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frontier economics

Rail VfM

Alternative Railway Structures: Final Report – Volume 2

07 March 2011

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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

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- Introduction
- Horizontal separation

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- Vertical integration
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What is vertical integration and what issues does it seek to address?

What is vertical integration (VI)?

- According to the ITT, the vertical integration option would involve *"competitively tendered concessions for train operators and infrastructure management on a regional basis"*
- However, different levels of vertical integration are possible

What issues does VI seek to address?

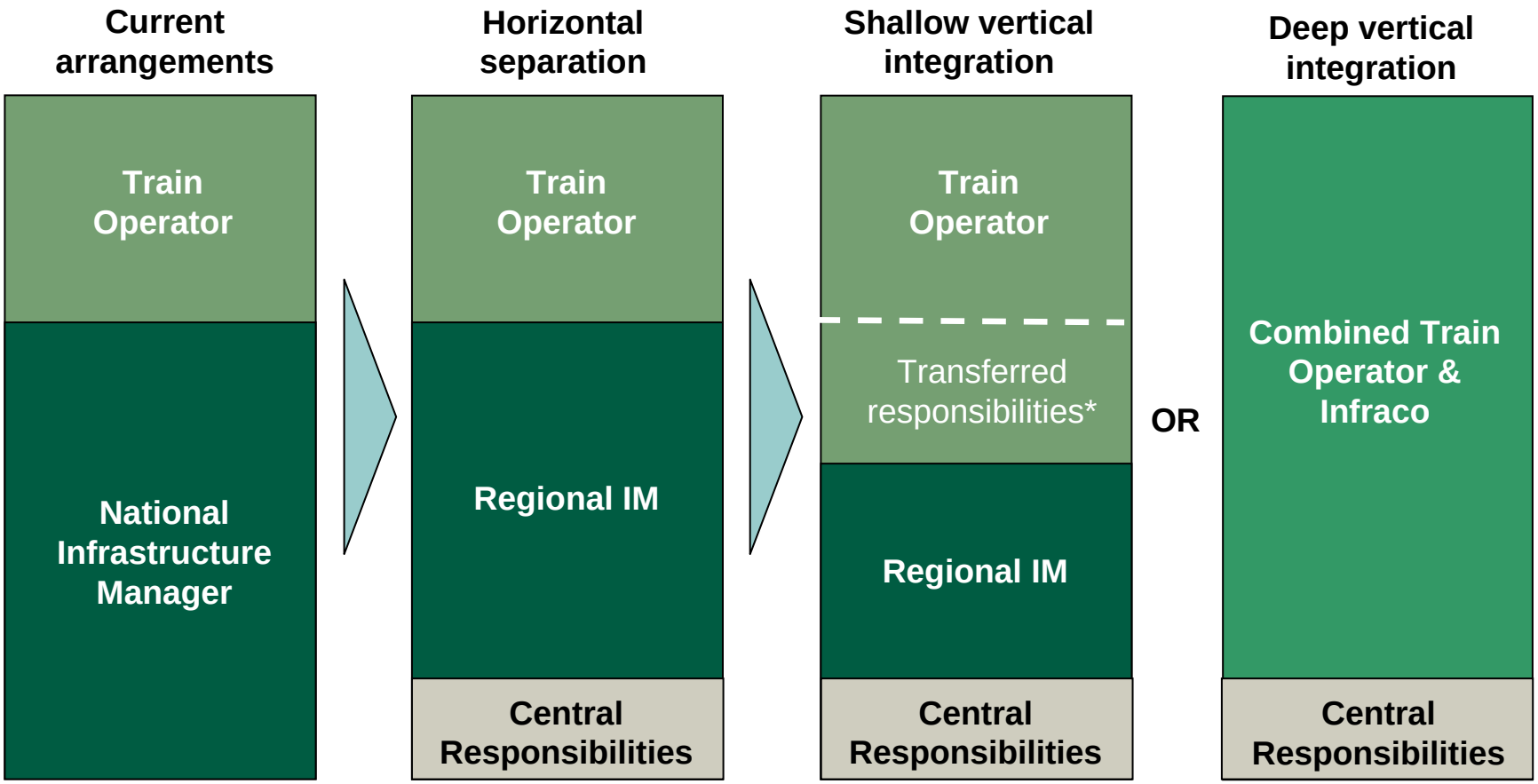
- NR has a monopoly position and does not have any close comparators. As a result, it does not face the level of external pressure required to ensure that it is responsive to its customers and delivers VfM for its funders and customers ✓
- Further issues result from its current highly centralised management approach ✓
  - Reduced rate of innovation
  - Slow decision making in some situations
  - Harder to achieve locally optimised solutions

Incremental to Horizontal Separation

- 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) ✓

It is important to note that the Vertical Integration option is being evaluated in terms of its incremental benefit relative to Horizontal Separation, not relative to the current arrangements

Different levels of vertical integration are possible



Note: *Responsibilities could also be transferred from the train operator to the regional infrastructure manager

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If the *transaction costs* associated with organising across markets are greater than the *administrative costs* of organising within firms, we can expect the coordination of productive activities to be internalised within firms

- Although the capitalist economy is frequently referred to as a "market economy", it actually comprises two forms of economic organisation
  - *The market mechanism* – where individuals and firms make independent decisions that are guided and coordinated by market prices
  - *The administrative mechanism* – where decisions over production, supply, and the purchases of inputs are made by managers and imposed through hierarchies
- The market mechanism was characterised by Adam Smith as the "invisible hand" because its coordinating role does not require conscious planning. Alfred Chandler has referred to the administrative mechanism of company management as the "visible hand" because it is dependent on coordination through planning
- What determines which activities are undertaken within a firm, or between individuals or firms coordinated by market contracts? Relative cost. If the *transaction costs* associated with organising across markets are greater than the *administrative costs* of organising within firms, we can expect the coordination of productive activities to be internalised within firms
- Improved management techniques and ICT increased the efficiency of the firm as an organising device in the 1960s and led to the emergence of vertically integrated, diversified, multinational corporations
- However, the dominant trend since the 1980s has been the downsizing and refocusing of large industrial companies as they have reduced both their product scope through focussing on their core business and their vertical scope through outsourcing activities
- Vertical integration refers to a firm's ownership of vertically related activities. The greater the firm's ownership and control over successive stages of the value chain for its product, the greater its degree of vertical integration

Source: Contemporary strategy analysis, Robert Grant, 1998

Vertical integration can occur in two directions

Backward integration

- Backward integration occurs where the firm takes ownership and control of producing its own inputs
- For example, Henry Ford's upstream expansion from automotive assembly to the production of his own components

Forward integration

- Forward integration occurs where the firm takes ownership and control of its own customers
- For example, PepsiCo acquiring its local bottlers

Source: Contemporary strategy analysis, Robert Grant, 1998

Transaction costs in the rail industry could be adversely impacted by the "small numbers problem". With a monopoly supplier and a monopoly buyer, there is no equilibrium price – it depends on bargaining

The sources of transaction costs

Sources of transaction costs	Description
Small numbers problem	With a monopoly supplier and a monopoly buyer, there is no equilibrium price – it depends on bargaining. The result is likely to be unproductive investments whose aim is only to improve the bargaining power of one party relative to the other
Disincentives for transaction-specific investments	At an integrated iron and steel complex, the two companies make investments that are specific to the particular transaction. This is a source of risk. The iron producer may be discouraged from upgrading or expanding facilities for fear that the steel producer may not make complementary investments. Transaction-specific investments give rise to the small numbers problem
Opportunism and strategic misrepresentation	If the small numbers problem exists then one party may be tempted to bargain for a better price by misrepresenting costs or product quality
Taxes and regulations on market transactions	For example, OPEC's crude oil quotas on its members have encouraged the national oil companies to forward-integrate into refining and petrochemicals as a means of cheating on their quotas

- The "small numbers problem" could apply to GB rail where some regions have a monopoly IM and a near-monopoly train operator
- The conditions listed above increase the transaction costs of market contracts and vertical integration can potentially reduce overall costs
- That is not to say that market contracts cannot be adjusted to take account of these circumstances. However, incorporating the necessary contractual provisions increases the initial costs of the contracts and may also give rise to continuing costs for contract enforcement and interpretation as well as opportunism on the part of one or other of the parties

Source: Contemporary strategy analysis, Robert Grant, 1998

However, the different nature of train operations and infrastructure management could increase the administrative costs of vertical integration

Administrative costs of internalisation

Factors impacting administrative costs	Description
Differences in optimal scale	In auto assembly, the minimum efficient scale is around 200,000 units a year. In engine manufacturing, it is in excess of one million units a year. Hence, small automobile manufacturers tend to buy rather than make engines
Managing strategically different businesses	Many of the problems of the computer and consumer electronics company Tandy may be attributed to trying to combine manufacturing and retailing within a single company. Strategic dissimilarities between businesses have encouraged a number of companies to vertically de-integrate
Developing distinctive capabilities	Specialising in a narrow range of activities helps to foster learning, innovation and distinctive capabilities
Competitive effects of vertical integration	Monopolistic companies have used VI as a means of extending their monopoly positions from one stage of the industry to another. However, such cases are rare. Once a company monopolises one vertical chain of an industry there is no further monopoly profit to be extracted by extending that monopoly position to adjacent vertical stages of the industry
Flexibility	Both VI and market transactions can claim advantage with regard to different types of flexibility. Where the required flexibility is rapid responsiveness to uncertain demand, there may be advantages in market transactions. However, where system-wide flexibility is required, a vertically integrated set of activities can offer a more effective means of achieving simultaneous adjustment
Compounding risk	To the extent that VI ties a company to its internal suppliers, VI represents a compounding of risk insofar as problems at one stage of production threaten production and profitability at all other stages

Source: Contemporary strategy analysis, Robert Grant, 1998

There has been a strong trend away from vertical integration towards more flexible forms of "quasi-vertical integration"

- When there are few buyers and sellers, where a customised product or service is being supplied, or where transaction-specific investments are needed, long-term vertical contracts can be a viable alternative to full vertical integration
  - Where the vertical relationships are especially close and long term, they are referred to as "quasi-vertical integration"
- For a contract to minimise transaction costs it must provide an appropriate set of incentives to the parties. Very often, the most effective incentive is the promise of future business. Hence, some of the most successful long-term vertical relationships are supplier agreements where there is no formal agreement but an understanding that satisfaction and responsiveness will lead to a long-term business relationship. But for such "relational contracts" there must be some disincentives to opportunism
- The ability for long-term "relational contracts" to offer the flexibility of market transactions while avoiding many of the transaction costs of spot contracts has resulted in a strong trend away from vertical integration throughout many industries in Western Europe and North America. This has been stimulated in part by observation of the close collaborative relationships that many Japanese companies have with their suppliers. The response of Western companies has been twofold:
  - Companies have redefined their relationships with their suppliers. Rather than rely on competitive tendering and written agreements, manufacturers are increasingly seeking the improved flexibility and closer coordination that can occur through long-term cooperation. Companies have introduced supplier certification programmes and beyond that relationships are based more on trust and mutual interest in continued business than on legally enforceable contracts
  - Companies have focused on a smaller number of vertical activities and increasingly outsourced components and business services

