizontal separation option, our initial focus is on evaluating the combined impact both regional regulation and multiple ownership. We then consider the potential timing of these different options

Ofgem's analysis of the gas distribution industry quantified the benefit of increasing numbers of separate infrastructure owners

- Ofgem explored the impact of different sale scenarios for National Grid's regional distribution businesses, and found the biggest driver of customer benefits to be the number of new entrants to the sector
  - Ofgem found that the greater the number of separate owners (in addition to National Grid), the bigger the customer benefits
- Ofgem developed a view of the impact of 1, 2, 3 or 4 separate owners on their ability to deliver gas distribution cost efficiency improvements to the industry, relative to its "no sale" option (see table opposite)
- For its preferred option of 3 independent owners, it also developed a view of the additional costs to the industry that multiple ownership would require in order for the cost efficiencies to be delivered

Expected annual customer benefits over 15 years (reduction in allowed controllable opex)*

	Total efficiency			Incremental efficiency above "no sale" option		
Number of separate owners	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	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

- Ofgem expected the annual efficiency benefits delivered to vary over the fifteen year period following sale in a "bell curve", with the greatest rate of efficiency gain occurring in the second 5-year control period
- The overwhelming majority of the benefits were expected to have been delivered within 10 years of separation and sale

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

We have applied Ofgem's results to the rail industry in order to identify potential benefits from the horizontal separation options

- Ofgem developed its quantitative analysis of the benefits based on total operating expenditure, covering both operations and maintenance activity
- We have applied these efficiency assumptions to the GB railway network based on the cost-saving impacts and profiles calculated by Ofgem, scaling the "bell-curve" profile that it derived for the 3-comparators case to the other ownership scenarios
- We have applied these efficiency assumptions to NR's total controllable expenditure including, both operating and capital expenditure, and believe that it is reasonable to do so because:
  - the NAO's review of Ofgem's analysis recognised that efficiency in capital expenditure was also likely to be delivered

"… Ofgem's estimate of customer benefits was calculated using conservative assumptions. 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. Ofgem believes that the introduction of comparators will also lead to significant savings in capital investment as the new owners introduce more efficient practices …"

NAO, 2006

  - separate work undertaken by L.E.K./Oxera and Oxera, analysing efficiency trends for NR in the context of other regulated industries, identified similar relationships between operating and capital expenditure efficiencies

"… Long-run trends in Real Unit Operating Expenditure and Total Factor Productivity (including capex) are similar, from which we infer that renewal efficiency changes are unlikely to be materially different from those achieved for operating and maintenance costs … "

L.E.K./Oxera, 2005

"… analysis of TFP according to the activities undertaken in each cost category suggests that firms in competitive markets make very similar productivity gains in renewals as they do in maintenance …"