Source: Contemporary strategy analysis, Robert Grant, 1998

Even within a particular industry there is no single "right answer" to the question of how to organise a vertical supply chain. It depends on the firm's competitive strategy and its perception of its core competencies

- The evidence from widely differing companies and industries points to the success of these new vertical relationships in enhancing company performance
- The extent of outsourcing and vertical de-integration has given rise to a new organisational form: the *virtual corporation*, where the primary function of the company is coordinating the activities of a network of suppliers. Although the virtual corporation has advantages of flexibility and the ability to select from a wide range of external capabilities, there is a danger that overreliance on external suppliers of manufacturing and technology causes degeneration into the *hollow corporation*. The risk is that, though incremental moves can be justified on the basis of cost efficiency, in the long run, companies lose the ability to innovate and develop
- In determining whether a firm should undertake a particular activity or rely on an outside supplier, the most common question is whether the firm possesses a competitive advantage in that activity. However, a key aspect of any vertical chain is that the nature of the linkages between activities cannot be appraised individually. Vertical linkages are not just about the costs of managing the transaction; there are also implications for competitive advantage. To what extent is the firm's competitive advantage at each stage of the value chain enhanced by its involvement in adjacent stages?
- Thus vertical integration decisions involve two sets of questions. First, which activities to conduct internally and which to outsource. Second, the choice of vertical arrangements with external suppliers and buyers – whether spot contracts, long-term contracts, or some form of strategic alliance. Both types of decision are critically dependent on the firm's competitive strategy and its perception of its core competences: that is, those capabilities that are fundamental to its competitive advantage over the long term. <u>As a result, we are likely to see very different vertical arrangements among firms within the same industry</u>

Source: Contemporary strategy analysis, Robert Grant, 1998

Implications for the GB rail industry

- Regions which are relatively self-contained and have a dominant train operator suffer from the *"small numbers problem".* With a monopoly supplier and a monopoly buyer there is no equilibrium price – it depends on bargaining. This can lead to unproductive behaviours – i.e. it can increase the *transaction costs* of market contracts. Vertical integration could potentially reduce these
- However, train operations and infrastructure management are fundamentally different types of business and this increases the *administrative costs* of vertical integration
- In other industries, there has been a strong trend away from vertical integration towards more flexible forms of "quasi-vertical integration". Even within a particular industry there is no single "right answer" to the question of how to organise a vertical supply chain. It depends on the firm's competitive strategy and its perception of its core competencies. These may change over time
- The "vertical integration" option for the rail industry should not be thought of solely 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. Supply chain options that fit within the "quasi-vertical integration" framework include (inter alia):
  - In-house delivery of most activities by a single organisation
  - JV between a train operator and an infrastructure management company
  - Many other forms of partnership between the train operator and the IM company – which could include cost and revenue sharing arrangements
- To return to where we started this section, what determines which activities are undertaken within a firm, or between individuals or firms coordinated by market contracts? Relative cost. If the *transaction costs* associated with organising across markets are greater than the *administrative costs* of organising within firms, the coordination of productive activities would most efficiently be carried out within quasi-vertically integrated firms. The relative scale of transaction costs and administrative costs are likely to vary across the network due to the changing circumstances, such as the need for close cooperation to implement major programmes of renewals and enhancements

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Previous academic studies into the impact of alternative rail industry structures have generally (but not always) found that the disbenefits from vertical separation are greater than the benefits - the key benefit being competition between train operators, particularly freight

Summary of existing academic research into the impact of rail industry restructuring

Author (year)	Key conclusions	Overall impact of VI
Pittman (2005)	Research focussed on vertical separation between freight operators and rail infrastructure Strong economies of VI will be lost from separation due to the strong interdependence of freight operators and infrastructure owners at the point of vertical separation, the wheel-rail interface	+
Pittman (2007)	Benefits from alternatives of VI rarely outweigh the losses from vertical separation (i.e. the benefits of VI outweigh the benefits of separation)	+
Cantos Sanchez (2001)	Vertical separation could result in high inefficiencies from the loss of economies of scope and loss of coordination	+
Merket, Smith and Nash (2009)	Vertical separation is not found to have any significant effect on technical or cost efficiency. However, it is found to have a negative effect on the allocative efficiency of production staff and production material. Positive effects of vertical separation in reducing operating costs do not compensate for this	+
Growitsch and Wetzel (2006)	Evidence of efficiency advantages and economies of scope across many integrated European railways	+
Ivaldi and McCullough (2008)	There would be a 20-40% loss of technical efficiency if US railroad freight operations were separated, and an additional 70% loss of operational efficiency if on-rail operations were separated. Authors note that implications for European rail restructuring are not clear, given regional differences	+
Kurosaki (2008)	Optimal VI is dependent upon: the level of motivation of the government to promote within-rail competition; the dominance of passenger vs. freight traffic; and the ability of a rail network to cover its infrastructure costs	+ / -
Cantos, Pastor and Serrano (2010)	Reforms overall were beneficial, in particular for industries where vertical separation was combined with new entrants in the freight sector. This highlights that the success of the reforms is dependent on how successful they are at introducing competition They find that countries that restructure their railways both vertically and horizontally observed the greatest improvements in efficiency levels and productivity indices, and had greater technical progress and productivity growth	-
Lijesen, Mulder and Driessen (2005)	Weak evidence for positive economies of scope in the Dutch rail industry between tracks and railway operation. This suggests that the resulting costs of separation would be limited as there would be insignificant diseconomies of scope	-

Oxera reviewed a similar set of academic papers and concluded that there was no *prima facie* case for VI

Oxera's review of evidence on market structure in European rail (2010)

A1.3 Assessments of market structure in rail markets

[…]

Summary

Due to the variety of data and analytical approaches applied, the picture that emerges from the above review is somewhat confusing. However, we have attempted to draw out common themes, albeit with the caveat that in the dynamic situation (in terms of liberalisation and industry structures) seen in rail markets across Europe over the past 20 years, evidence can often be out of date before it is even published.

- Evidence on economies of scope between infrastructure and operations is weak, suggesting that with well-aligned incentives across this interface, vertical separation should involve limited detriment.
- The introduction of competition is generally beneficial. However, this has generally been more successful in the freight market than in the passenger market, perhaps due to the difficulties of procuring PSO passenger rail services.
- Reforms should be undertaken sequentially, as opposed to in a package, to promote learning by government organisations.

This suggests no *prima facie* case for VI, and the importance of getting franchise specification, procurement and monitoring right for passenger services.

Source: Oxera

Arup's International Review of Service Delivery also highlighted that the choice between vertical integration and vertical separation is not clear cut

Arup's International Review of Service Delivery (2010)

"… It is clear that increasing competition (on track and for the market) in rail is important in improving the competitiveness of the sector and improving the experience for users. However, whether vertical separation is the best way of achieving this is a controversial issue worldwide. It is clearly helpful in ensuring non discrimination whenever there is open access competition or overlapping franchises, and may also increase competition for franchises if some bidders do not want responsibility for the track.

Amongst the arguments against vertical separation are the cost savings arising from joint control of infrastructure and operations. However, studies are inconclusive on this point. Another argument is the transaction costs of negotiating and enforcing contracts between the infrastructure manager and the train operators. A study comparing railways in Germany, Sweden and Britain found these transaction costs represented 1-2% of total costs.

Countries that have undertaken a well planned and sensibly phased package of reforms are on average performing better than those that have resisted reform. Drawing on a set of international case studies, recent research concluded that separation of infrastructure and operations can work well when the capacity of the infrastructure is more than adequate, when the infrastructure manager's maintenance and renewal works do not interfere with services, and when performance regimes incentivise the infrastructure manager to deliver the contracted access rights …"

Nash also evaluated the impact of vertical separation in his paper "Passenger railway reform in the last 20 years – European experience reconsidered"

Nash's Conclusions (2008)

"… But finally what of separation of infrastructure from operations? Those countries which have completely separated them seem by and large to have been most successful in introducing competition, but it is likely that this comes at a cost in terms of transaction costs

These may be avoided by maintaining a vertically integrated company but only as long as that company remains dominant as a train operator, and at the expense of making the achievement of a level playing field for competitors more difficult

It seems doubtful whether a combination of effective regulation, open access, competitive tendering and continuation of a countrywide vertically integrated state-owned holding company offers an effective alternative to complete separation, particularly as the benefits of vertical integration depend on the vertically integrated operator remaining dominant

Maintaining integration by leasing the infrastructure to the main franchisee on each section of the network seems to offer better prospects, but it introduces a new set of interfaces between infrastructure managers in different regions as well as leading to a situation which may favour the passenger operator over freight. It is likely to work best where a set of relatively self-contained passenger franchises can be defined and where freight and open access passenger operations are relatively unimportant

There seems to be no simple solution; rather there are trade-offs which are likely to lead to different outcomes according to the circumstances. Certainly this is an area in need of more research …"

Lou Thompson's paper "Privatising British Railways: Are there lessons for the World Bank and its borrowers" also addresses this issue

Extracts from Thompson's paper on Privatising British Railways (2004)

"… Separation of infrastructure from operations did cause problems of complexity and cost (transaction costs). It did not cause increased accidents and it did support an increase in demand. Whether it yielded benefits in the British context worth the added costs is still debatable. Alternative approaches, such as creation and sale of a limited number of market-defined, integrated franchises might have worked equally well, or better. A mixture of these approaches, with some integral franchises (for example, Scotrail or some of the third rail systems) and some degree of infrastructure separation (for example, the West Coast Main Line), might also have worked …"

"… Bank clients that are not compelled to adopt the E.U. mandates to vertically separate infrastructure from operations should carefully explore the alternatives before adopting the U.K., or E.U. approach. The vertically integrated (infrastructure and operations) freight and passenger concessions in Latin America furnish a very valuable alternative model where traffic is heavily freight or heavily passenger orientated, and where on-rail, intramodal competition is not an important objective. The model in which the dominant user is integrated with infrastructure, but other, sometimes competing, sometimes complimentary, users are permitted access as tenants, also deserves strong consideration where there is a strongly dominant user and an effective regime of independent economic regulation to assure fair access terms for the tenants …"

"… Choosing among these alternatives, either for structure or for ownership, or a mixture of both, is not a simple process for which there are cookbook examples for any country. The key variables for the structural choice appear to be the balance (among freight, intercity passenger and suburban passenger traffic) and density of the use of the network as well as the need for intramodal (as opposed to intermodal) competition as a constraint on operator behaviour, especially where competition can be used to replace regulation …"

Summary of L.E.K.'s key conclusions from the review of existing research into structural changes

1. Vertical integration is neither universally better than, nor universally worse than vertical separation
2. The key benefit of vertical separation is that it facilitates "in the market competition" between train operators
    - These benefits have mainly been realised in the freight sector
    - Competition in the passenger sector is mainly (but not exclusively) "for the market"
3. Vertical separation does lead to some loss of economies of scope, albeit the magnitude of this is uncertain
4. Horizontal separation is a key enabler of improvements in efficiency levels and productivity indices
5. A countrywide vertically integrated state-owned holding company is unlikely to be an effective alternative to complete separation
6. Vertical integration is likely to work best where a relatively self-contained passenger franchise can be defined which accounts for a very high share of train km in the region
7. Reforms should be undertaken sequentially, as opposed to in a package, to facilitate learning by government organisations and other stakeholders

L.E.K. has also carried out its own review of evidence from where vertical integration has been tried elsewhere in rail

British Rail Sector Management and OfQ	• BR went through a number of different organisational structures. The closest it came to the market driven vertical integration model was in the last decade before privatisation when it adopted the Sector Management and Organising for Quality (OfQ) models
Melbourne	• Melbourne's heavy rail network has had a vertically integrated structure, under three rounds of franchising, since privatisation in 1999. Despite some difficulties, and following careful examination, vertical integration has been maintained at each re-franchising stage
Germany	• Germany has adopted a vertical separation approach but the national rail company Deutsche Bahn (DB) operates most of the train services and most of the fixed infrastructure. However, the infrastructure is operated through a subsidiary, DB Netz, which is institutionally separated from the other DB companies
Latin America	• A number of Latin American countries have let vertically integrated concessions for passenger and freight services over the last 15 years
Hong Kong MTR	• Hong Kong MTR is a vertically integrated railway that is quoted on the Hong Kong stock exchange. Government is the majority shareholder but the company is managed as a normal private sector company
Merseytravel	• Merseytravel would like to move to a vertically integrated structure for its self contained rail services. It developed an outline business case in 2006. While this was not taken forward at the time, Merseytravel continues to investigate the benefits of a VI structure
US Class I Railroads	• The Staggers Act of October 1980 significantly relaxed governmental control over the US rail freight market and its private sector, vertically integrated railroads. This has led to significant growth in freight volumes and productivity and sustainable investment

Case Study: British Rail "Organising for Quality" (1 of 2): Description of changes

- Until 1982, British Rail had no "bottom line" below the Chief Executive
- Five Sector Directors were appointed in 1982, as the first stage in moving BR towards a market-driven rather than production-driven approach to management
  - sectors covered InterCity, London and South East (subsequently Network SouthEast), Provincial (subsequently Regional), Freight and Parcels
  - initially, these changes had little impact
- Sub-sector managers were appointed in 1985. These managers ("specifiers") contracted with Regional/Area Managers ("deliverers")
  - this structure led to more effective project specification and a much clearer focus on considering revenue and cost together
  - British Rail delivered significant financial improvements during this period and taxpayer support dropped from 49% in 1982 to 24% in 1988/9, although much of this improvement was GDP driven
- In 1991/92, under "Organising for Quality" (OfQ), sub-sectors were transformed into full vertically integrated business units, with their own resources, but inevitably with substantial inter-business trading
  - this structure was based around seven business units, the five existing sectors plus BR Telecommunications and European Passenger Services
  - each business contained a group of profit centres that combined revenue responsibility, all production functions and marketing. The business units owned all their assets, including infrastructure
  - at a central level, BR confined itself to high-level issues such as the corporate bottom line, long-term strategy, major investment decisions and safety
- The move to OfQ led to significant transitional costs, with staff numbers increasing from 120k in 1990 to 126k in 1992, but then reducing to 109k by 1994

Source: Terry Gourvish, British Rail, 1974-97, From Integration to Privatisation; L.E.K. research

Case Study: British Rail "Organising for Quality" (2 of 2): Conclusions

- Sector Management and OfQ led to considerable improvements in British Rail's financial performance. Infrastructure costs were significantly reduced through two approaches:
  - tailoring specifications to outputs specified by the sectors
  - deferring renewals to achieve short term cash savings

- Many of the managers involved regarded the OfQ organisation as potentially delivering a "golden age" of business led, innovative management. However, the organisation was not given the opportunity to prove itself fully, as the re-election of the Conservative government in 1992 quickly resulted in a change of focus towards privatisation, and further major organisational change

  "… In general terms, sector management represented a positive outcome helping British Rail to modernise its organisational responses and subordinate operating and engineering considerations to the fundamentals of income and expenditure. With all its tensions it was widely regarded inside the industry as a great improvement on previous forms of organisation. Although it is easy to exaggerate the benefits of an ambitious process which was evolutionary and barely in place in full form before it was transformed again, the sector approach undoubtedly contributed to the improvement in rail finances in the 1980s and encouraged a sceptical, even indifferent Conservative government to provide investment for renewal …"

  "… Sector management … did much to release young talent within the railway organisation, talent which might have been stifled by the more bureaucratic structure of regional management …"

  Terry Gourvish, British Rail 1974-97, From Integration to Privatisation

Source: Terry Gourvish, British Rail, 1974-97, From Integration to Privatisation; L.E.K. research

Case Study: Melbourne (1 of 3): Initial privatisation

- The Melbourne train and tram system was privatised in 1999. Government decided to split both the train and tram franchises into two parts to create “competition by comparison”. This also had the advantage of reducing risk to government in the event of an operator defaulting
- Key features of the two train franchises included:
  - Fixed term of 12-15 years. This would enable the state to test the market in the future
  - Vertically integrated with franchisees leasing the infrastructure. Franchisees had significant responsibility for operations, maintenance and renewals, together with improvements to the infrastructure to cater for patronage growth
  - Rolling stock was sold to the private sector and controlled by the franchisees
  - Requirement to provide at least the same level of passenger km but with flexibility to match service levels to demand
  - Commercial pressure to grow revenue was intended to act as the main incentive to improve service quality. However, performance regimes were introduced to incentivise, or penalise, operators for exceeding or failing to meet performance targets
  - Multi-modal ticketing was maintained. Fare increases determined by government alone
- The chosen model transferred significant commercial risk to the operator
- The two metropolitan rail franchises were awarded to Connex Melbourne (Veolia Transportation) and M>Train (National Express) each operating half of the network

Source: Victoria’s public transport, Assessing the results of privatisation, IPA 2007; A Review of Melbourne’s Rail Franchising Reforms, Journeys 2009; Franchising Melbourne’s train and tram system, Auditor General Victoria 2005; International Review of Service Delivery, Arup, 2010; L.E.K. research

Case Study: Melbourne (2 of 3): Franchise outcome

- By mid 2001 the operators were beginning to express concerns about their financial positions, which were being adversely affected by a number of issues
  - Ongoing problems with the automated ticketing systems and process for allocating revenue between operators
  - The application of a new tax in Victoria which led to a 10% real fare increase without an associated revenue gain, which reduced the operators' revenue for about 12 months
  - Failure to deliver on short term demand forecasts
  - Inability to find expected cost efficiencies (bidders may not have recognised the significance of cost efficiencies achieved prior to privatisation or the challenges associated with achieving union support)
- In response to these concerns, government set up a franchise task force to negotiate settlements and interim operating agreements with the franchisees. Some interim payments were paid to all of the franchisees. However, National Express, which was experiencing the most significant financial difficulties, failed to reach a settlement and walked away from its franchise at the end of 2002. Government negotiated with Connex Melbourne to take over the NX franchise
- Government reviewed the use of vertical integration during the negotiations and consciously decided to retain it. The new model emphasised stable partnership relationships with the franchisee and financial sustainability as well as value for money. Some risks were transferred back to government, including the condition of the rail infrastructure
- The contract to run the trains was retendered in 2009 and Metro Trains Melbourne (MTR Corporation JV) was awarded the new vertically integrated franchise. The initial franchise term is eight years, with government having the right to extend the term by up to three years. MTR has the right to negotiate with government for an additional seven years if MTR meets specified performance criteria during the first six years of the franchise
- MTR will be responsible for the maintenance of the infrastructure whilst working in partnership with government in delivering projects and improvements to the public transport network

Source: Victoria's public transport, Assessing the results of privatisation, IPA 2007; A Review of Melbourne's Rail Franchising Reforms, Journeys 2009; Franchising Melbourne's train and tram system, Auditor General Victoria 2005; International Review of Service Delivery, Arup, 2010; L.E.K. research

Case Study: Melbourne (3 of 3): Lessons for GB

- The initial round of Melbourne franchises highlight the importance of ensuring that franchises are financially robust. A number of factors are critical to this, including:
  - Ensuring that the bidders revenue and cost forecasts are robust
  - Ensuring that risk transfer is appropriate. For example, franchisees may not have the financial flexibility to carry out significant unplanned infrastructure renewals or enhancements
- The relationship between the franchisees and government has evolved since the initial franchises were let. It has become much more of a partnership arrangement. One of the key drivers of this is the fact that rapid patronage growth necessitated significant investment in infrastructure enhancements. Many of these investments do not have a positive financial return within the life of the franchise (or indeed ever) so government needed to be involved in deciding the level of funding that it wished to provide to secure enhancements that achieve broader policy objectives
- Arup's report on International Review of Service Delivery notes that "there is some evidence that the vertically integrated nature of the franchises has led to some issues with regard to the effective maintenance of the infrastructure". This may have been due to a combination of relatively short contract periods for the VI franchises combined with the financial distress experienced by the franchisees during the early years
- However, the revised model is generally considered to be a "qualified" success and demonstrates many cost efficiencies
  - a review by the independent Auditor General Victoria in 2005 concluded that the franchises represented "reasonable value for money"
  - independent benchmarking comparing Connex Melbourne to the similarly-sized publicly-operated Sydney CityRail network has concluded that Connex's costs were significantly lower than those of CityRail
- It is also important to note that government made a conscious decision to continue with a vertically integrated model for the most recent franchise term

Source: Victoria's public transport, Assessing the results of privatisation, IPA 2007; A Review of Melbourne's Rail Franchising Reforms, Journeys 2009; Franchising Melbourne's train and tram system, Auditor General Victoria 2005; International Review of Service Delivery, Arup, 2010; L.E.K. research