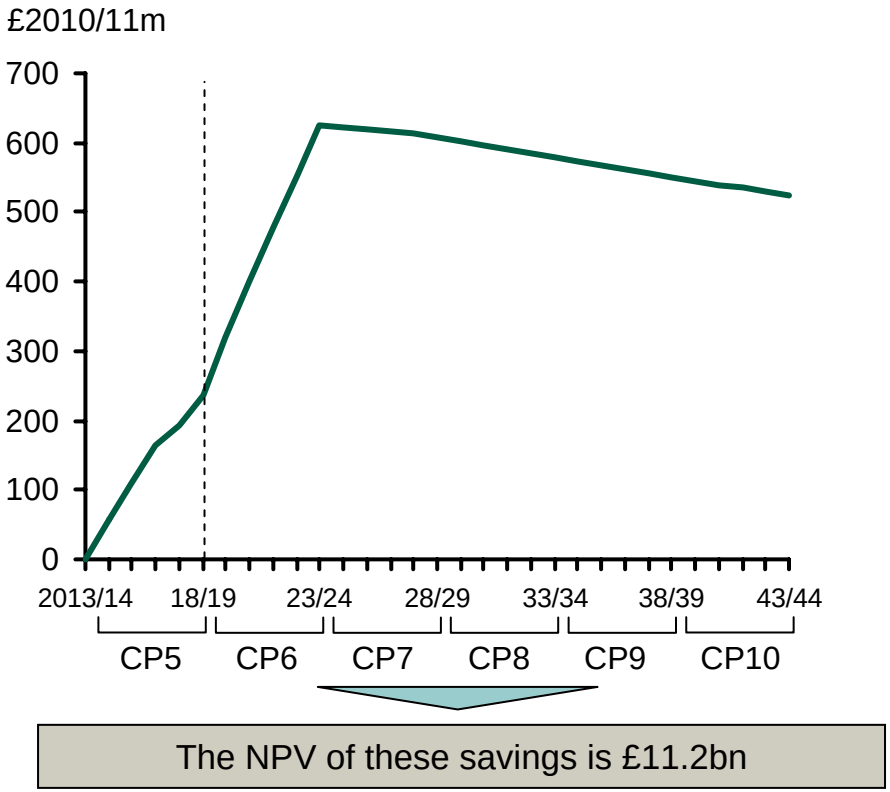
Oxera, 2008

- These benefits are incremental to L.E.K.'s baseline* CP5 out-turn, but also potentially represent a mechanism for achieving faster delivery of those savings
- The following analysis assumes that horizontal separation and sale happens during 2014/15
- Net present value calculations value the cost and benefit impacts in 2010/11 pounds, assuming that the benefits persist in perpetuity and discounted using a real 3.5% discount rate (as per HM Treasury Green Book)

Note: * Detailed in "Financial baseline and option impact quantification" section of Appendix

Ofgem's "bell-curve" efficiency improvement profile would result in the annual cost savings from having multiple owners of the Regional IMs ramping up over a 10 year period. The annual savings would reduce gradually thereafter

Potential cost saving profile from creating 3 separately owned Regional IMs at the start of CP5 based on Ofgem's "bell-curve" annual efficiency saving profile*



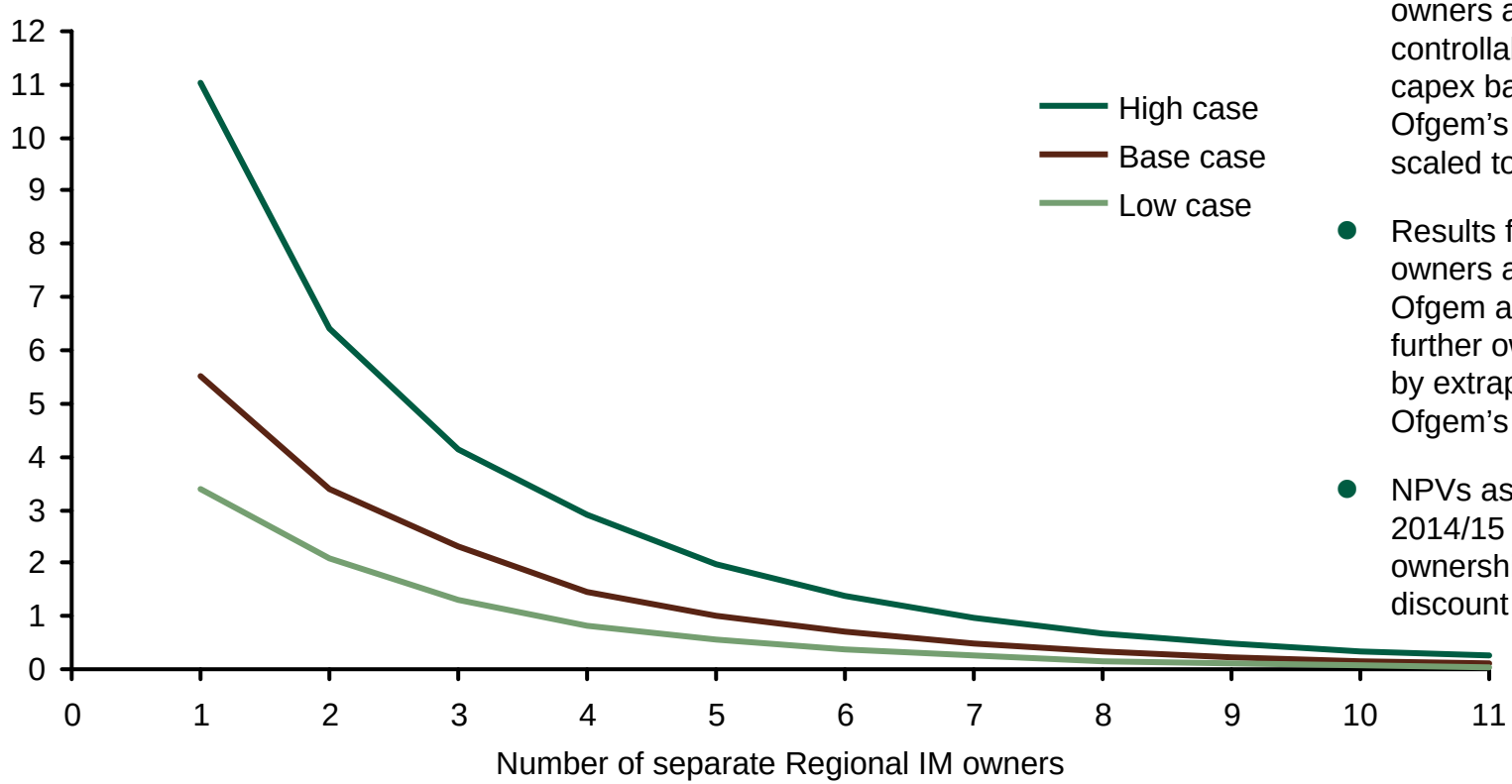
- Ofgem's "bell-curve" efficiency improvement profile shows the overwhelming majority of the improvements occurring during the first 10 years – with the annual rate of improvement being higher in years 6-10 than in years 1-5
- The annual efficiency improvements have a compounding effect in monetary terms such that the total saving in year 2 is greater than the saving in year 1
- This results in the savings ramping up over a ten year period with the rate of increase being greatest in years 6-10 as shown in the chart opposite
- Although Ofgem's bell-curve profile shows some small additional efficiency improvements in years 11-15, the chart opposite shows a reduction in the annual cost savings after 10 years. This is because the incremental efficiency savings from having multiple owners is more than offset by another effect
- Some underlying annual efficiency improvements would take place irrespective of the number of owners. Applying these same underlying efficiency savings to the scenarios with and without multiple owners of the Regional IMs leads to higher monetary savings in the absence of the multiple owners because the savings are applied to a higher (less efficient) starting cost base