Case Study: Germany

- The German rail sector is characterised by the existence of a large incumbent company, the state-owned national rail company Deutsche Bahn (DB) and a large number of smaller, regional TOCs
- Germany has followed a vertical separation approach in so far that the tracks of DB (which make up 83% of the total German rail network) are managed by a subsidiary company, DB Netz, which is institutionally separated from the other DB companies
- Since 1994, DB Netz and all other urban and inter-urban rail infrastructure have been opened up to any operator for the payment of usage charges. From 2006 onwards, the German utility regulatory body has been responsible for supervising the rail market, including non-discriminatory access to rail infrastructure
- Germany's railway reforms were aimed at gaining a clear distinction between services which cover their costs and those which do not
  - All long-distance services were deemed commercial services and are operated by DB at its own risk. These services are not eligible for explicit subsidies
  - Regional services are not profitable but are deemed to be in the public interest so are subsidised
- The individual federal states award contracts for regional rail passenger services on a non-exclusive basis. This leaves scope for on-track competition but no commercial operators have made use of these opportunities. The contracts have been awarded using different processes including open tenders, non-open tenders and negotiations
- The share of regional services awarded to non-DB companies has increased from 4% in 1998 to 18% in 2008. However, the overwhelming majority of services have been awarded to DB without competitive procurement
- The most serious problems arise from the vertical integration of the DB group and relate to the fact that competitors of DB need to purchase services such as network access, access to service facilities, workshops and information systems from DB. Several cases of disfavouring non-DB companies by DB Netz, DB Energie and DB Station & Service are documented in reports from the regulator
- Overall the experience with franchising and the regionalisation of rail transport has been very positive. However, most non-DB operators argue that it would work even better if there was a clear split of DB infrastructure management and DB train operations

Source: International Review of Service Delivery, Arup, 2010

Case study: Latin America (1 of 2)

- The Latin American experience of letting rail concessions began in the 1990s, and was viewed by governments as the only alternative to closure of parts of the railway networks. Given the scale of the under-investment in the rail infrastructure and rolling stock, governments focussed on developing concessions for the suburban and metro systems (e.g. Buenos Aires, Mexico City, and Rio de Janeiro)
- The concessions were mainly awarded as net cost, exclusive, vertically integrated concessions with fare levels and level of service specified by the government. They typically covered operations, maintenance and renewals of both infrastructure and rolling stock
- The Latin American railways were typically very labour intensive operations and improving labour productivity was a key objective of privatisation
- The concession periods were initially for 10-25 years, however, these have been extended to 25-30 year periods to encourage concessionaires to finance new rolling stock. However, even with these concession lengths, private operators have been unable or unwilling to invest in the concession requirements for infrastructure and rolling stock renewal and modernisation. This has been exacerbated by governments delaying their commitments to investment
- As long as governments have honoured their commitments to capital investment there have been no real issues. In Rio de Janeiro, however, both the suburban concession and the metro were subject to the delivery on time by government agencies of rolling stock or new lines that were delayed. This created an effective default leading to concession renegotiation

Source: International Review of Service Delivery, Arup, 2010

Case study: Latin America (2 of 2)

- Whilst the Latin American approach to passenger concessions was initially net cost arrangements with considerable freedom, most of the passenger concessions reviewed have evolved toward gross cost arrangements
- This has been attributable to the economic turbulence of the past decade reducing the appetite for private sector commercial risk, together with the related issue of the economic downturns resulting in increased support payments from government for both operations and capital investments
- This in turn has resulted in a closer relationship between government and the concessions. This has made the concessions more open to political influence and the setting of social rather than commercial objectives, which has eroded passenger concessions' commercial freedom to manage their workforces
- It has also resulted in a trend towards more regulation and more government costs as net cost arrangements have slowly become effectively gross cost relationships, with the related transfer of financial risks to the public sector
- Nevertheless, privatisation of the passenger railways has been successful in many areas:
  - Passenger demand has grown strongly on the back of significant capital investment
  - There have been major gains in labour productivity
  - Performance and safety has improved
- With very few exceptions the exclusive, vertically integrated 30 to 50 year freight concessions have also been very successful

Source: International Review of Service Delivery, Arup, 2010

Case Study: Hong Kong MTR

- MTR is the vertically integrated owner and operator of Hong Kong metro. It was incorporated in 1975 and became a listed company in 2000. Government is the majority shareholder but the company is managed as a normal private sector enterprise
- MTR employs 13,000 staff and has a turnover of £1.5bn. It has been successful in developing a portfolio of international businesses including London Overground (2007), Stockholm metro (2009) and Melbourne train network (2009)
- MTR is widely recognised to be one of the top performing metros in the world
  - In the top 3 of almost of CoMET benchmarking categories
  - Asset management excellence award – gold grade (2007)
  - Top 100 most sustainable companies in the world (2009)
- Management consider that vertical integration has been a very successful model for MTR. Over time they have been able to develop a detailed understanding of whole-system, whole-life costs. One of MTR's key strategies has been to extend the useful lives of its key assets in order to optimise life-cycle costs. It has achieved this whilst maintaining excellent levels of reliability
- Management also considers supply chain management to be a key area of strength. It has a policy of using selective outsourcing to obtain benchmark information. This is used to assess the efficiency of their in-house delivery units and to apply some competitive pressure to them
  - For example, one of MTR's major depots is outsourced. The outsourcing contract has detailed requirements for information provision to ensure that MTR has as much visibility of its supplier's costs as it does for its own in-house depots

Source: Asset management for improving business performance – the MTR experience; L.E.K. interviews

Case Study: Merseytravel (1 of 2)

- Since 2003, Merseytravel has had delegated authority to let the concession to operate local rail services on the third rail network on Merseyside. This resulted in Merseytravel specifying, managing and awarding a 25 year concession agreement to Merseyrail Electrics (2002) Limited (Merseyrail) to operate these services until 2028
- Following the success of this arrangement, Merseytravel is looking to take full responsibility for the Merseyrail network, including track, stations, signalling and related assets, as well as control of train services, with the following objectives, to:
  - secure local control of the Merseyrail network assets
  - achieve efficiencies through a focus on the specific requirements of the Merseyrail network and through vertical integration
  - provide a benchmark for the ORR and DfT to use when assessing infrastructure management efficiency
- A transfer of responsibility was first proposed in 2003 and the business case developed over the period to 2006
  - involved 125 year lease of all Mersey infrastructure assets from Network Rail, for a nominal consideration
  - Merseytravel planned to enter into a new concession arrangement for the maintenance and renewal of assets with a separate infrastructure company
  - Merseyrail and the infraco would operate within the same holding company organisation and under common management arrangements, sharing resources as far as possible

Source: Merseytravel

Case Study: Merseytravel (2 of 2)

- An outline business case for full vertical integration was submitted to the DfT in February 2006, [redacted]. Consequently:
  - difficulties were experienced in establishing robust projections of NR's costs in the "business as usual" case
  - considerable uncertainty remained about the actual costs incurred by NR on Merseyside, which were never agreed
- Outline business case forecast cost savings of 6% NPV to 2028
- [redacted]
- The performance efficiency targets subsequently set for Network Rail for CP4 were greater than those assumed in Merseytravel's outline business case. This, coupled with the reduced time period to 2028, would potentially reduce the forecast NPV cost saving. It also raises questions over the appropriate timespan over which any business case should be justified
- Merseytravel continues to look to take its vertical integration proposals forward through further business case development. Subject to demonstration of value for money, its current timeline sees it targeting January 2012 to have a new infrastructure maintainer operating the network

Average annual CP3/4 costs and savings (Outline business case 2006)

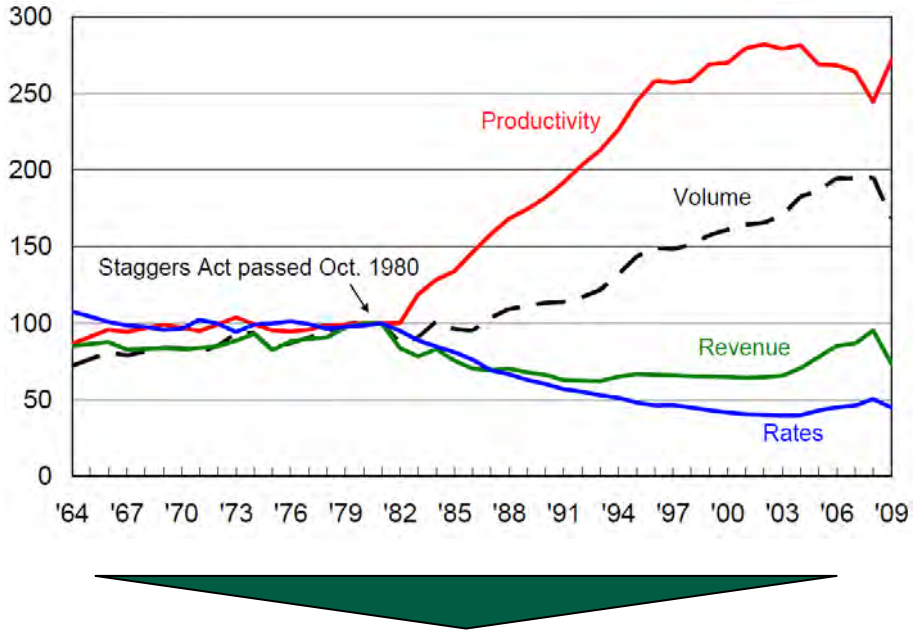
£m	Network Rail	Infraco	Saving (£m)	Saving (%)
Operations	Redacted			
Maintenance				
Renewals				
Overheads				
Total				

Source: Merseytravel

Case Study: US Class I Railroads (1 of 2)

- Longstanding federal economic regulation of railroads, prior to 1980, coupled with increasing competition from other modes led to financial pressure on the industry
- The Staggers Rail Act of 1980 established a more flexible regulatory environment for the rail industry, reducing government control
  - industry operates a vertically integrated model, with the majority of track owned and maintained by railroads
- Regulation is performed by the federal Surface Transportation Board (STB) which retains authority to set maximum rates and take action where a railroad is found to have market dominance or be engaged in anti-competitive behaviour
- The Staggers Rail Act gave railroad managers discretion to use pricing and service levels (often reached through contract negotiations with shippers) to affect the composition of rail output. This has enabled:
  - closures for uneconomic routes and lines
  - significant industry consolidation
  - changes in the mix of freight transported
- These developments led to rapid compounding gains in productivity for an extended period of time

US Freight Railroad Performance 1964-09 (1981 = 100)



Since the Staggers Act, productivity improvements and competition have driven significant freight volume growth, with inflation-adjusted price rates reduced by 55%, improved safety and increased levels of industry investment

Note: 'Volume' is revenue ton-miles; 'Rates' are revenue per ton-mile; 'Productivity' is revenue ton-miles per constant dollar operating expense (excluding special charges)
Source: Association of American Railroads; US Railroad Efficiency: A Brief Economic Overview, McCullough, University of Minnesota

Case Study: US Class I Railroads (2 of 2)

- The railroad industry is now dominated by the 7 largest operators, the Class I Railroads
  - Class I railroads deliver c.70% of freight railroad mileage and over 90% of revenue
  - all are under private ownership, receiving little government funding
- US rail activity is predominantly for freight rather than passenger services, with lower train frequencies on most routes and increased maintenance flexibility than for the UK and other international comparators
- However, the US Class I railroads demonstrate a successful vertically integrated model, including:
  - a profitable business model supporting sustainable levels of infrastructure and rolling stock investment, in conjunction with an improving safety record. There has been significant investment in increased capacity on many trunk routes
  - inter-operation between freight railroads, with freight operators frequently running services over each others' infrastructure under a commercially-negotiated access and charging model
  - inter-operation between freight and passenger services over railroad-owned infrastructure. By law, freight railroads must give Amtrak access to their tracks for passenger services on request, and give priority to Amtrak services over all others. However, passenger journey times are slow and frequencies are generally low (tri-weekly on some routes). Class 1 railroads are resistant to increased passenger speeds, and in some cases seek major infrastructure funding for proposed increases in frequency
- The US freight railways are almost certainly the most efficient and profitable rail operations in the world. But these are long distance, heavy haul freight operations, with very different characteristics from the British network

Source: Association of American Railroads; US Railroad Efficiency: A Brief Economic Overview, McCullough, University of Minnesota

Conclusions from L.E.K.'s review of evidence from where vertical integration has been tried elsewhere

- Vertically integrated railways have historically been the norm
- BR moved to a market driven vertical integration model during the last decade before privatisation when it adopted Sector Management and Organising for Quality (OfQ). These contributed to considerable improvements in British Rail's financial performance. Infrastructure costs were significantly reduced through two approaches
  - tailoring specifications to outputs specified by the sectors
  - deferring renewals to achieve short term cash savings
- Vertical separation has been a relatively recent development, primarily driven by the EU's determination to improve the competitiveness of cross boundary European rail operations, particularly freight
- Franchising on a vertically integrated basis has been adopted in some geographies (e.g. Melbourne, South America) with mixed success
  - These concessions have often involved significant investment and experienced strong patronage growth
  - In both Melbourne and South America the concessions started out with significant risk transfer to the private sector but subsequent financial distress led to some key risks reverting back to the public sector and thereafter much closer involvement by government than was originally planned
- The vertically integrated US freight railways are almost certainly the most efficient rail operations in the world. The single biggest driver of this was the Staggers Rail Act of 1980 which introduced a more flexible regulatory environment for the rail industry, reducing government control. This led to a dramatic restructuring of the industry with significant growth in freight volumes and a sharp decline in passenger services. However, the nature of the US rail market is very different to that of the UK

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Vertical integration option development needs to take into account the DfT's rail franchising policy. However, there are significant areas of uncertainty over the DfT's new policies

- Development of rail franchising policy is outside the scope of L.E.K.'s current remit. However, it is extremely relevant to the development of any vertical integration options as these combine franchised train operations with infrastructure management
- The DfT is in the process of making significant changes to its franchising policy:
  - The previous Government's policy of letting 7-10 year franchises with very prescriptive specifications received widespread criticism for inhibiting private sector investment and innovation
  - The DfT published a consultation document entitled "Reforming Rail Franchising" in July 2010. The consultation closed in October 2010
  - The DfT then published "Reforming Rail Franchising: Government response to consultation and policy statement" on 19 January 2010
- The DfT's latest publication provides a high level statement of the DfT's new franchising policy but significant areas of uncertainty remain. In particular:
  - The DfT proposes to follow a "bespoke approach for each franchise"
  - No ITTs have been issued yet for franchises to be let under the new policy. As such, many of the details of how the policy would work in practice are unclear at this stage
  - The DfT has recognised that franchise reform needs to be coordinated with the recommendations from Sir Roy McNulty's Rail Value for Money study - "further reforms to procurement and contracting of rail services, above and beyond those set out here, may therefore be needed in future"

Source: "Reforming Rail Franchising: Government response to consultation and policy statement", DfT, January 2011

The DfT has announced that 15-22.5 year franchises with less prescriptive specifications will become the norm. There will be significant changes to the risk sharing arrangements and the introduction of a review mechanism will be considered

Key components of the DfT's revised franchising policy

Component	Revised DfT franchising policy	Refs
Franchise length	"… Bidders will therefore be invited to compete for franchises of between 15 and 22.5 years. The exact length of franchises will be determined on a case by case basis by the investment sought …"	2.10
Specification	Government is proposing to give train operators greater flexibility however significant constraints will still exist as a result of government's service specifications – see next slide for further details	5.4-5.9, 6.4
Risk sharing	"… For some franchises, we may expect operators to take full risk. Where we judge risking sharing to be more appropriate, this will be linked to macroeconomic factors (such as GDP and CLE) with the level of support varying according to the franchise. We do not envisage continued use of the Cap and Collar mechanism … We may revise our risk policies further, depending on the final conclusions of the Rail Value for Money Study … we will consider inclusion of a review mechanism on a franchise by franchise basis. This could provide an important mechanism to re-set important elements of longer franchises, such as the risk and revenue assumptions …"	3.9, 3.10
Change mechanism	"… We will consider inclusion of a review mechanism on a franchise by franchise basis … Review points would also allow for the introduction of new industry efficiency reforms, as and then they are devised …" "… An efficient mechanism for 'in-franchise' changes will be especially important in longer contracts, given that change is more likely to be needed over a 15 year period. We intend to retain the detailed Financial Model which has been used in recent franchises, but apply a series of reforms to improve ease of use …" "… We are also considering the introduction of a new independent arbiter role (which could be fulfilled by ORR), to quickly resolve any change disputes between operators and the Department… "	3.14-3.16

Source: "Reforming Rail Franchising: Government response to consultation and policy statement", DfT, January 2011

Government is proposing to give train operators greater flexibility. However significant constraints will still exist as a result of government's service specifications

Revised DfT policy on specification

"… We propose to significantly simplify train service specifications, so that bidders are given greater flexibility in how they develop the service offered to passengers. However, we also recognise that on some routes (and at marginal times of day), train services would not operate unless they were specified, and subsidised. The Government therefore needs to balance operator flexibility with the requirement to protect a core level of service for passengers. Given this, the level and method of train service specification will differ by route and by franchise

In general, we would expect to specify first and last trains, by day of week and specify an off-peak level of service, although the level will vary by route. On a commuter franchise, this level of service specification will be supplemented by a requirement for the operator to satisfy a crowding metric. This metric will ensure that peak services above and beyond the off-peak requirement are operated, and are designed to use the resources sensibly. It will also encourage operators to develop initiatives that encourage passengers to travel in periods of lower demand

For non-commuter services, a peak requirement, framed at a high level, may be necessary. This will be applied on a case by case basis

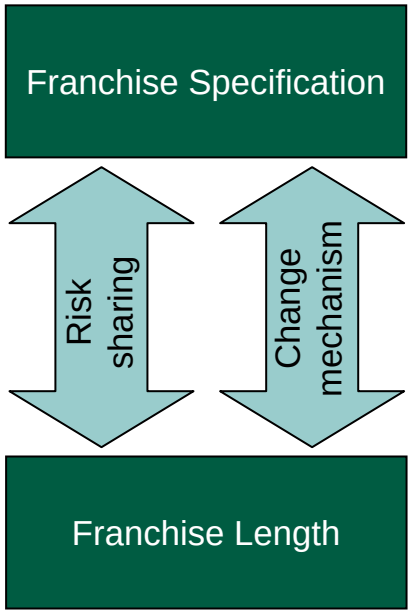
Bidders will be given maximum flexibility to design the most commercial service, whilst protecting the Government's core requirements, and protecting and enhancing the value of the franchise. We will also consider options on select franchises to protect some non-profitable service enhancements. For example, we may require operators to integrate rail with local transport through local transport plans. These plans regularly deliver social, economic and carbon benefits to the local economy, but are unlikely to be directly profitable to operators

Operators will be free to amend timetables during the life of the contract as long as the contracted train service requirements and crowding measure are met. The existing mechanisms to allow operators to amend services will be streamlined

These are general principles, and the exact requirements and bid processes used by DfT will be bespoke for each individual franchise

We propose to introduce a contractually binding requirement on some franchises that will require operators to manage crowding levels as far as possible with the resources available. The relevant resource will be based on the rolling stock committed to through the life of the franchise in an operator's bid … However, because bidders also need to consider overall price to the taxpayer, this measure is not an open-ended requirement to provide capacity to meet demand in all circumstances …"

Ensuring that the risk sharing arrangements and change mechanism are consistent with the franchise length and approach to franchise specification is absolutely essential for the design of any VI concessions (1 of 2)



- The future is uncertain and the more distant future is more uncertain than the more immediate future. As a result, the longer the franchise the greater the uncertainty in many areas:
  - Macroeconomic development, ways of working and leisure behaviours
  - Relative competitiveness of rail and other transport modes
  - Government economic, transport, environmental, social and other policies
  - Supply side developments, including new technologies and input prices
- One of the great strengths of a market economy is its ability to adapt to changes in the external environment. However, the rail industry's ability to adapt has been constrained by a range of structural and contractual features, including prescriptive franchise specifications
- Although the DfT's new approach to franchise specification is intended to be significantly less prescriptive than previously, it will still act as a significant constraint on train operators' ability to adapt to external changes
- There are many examples of rail franchises and concessions which have either terminated early or been renegotiated as a result of either bid assumptions not being deliverable or changes outside the franchisee's control, i.e. things which management cannot address by themselves once the franchise has started. For example:
  - UK: Several of the first round franchises, including Virgin West Coast. Subsequent franchises such as GNER and NXEC
  - Overseas: Melbourne – all first round VI franchises. Most Latin America VI concessions
- Ensuring that the risk sharing arrangements and change mechanism are consistent with the franchise length and approach to franchise specification is absolutely essential for the design of any VI concessions