Note: * Relative to NR baseline expenditure for controllable opex, maintenance, renewals and enhancements to 2018/19, declining thereafter at 1% p.a. real
Source: Ofgem; NAO; L.E.K. analysis

As the number of separate owners increases, so do the benefits, but the incremental benefits of each additional owner decrease

Indicative incremental NPV of benefits from multiple ownership of Regional IMs

Billions of 2010/11 pounds



- Chart shows range of anticipated savings for additional Regional IM owners applied to NR controllable opex and capex baseline using Ofgem's assumptions but scaled to NR's cost base
- Results for 1 to 4 additional owners are based on Ofgem analysis. Results for further owners are derived by extrapolation from Ofgem's results
- NPVs assume start date of 2014/15 for multiple ownership and real discount rate of 3.5%

	5.5	8.9	11.2	12.7	13.7	14.4	14.9	15.2	15.4	15.6	15.7
Cumulative NPV benefit (base case) £bn											

Source: Ofgem; NAO; L.E.K. analysis

A conservative estimate of the value of independent comparators can also be derived from analysis carried out by OFWAT

- In the regulated water and sewage sector, OFWAT has from time to time investigated the potential merger of companies
- OFWAT's approach to this derives from the 1991 Water Industry Act as well as the European Commission (EC)

  "… the control exercised by the UK authorities is aimed at ensuring that the number of independently controlled water companies is sufficient to allow [OFWAT] to exercise regulatory functions …"

  EC decision, from CC report on the proposed merger of Vivendi Water UK PLC and First Aqua (JVCo) Limited, November 2002

- In 2000, the CC investigated the potential purchase of Southern Water by Vivendi Water UK which already owned three companies in the UK water industry. The CC noted that the loss of a company as an independently-owned comparator would reduce diversity of management in the industry. In OFWAT's view, the merged company could no longer be used as a benchmark in future price reviews

  "…[OFWAT] submitted that a reduction in the number of independent comparators would limit the potential for innovation in the industry, thereby reducing opportunities for improvement …"

  CC report on the proposed merger of Vivendi Water UK PLC and First Aqua (JVCo) Limited, November 2002

- The CC considered that there were in general four potential consequences of the loss of a comparator
  - If it is at or near the frontier, the loss may have an impact on the effectiveness of the regulatory regime
  - changing the quantity or quality of information available to the regulator
  - changing cost-competition between companies with an affect on the promotion of efficiency
  - changing other aspects of the regulatory regime for example in the ad hoc exercises the regulator undertakes
- This same logic applies, in reverse, to the value of adding independently-owned comparators in railway infrastructure management

Source: Competition Commission

The analysis by OFWAT gives a valuation of incremental comparators that is above the high case provided by Ofgem