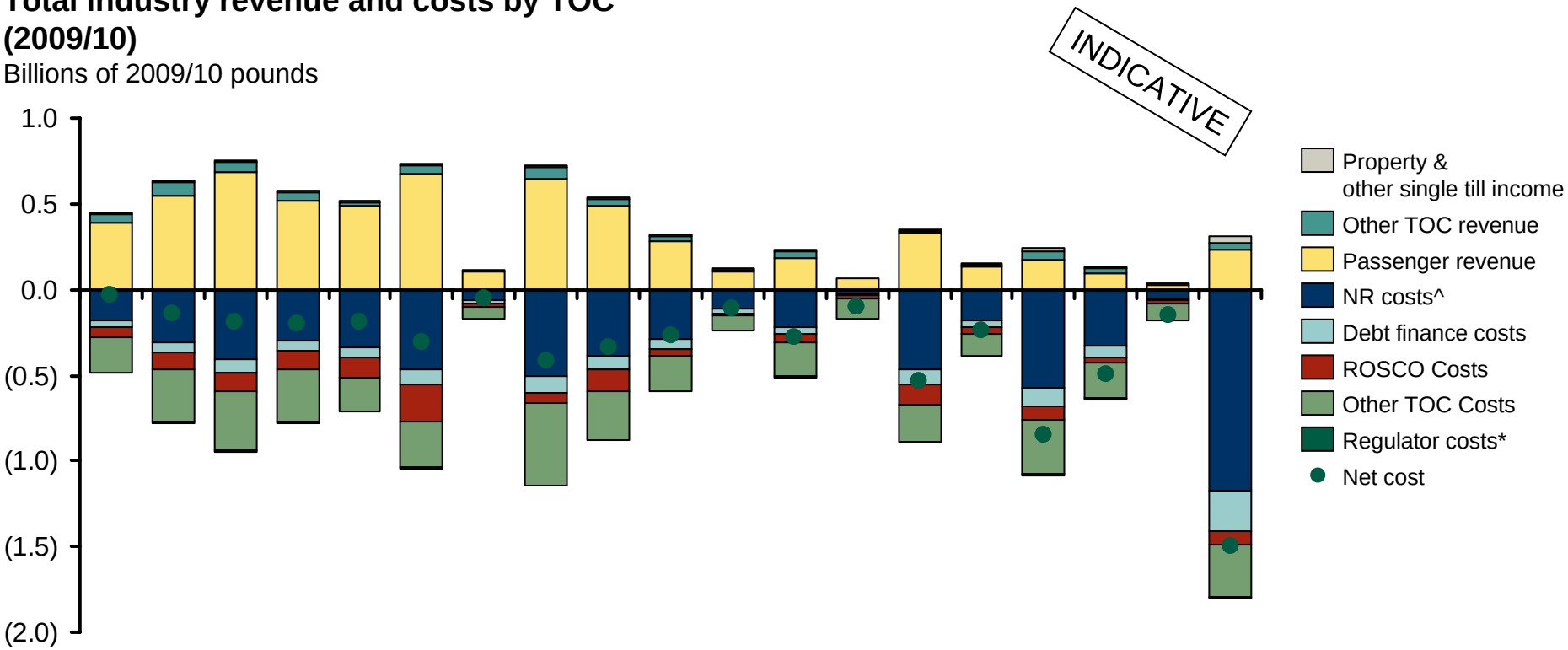
Ensuring that the risk sharing arrangements and change mechanism are consistent with the franchise length and approach to franchise specification is absolutely essential for the design of any VI concessions (2 of 2)

- The purpose of franchise specifications is to secure outputs, in terms of both the quantity and quality of services, that train operators would not otherwise provide in a purely commercial environment
- It is clearly a matter for government and other funders to decide what outputs they wish to procure to achieve broader policy objectives and it is outside L.E.K.'s current remit to provide advice on this subject
- The introduction of the Staggers Rail Act in the US in 1980 demonstrates very clearly the impact of giving train operators significantly more commercial freedom (see case study in last section for further details)
  - Dramatic improvement in productivity
  - Some significant changes in outputs delivers – large increase in freight volumes and large decline in passenger services (however, it should be noted that the US is a very different market to the UK)
- It should also be noted that the gap between the outputs that would be provided by a purely commercial railway and those currently procured by funders varies significantly between UK passenger franchises. This is demonstrated on the next slide which shows income as a percentage of cost for each franchise. This would be 100% in a purely commercial railway because TOC profit has been included in total cost
- As a result, the impact of moving to much less prescriptive specifications would vary significantly between franchises
- The more prescriptive the DfT is in its approach to specification …
  - … the less flexibility train operators have in responding to changes in the external environment and the greater the need for a risk sharing mechanism
  - … the greater the likelihood of the DfT wanting to make mid franchise changes and the greater the need for a change mechanism which can secure VfM in the absence of a competition "for the market"

The gap between the outputs that would be provided by a purely commercial railway and those procured by funders to achieve their broader policy objectives varies significantly between franchises

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

Billions of 2009/10 pounds



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

Please refer to the appendix on financial baseline and option impact quantification for further details of this analysis

Note: * Includes RSSB, RAIB and DfT Rail costs; Excludes freight and Open Access operators. ^ Includes enhancements
Source: DfT; ORR; NR

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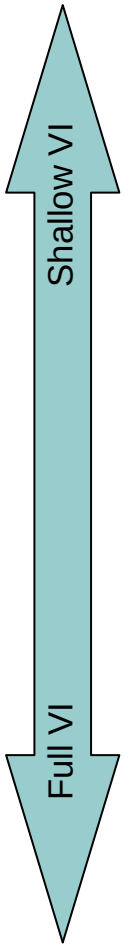
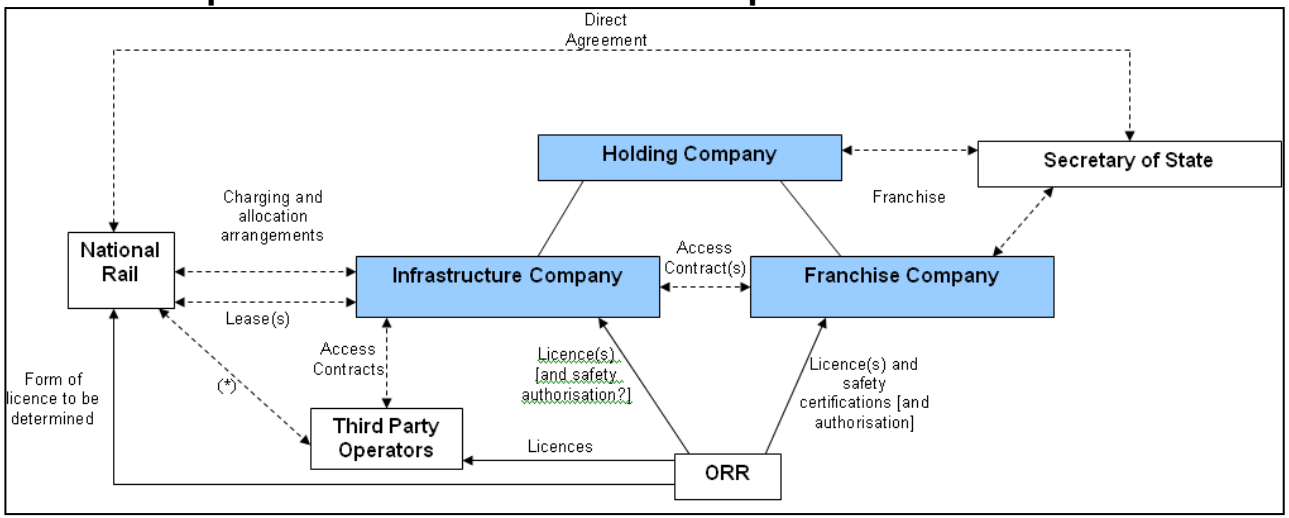
Vertical integration can be thought of in terms of five depth levels. L.E.K. has evaluated two of these options: "Operations VI" and "Full VI"



Level	Incremental responsibilities transferred from Infraco to TOC	Comments	Consider further as VI option?
Level 1	Maintenance, renewal and enhancement of all stations and light maintenance depots	Current arrangements are unnecessarily complicated. There is a cross-industry consensus that the arrangements should be greatly simplified by making a single party responsible for the management of each station The DfT's new franchising policy reflects this so L.E.K. has treated this as part of the baseline rather than a VI option	No
Level 2	Signalling operations, management of control centres and mobile operations managers, performance management	Transfers all operational responsibilities to train operators, i.e. it transfers NR's Route Director responsibilities. This would reduce the complexity of the operational interface and streamline decision making. Arrangement already in place for Tyne & Wear Metro concession	Yes **"Operations VI"**
Level 3	Maintenance of all other fixed infrastructure	Transfers all other "line job", i.e. non-project, work to the train operator. However, this would cause a split in the responsibility for key assets which would make whole-life asset management trade-offs much more difficult. Not considered further because of this	No
Level 4	Renewal and most enhancements of all other fixed infrastructure	Full vertical integration for everything except major enhancements. (i.e. includes all of the incremental items described under options 1 4) Would provide a "line-of-sight" from market demand right through to long term infrastructure decisions	Yes **"Full VI"**
Level 5	Major enhancements	A relatively minor variant on Level 4 (depending on the definition of "major") to cover enhancements that either impact multiple regions or have a very material impact on the business risk of a single region, thereby changing the nature of the business towards more of a construction focus	No

The DfT/ORR have developed a potential structure for the vertical integration option in which responsibility for charging and capacity allocation sits outside the vertically integrated entity

DFT/ORR's potential structure for Full VI option



L.E.K. does not envisage any difference between the horizontal separation and vertical integration options in terms of the roles, responsibilities or ownership of any Central Functions organisations

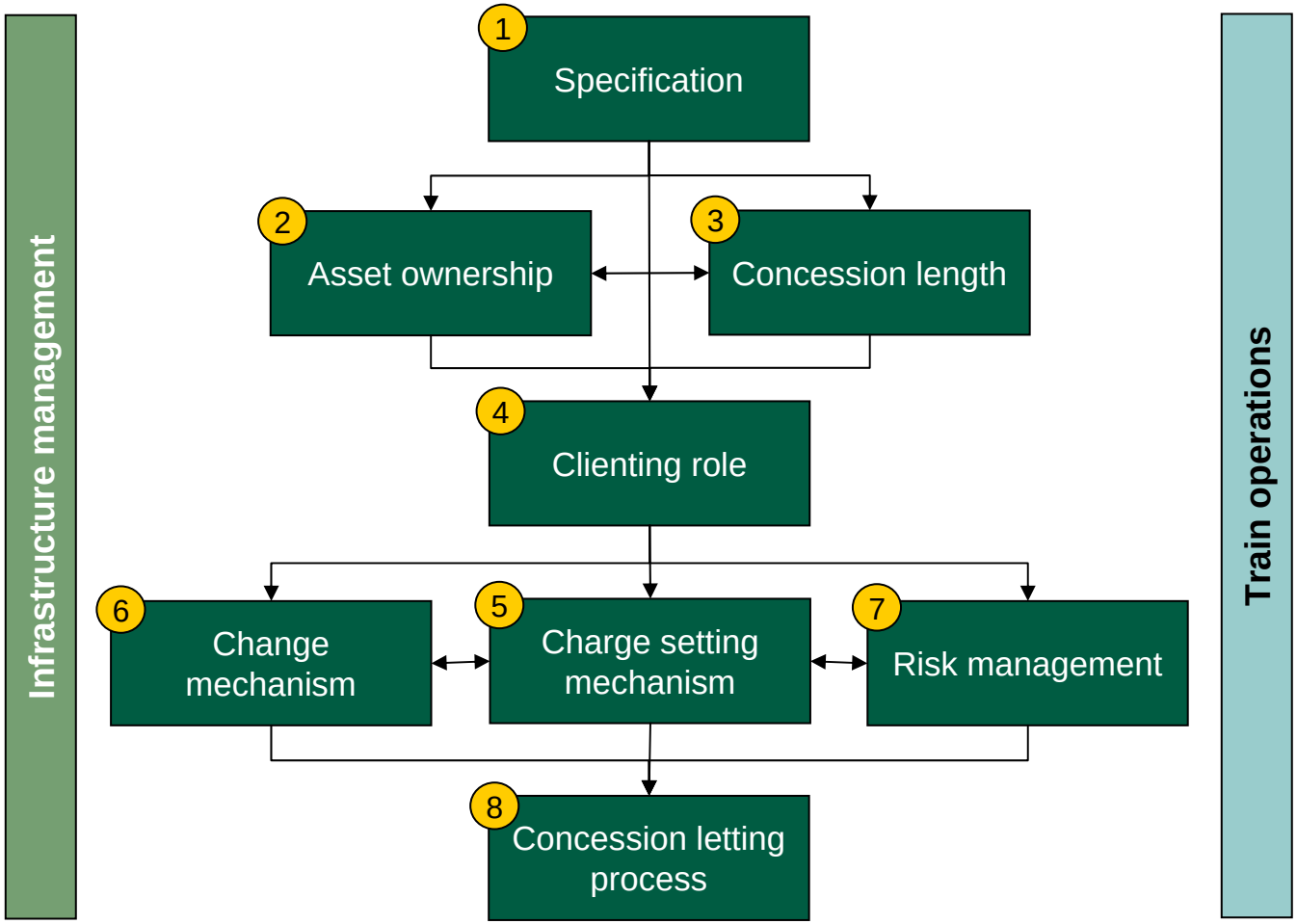
The nature of an Operations VI business would be very similar to that of a current passenger train operations franchise. As such, the regulatory and contractual framework for an Operations VI business should be based on the DfT's new franchising model, with a typical franchise length of 15 – 22.5 years

Note: *The Railways and Other Guided Transport Systems (Safety) Regulations
Source: DfT/ORR

- There are a number of potential legal issues associated with the vertical integration option. These include the requirement for certain infrastructure management "essential functions", such as capacity allocation and charging, to be carried out independently from train operations
- The DfT and ORR have analysed these issues and believe that they can be overcome. For example, they have developed the potential VI structure shown opposite in which charging and capacity allocation take place outside the vertically integrated entity
  - It should be noted that the structure shown opposite is not the only option
- L.E.K. has not obtained any independent legal advice and offers no opinion on the various potential legal structures
- However, L.E.K. agrees that capacity allocation should be independent of the vertically integrated entity in order protect the interests of other train operators

There is a complex interaction between the eight major building blocks of a VI business model, but the approach to specification is a key driver of all other building blocks. Different choices could be made for infrastructure management and train operations for most of the building blocks

Schematic of VI business model building blocks



- The interaction between the building blocks is even more complex than it appears in the diagram opposite because choices made in relation to building blocks shown near the bottom of the diagram could cause a re-assessment of decisions made in relation to building blocks shown higher up in the diagram
  - i.e. there is a feedback loop and a need to iterate

Franchised TOCs currently have a very different business model to NR

Overview of NR and franchised TOC business models

Building block	Network Rail	Franchised TOCs
Specification	Primarily through DfT's five yearly HLOS process which feeds into ORR's periodic reviews	Provided to bidders during franchise letting process and fixed for duration of franchise (subject to agreed changes)
Asset ownership	Owner of all national network fixed infrastructure assets. Large regulatory asset base (RAB)	Very limited asset ownership, although this could increase significantly under DfT's new franchising model
Concession length	Permanent business – as per the standard regulated utility model	Finite duration franchise of 15-22.5 years under DfT's new policy, previously half this length
Clienting role	Primary relationship is with ORR Funders requirements (e.g. HLOS) are procured via ORR	Primary relationship is with the DfT* Relationship with ORR through operating license
Charge setting mechanism	NR annual revenue requirement based on annual O&M costs together with allowed return and amortisation of RAB Regulator sets access charges through five yearly periodic reviews	Annual franchise payments to/from DfT fixed at start of franchise through "competition for the market" – subject to change and risk sharing mechanisms
Change mechanism	Primarily through ORR's periodic reviews, but provisions exist for changes at other times	Schedule 9 of franchise agreement which uses bid financial model to value any changes that the DfT wishes to make to franchise agreement terms
Risk management	Periodic review realigns revenue allowance to expenditure forecasts Allowed return on RAB includes a risk buffer to enable NR to absorb risk between periodic reviews	Old franchising model included revenue share / support mechanism. Some new franchises will instead include a revenue risk sharing mechanism linked to macroeconomic factors (e.g. GDP)
Sales / franchise letting process	Bought Railtrack Plc out of railway administration for £500m	Franchises awarded by DfT via a competitive bidding process. No upfront payment by franchisees

Note: *References to DfT generally also apply to other franchising authorities

The HS1 concession and Melbourne VI rail concessions have slightly different business models to NR and GB TOC franchises

Overview of HS1 concession and Melbourne VI business models

Building block	HS1 concession	Melbourne VI
Specification	Provided to bidders during concession sales process and fixed for duration of concession (subject to agreed changes)	Provided to bidders during franchise letting process and fixed for duration of franchise (subject to agreed changes)
Asset ownership	DfT retains ownership of the fixed infrastructure. HS1 Ltd. leases these from the DfT	Relative limited asset ownership. Fixed infrastructure owned by state
Concession length	30 year concession	Finite duration franchise (8 years initial term, state has right to extend by up to 3 years, franchisee has right to negotiate for an additional 7 years)
Clienting role	Primary relationship is with ORR	State government
Charge setting mechanism	HS1 receives return on upfront investment through “investment recovery charge” (ISC). Fixed access charge rates subject to indexation Regulator sets operations, maintenance and renewals access charges through five yearly periodic reviews	Annual franchise payments to/from state for operations and maintenance fixed at start of franchise through “competition for the market” Payment for projects and enhancements agreed with state during franchise term as specifications developed
Change mechanism	ORR would determine changes to ISC to recover any additional investments	Moderate adjustments to service volume based on agreed rate per service km. Substantial changes based on incremental costs plus margin
Risk management	Periodic review realigns OMR access charges to OMR expenditure forecast. HS1 Ltd at risk for traffic volumes to obtain return on original sales price	Revenue cap and collar, together with rebasing of revenue every c.3 years
Sales / franchise letting process	Concession awarded by DfT via a competitive sale process. HS1 made upfront payment to government for rights to concession (£2.1bn)	Franchises awarded by state government via a competitive bidding process. No upfront payment by franchisees

Note: *Or other franchising authority

1 Building blocks for a VI concession: We have assumed no change to the DfT's HLOS process and its new approach to franchise specification

- The approach to specification has a fundamental impact on all other building blocks of the VI business model and needs to reflect government's overall rail strategy
- In high level terms there are four different types of railway:
  - Option 1: Purely commercial (no cost to Government – at least in the long term)
  - Option 2: Mainly commercial but with targeted regulation and high level specification to protect passengers / wider society and achieve Government's broader policy objectives / transport strategy
  - Option 3: Public service privately delivered – service requirements specified in detail
  - Option 4: Fully public sector
- The previous government's approach to franchising most closely resembled Option 3. The DfT's new franchising proposals suggest some movement towards Option 2
- Options 1 and 2 would facilitate relatively simple VI business models, which could include full privatisation. There would be a much more limited need for a clienting role and fewer mid-concession changes. There would also be less need for a risk sharing mechanism as the VI concessionaire would have greater flexibility to manage risk by making changes to the VI business. Examples of this type of railway include the US Class 1 railroads and German inter-city services (although the latter relates to train operations only rather than VI)
- There is no doubt that government specification and the resulting loss of flexibility are major drivers of cost in the rail industry. We would encourage government to specify the bare minimum that is necessary to achieve its policy objectives and to apply specifications in an output-focussed way that maximises the flexibility available to infrastructure managers and train operators
- However, advising government on overall rail strategy and the approach is outside the scope of L.E.K.'s current remit. As such, we have taken the DfT's current HLOS process and its new approach to franchise specification as givens

2 The key issue for asset ownership is that if ownership remains with NR then the ORR should have responsibility for overseeing sustainability and NR should be restricted to a "sleeping" role in its capacity as asset owner

- The horizontal separation section discussed the pros and cons of any independently owned Regional IMs taking over ownership of the fixed infrastructure assets. The alternative to this being that the assets remaining in NR ownership (or transferring to the DfT) with the Regional IM leasing them for the term of its concession
- The main potential downside of separating asset ownership from the infrastructure management role is the potential for a costly interface to develop if the two parties try to enforce different asset management policies in order to safeguard sustainability
- This risk can be managed by giving responsibility for overseeing sustainability to the ORR and restricting the asset owner to a "sleeping" role (i.e. the asset owner does not play an active role in overseeing sustainability during the term of the concession)
- Providing that the ORR has this role then ownership of the existing fixed infrastructure assets becomes a relatively minor issue from an asset management perspective. The challenge of safeguarding sustainability at the end of a finite length concession would still exist irrespective of whether or not the concessionaire owns the assets. In which case the key considerations regarding asset ownership are:
  - Ease of implementation from a legal and political perspective. Keeping asset ownership with NR is easier from these perspectives
  - Transferring asset ownership could help to establish a RAB, which in turn could be useful for several of the other building blocks including charge setting and risk management. This is discussed in more detail on subsequent slides

3 L.E.K. cannot be prescriptive about the concession length for Full VI businesses at this stage but it is likely to be in the 15-30 year range. If the DfT does move to significantly less prescriptive franchise specifications then it would ideally be at the top end of the range

- VI combines together two different types of business – infrastructure management and train operations. In order for the business to remain vertically integrated the concession length needs to be the same for the two halves of the business. This requires a degree of compromise because if those two components were concessioned separately then their optimal concession lengths would probably be different:
  - In the horizontal separation section we argued that the standard regulated utility model would deliver the highest VfM for any independently owned Regional IMs, i.e. these would be permanent businesses rather than finite duration concessions
  - The DfT's new franchising policy is for franchises to be as long as the EU's Public Service Regulation permits. This allows franchises of up to 15 years, which can be increased by up to 50% (to 22.5 years) if there is significant investment at the same time. This is roughly double the length of franchises let under the DfT's previous policy
- Many railway assets have expected lives of at least 30 years so a long concession length would help to incentivise whole-life decision making. Ensuring long term decision making will always be a challenge towards the end of a finite length concession and the longer the concession the fewer the end points that need managing
- Given the EU regulations there could be some legal issues associated with Full VI concessions of longer than 22.5 years. However, we note that government often lets PFI and other contracts for longer terms than this so there may be legal solutions to this problem. L.E.K. has not sought legal advice on this matter
- Furthermore, as we highlighted earlier, the longer the concession the greater the uncertainty and the greater the likelihood of significant changes to the specification. As such, the longer the concession the more challenging it becomes to achieve VfM for risk transfer and mid franchise changes. The extent to which this would be an issue depends on the DfT's approach to specification and there is currently significant uncertainty as to how prescriptive the DfT's new approach will be in practice
- As such, L.E.K. cannot be prescriptive about the concession length for Full VI businesses at this stage but it is likely to be in the 15-30 year range. If the DfT does move to significantly less prescriptive franchise specifications, and EU law allows it, then the concession duration would ideally be at the top end of the range
  - Moving to an evergreen model could be considered in the longer term once the effectiveness of the periodic review process has been demonstrated