- OFWAT's approach to valuing the first of these four impacts involved simulating price determinations based on
  - the efficiency spread across companies seen in the 1999/2000 periodic review
  - catch-up efficiency of 60% of the gap from frontier
  - five year ramp-up of savings and sustained after one control period
  - removing the frontier company (as if it were no longer an independent comparator) and re-running the calculations
- OFWAT then applied a factor for the probability that a company lower down the efficiency rankings would at some point become the frontier – i.e., the loss represented the loss of this option
- OFWAT "considered that this analysis must significantly underestimate the damage to comparative competition through the loss of a comparator"
- It is also important to note that this refers to the value difference between 22 and 21 comparators and the CC noted that the "impact … is likely to increase with each succeeding loss". Therefore, when considering a small number of comparators, the value impact would be significantly larger
- OFWAT's NPV of loss from one fewer comparator of approximately 1/9th of the industry was £620m. When scaled to the size of NR in CP5 (£5.4bn versus water of £3.3bn in 2001) this becomes £995m
- Discounted for not necessarily being the frontier company using OFWAT's factors gives a value of £557m
- Noting that this relates to the 22nd comparator, it would be well over to the right of the scale on the earlier chart showing Ofgem's valuations, and well above the high case line

- OFWAT's valuation of incremental comparators is significantly above the high case valuation based on Ofgem

Source: Competition Commission

The incremental benefits from comparative regulation need to be compared with the incremental costs. There would be a number of different types of incremental costs

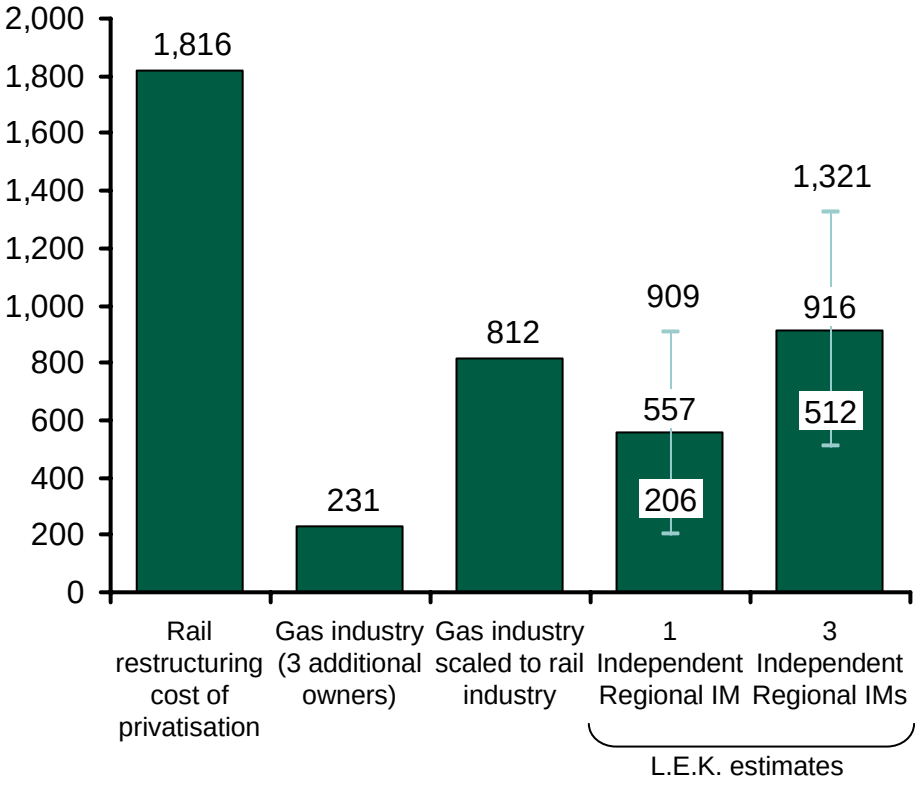
Incremental costs of horizontal separation with multiple owners

Category	Description
Interfaces	There would be additional interfaces in a number of areas. Each of which would require additional resources to manage: - Regional IM to train operators - Regional IM to Regional IMs - Regional IM to suppliers - Regional IM to Central Functions organisation - Regional IM to ORR and other governance bodies
Risk buffer	NR currently has a risk buffer of £208m p.a. to enable it to manage business risk and normal fluctuations in cash flow The volatility of cash flows is lower at a national level than at a regional level due to the portfolio effect. Therefore, Regional IMs would need larger risk buffers in aggregate in order to obtain the same level of protection as NR currently receives The approach to setting the risk buffers (and allowed return more generally) should be communicated to bidders for the Regional IMs during the sales process such that the approach is factored into the price paid for these businesses. This could lead to bidders paying a premium to the Regulatory Asset Base (RAB)
Concession selling costs	There would be a cost associated with selling the Regional IM concessions to the private sector. The DfT estimates that it cost £20-25m to sell the 30 year concession for HS1
Other transition costs	There would be a number of other transition costs, such as the cost of transitioning some of NR's current activities into a separate Central Functions organisation
Private sector equity costs	Some stakeholders have argued that there would be an additional cost as a result of the private sector having a higher cost of capital than government However, the unlevered cost of capital for a business is determined by the nature of a business, its operating assets and associated operating cashflows. These would not change simply as a result of a change of ownership Furthermore, as we highlighted in the section on "ownership of Regional IMs", introducing private sector equity would be expected to have a beneficial impact on the rate of efficiency improvement L.E.K. has conservatively assumed that there would be no net impact from introducing private sector equity

L.E.K. has developed a range of estimates of the incremental cost of horizontal separation and compared these to a number of benchmarks. L.E.K.'s estimates and the benchmarks are an order of magnitude smaller than the benefits of comparative regulation

Indicative PV of additional costs associated with horizontal separation

Millions of 2009/10 pounds



- The costs of horizontal separation would be significantly lower than the c.£1.8bn restructuring costs of rail privatisation because the scale of change is much smaller. As such, this benchmark can be considered to be an upper bound
- Ofgem estimated the cost of horizontal separation in the gas distribution industry to be £102m in PV terms (2004 prices, first 18 years only). Adjusted to give a 2009/10 value in perpetuity, gives c.£231m. Scaling for relative industry size, this becomes c.£812m for rail (with 3 additional owners)
  - These two industries are clearly very different and the scaled-up figure should be considered as little more than a sense check
- L.E.K. has developed its own range of estimates of the incremental cost of HS based on the five cost impacts described on the last slide. However, these estimates should be treated as highly indicative as they are based on a set of relatively high level assumptions rather than detailed bottom-up analysis

L.E.K.'s cost estimates and the cost benchmarks are an order of magnitude smaller than the benefits of comparative regulation

Source: Ofgem; Pollitt & Smith 2001; L.E.K. research and analysis

NR's recently announced devolution suggests that it views the benefits of horizontal separation (without multiple owners) as outweighing the costs

- Network Rail has recently announced a plan to move to a more devolved regional structure, with the Scotland and Wessex regions being the first regions to adopt this approach from April 2011

  "… Each new route managing director will, in effect, be running their own infrastructure railway business with significant annual turnover and resources …"
  Network Rail press release, February 2011

- Accountabilities to be devolved include:
  - safety
  - all customer service matters
  - asset management outputs and spend
  - operations
  - planning and delivery of maintenance
  - delivery of some renewals and enhancements

- Reasons for the change include customer responsiveness and cost efficiency

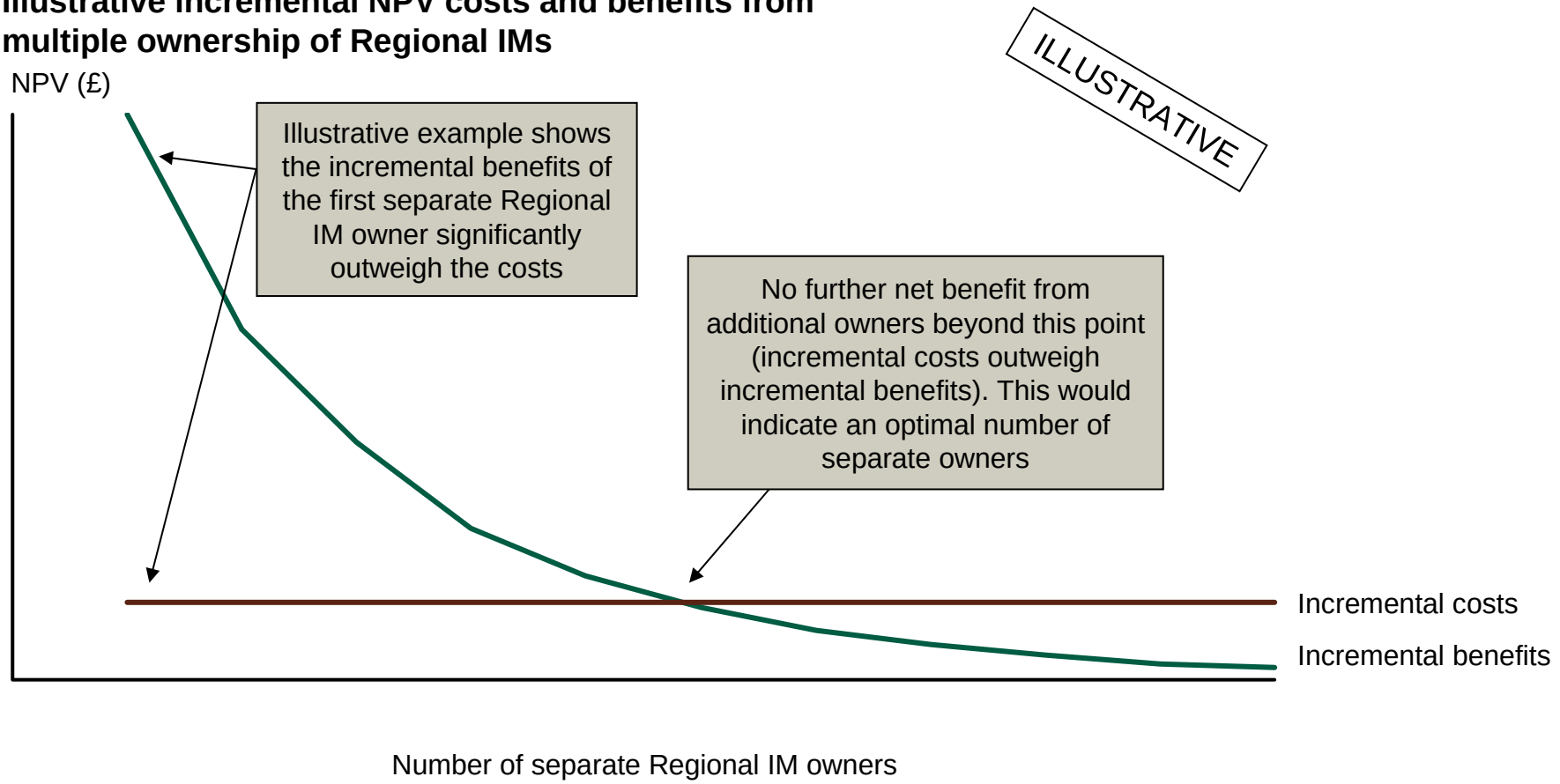
  "… The owner of Britain's rail network is poised to devolve a sweeping range of powers to its local managers, in an effort to make its operations more responsive to customers' needs and to improve cost-efficiency …"
  Financial Times, February 2011

- While the devolved scope is narrower than that envisaged for horizontal separation, the announcement suggests that NR considers the benefits to outweigh the costs, and that this can be delivered within NR's CP4 funding determination

Source: L.E.K. research and analysis

As the number of separate owners increases the incremental benefits from each additional owner reduces. There could be an optimal number of independent owners beyond which the cost of adding further owners is greater than the incremental benefits

Illustrative incremental NPV costs and benefits from multiple ownership of Regional IMs



At this stage, we recommend the following high-level approach to horizontal separation

- The industry moves rapidly to Regional Regulation
  - NR's devolution process is driven far enough that regions can be regulated effectively by ORR on a comparable basis. The precise regulatory requirements to achieve this would be a matter for the ORR to determine
  - ORR establishes regional, public efficiency (and other key) targets for CP5
  - this would create a set of autonomous Regional IMs owned by NR, with some activities retained centrally
- Some potential changes to the regions used for this purpose should be considered as a matter of urgency because NR is currently establishing regionally separated accounts and it would make sense to move quickly to allow the regional structure to mature in advance of any sale
  - NR is devolving based on its 9 operating routes. We recommend the industry considers some changes to create separate regions for Wales, Northern and Merseyside
- A number of issues need to be addressed over time such as resourcing regional management teams properly and allowing the new centre-region relationships to work
  - behavioural changes, efficiency gains and emerging issues within each Regional IM should be tracked very carefully and subsequent analysis carried out in some detail to establish the drivers of differential progress in efficiency (i.e., thorough benchmarking)
- The ORR/DfT should market test the sale of a Regional IM
  - the next section evaluates whether this should be done as part of a vertically integrated entity or separately from train operations

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