4 L.E.K. is not recommending any changes to the clienting role for the IM part of a VI entity. However, some clienting responsibilities for the train operations part of the business could transfer from the DfT to the ORR

- The "clienting role" covers a number of different oversight related roles, including:
  - Development of the specification
  - Development of the contractual and regulatory frameworks
  - Managing any sales or franchising letting processes
  - Setting of charges during the franchise / concession term where necessary, including in relation to changes in specification or other terms and conditions
  - Paying for any non-commercial outputs which have been specified to achieve broader policy objectives
  - Overseeing compliance with the specification and all other contractual and regulatory requirements
  - Monitoring financial robustness of businesses and dealing with any financial distress situations
- Clienting roles are currently split between the DfT and ORR for both train operators and Network Rail. However, the primary relationships are different: DfT (or other funders) has the primary relationship with train operators; ORR has the primary relationship with Network Rail
- In order to achieve the full benefits of comparative regulation it is important for the ORR to retain the primary relationship with the infrastructure management component of any VI entity and to regulate this in a similar way to NR and any independently owned Regional IMs
- The key remaining issue is whether some of the DfT's train operations franchising responsibilities should transfer to the ORR. We understand from the DfT/ORR that there could be some legal restrictions on this
- The DfT/ORR's potential structure for the Full VI option shown earlier keeps the current primary relationships the same, but they would apply to different legal entities owned by the same holding company
- Given that the DfT's new approach to rail franchising still involves it setting relatively detailed franchise specifications it would be difficult for the DfT to transfer all of its clienting responsibilities to the ORR for vertically integrated entities. However, it may well be able to transfer some of its clienting responsibilities. Further legal advice would be required in order to develop more detailed proposals in this area

5 6 7 L.E.K. recommends continuing with an ORR led periodic review process for the IM component of a VI concession. It may be appropriate to apply a similar process to the train operations component of a VI concession as well – at least for the later years (1 of 3)

- Building blocks 5, 6 and 7 are charge setting mechanism, change mechanism and risk management. These are all very closely linked so we have chosen to discuss them together
- As highlighted earlier, NR and franchised TOCs operate under very different regimes in these areas:
  - The ORR's five yearly periodic review process is at the heart of these building blocks for NR. In addition, NR receives a risk buffer as part of its allowed return on its RAB. This helps it to manage risk between periodic reviews
  - The franchise bidding process is at the heart of these building blocks for franchised TOCs. The franchise payments are set at the time of bidding and the bid financial model is used to help value the impact on franchise payments of any changes. A formulaic revenue risk sharing mechanism is used to keep revenue risk at a manageable level given the limited flexibility that TOCs have due to franchise specification
  - In summary, the NR regime is based on regulation, whereas the franchised TOC regime is based on "competition for the market"
- The longer the concession term, the greater the uncertainty in many areas including macroeconomic development, relative competitiveness of rail and other transport modes, government policy and supply side developments. As such, the longer the concession term …
  - … the greater the likelihood that the DfT will want to make significant changes to the specification – relating to both fixed infrastructure and train operations. Therefore, the greater the need for an effective change mechanism
  - … the greater the need for an effective risk sharing mechanism if specifications restrict the concesssionaire's flexibility (as appears likely to be the case)

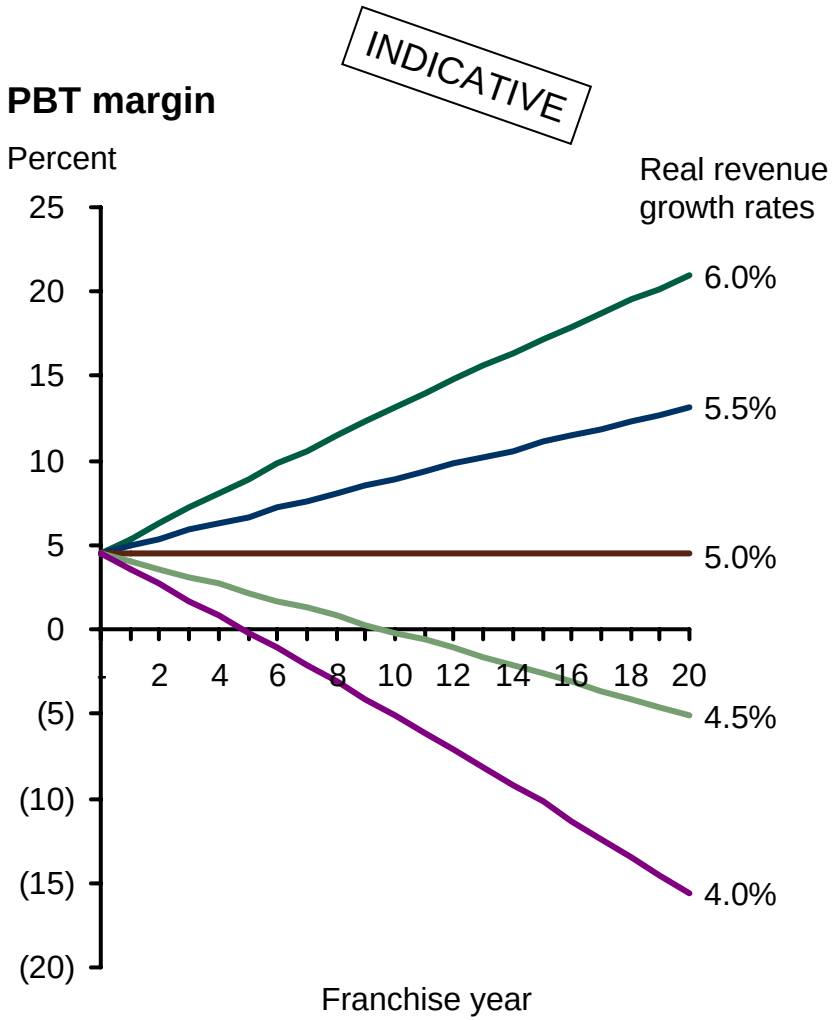
5
6
7

L.E.K. recommends continuing with an ORR led periodic review process for the IM component of a VI concession. It may be appropriate to apply a similar process to the train operations component of a VI concession as well – at least for the later years (2 of 3)

- The HS1 concession includes five yearly periodic reviews to reset the operations, maintenance and renewals component of access charges. The HS1 assets are relatively new and knowledge of asset condition is relatively good
- Asset condition risk is much greater for the rest of the network. As such, we would strongly recommend continuing with the ORR's standard approach of determining efficient infrastructure management expenditure through regular periodic reviews. Trying to fix the revenue requirement for these activities for the whole term of a concession via an initial competition for the market would lead to an inappropriately high risk transfer to the private sector, and a correspondingly high risk of either super profits or financial distress
- There have been significant problems with the operation of the DfT's franchise change mechanism and revenue risk sharing mechanism in practice. We acknowledge that the DfT is looking to improve both mechanisms as part of its review of franchising policy, however, some issues are likely to remain. For example, how will the new revenue sharing mechanism cope with uncertainties in GDP elasticities? The potential gap between actual revenue and "as bid" revenue after 15 years is potentially very large, even if the DfT implements a macroeconomic factors base revenue risk sharing mechanism
- 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 as well. Exactly how this would work requires significantly more development work than is possible within L.E.K.'s current remit. In particular:
  - When would the first periodic review take place? After 5, 10 or 15 years?
  - What would be the equivalent of NR's allowed return for the train operations component?
- The experiences with VI concessions in Latin America and Melbourne, together with many GB train operations franchises highlight the need to keep risk transfer at a manageable level

L.E.K. recommends continuing with an ORR led periodic review process for the IM component of a VI concession. It may be appropriate to apply a similar process to the train operations component of a VI concession as well – at least for the later years (3 of 3)

INDICATIVE



Example of difficulty of making long term revenue forecasts

- Continuation of the post-privatisation average annual rail patronage growth rate of 4% would imply an overall increase in rail demand of 119% over a 20 year period or 224% over a 30 year period. Accommodating this level of additional demand could require major infrastructure works which would be difficult to scope many years in advance
- The constraints imposed by specifications could also make it very difficult to manage the financial risk associated with long concessions. The chart opposite shows a TOC's profit margin over time for different outturn revenue growth rates, assuming that the TOC is not able to adjust its cost base accordingly. It assumes an "as bid" margin of 4.5% of revenue every year and real "as bid" revenue growth of 5.0% p.a.
  - Even if a risk share mechanism protected a TOC from GDP / employment growth risk, the long term outturn revenue growth rate could easily be 0.5% p.a. different to the "as bid" forecast

8 The complexity of the concession letting process should not be underestimated. The evaluation process would be far more complicated than the DfT's franchise bid evaluations hitherto

- Any VI concessions should be awarded through a competitive bidding process. The process could resemble some combination of the DfT's new franchise letting process and the HS1 sales process. The process would be led by the DfT or other funders
- The complexity of the process should not be underestimated. It would require a lengthy period of planning to ensure that all aspects of the business model and supporting contractual and regulatory frameworks are robust
- Furthermore, the evaluation process would be far more complicated than the DfT's franchise bid evaluations hitherto. A broad range of factors would need to be taken into account including the impact of any regulatory reviews on "as bid" numbers, plans to improve the condition or capability of the infrastructure and the knock on benefits from comparative regulation. The details of the concession letting and bid evaluation process are outside the scope of L.E.K.'s current remit
- For the reasons given in the horizontal separation section we would recommend including part of NR's RAB in the VI entity

Summary of Full VI option business model

Building block	Comments
Specification	The approach to specification has a fundamental impact on all other building blocks of the VI business model. We have assumed no change to the DfT's HLOS process and its new approach to franchise specification
Asset ownership	The key issue for asset ownership is that if ownership remains with NR then the ORR should have responsibility for overseeing sustainability and NR should be restricted to a "sleeping" role in its capacity as asset owner
Concession length	L.E.K. cannot be prescriptive about the concession length for Full VI businesses at this stage but it is likely to be in the 15-30 year range. If the DfT does move to significantly less prescriptive franchise specifications then it would ideally be at the top end of the range
Clienting role	L.E.K. is not recommending any changes to the clienting role for the IM part of a VI entity. In order to achieve the full benefits of comparative regulation it is important for the ORR to retain the primary relationship with the IM component of any VI entity. Some responsibilities could potentially be transferred from DfT to ORR for the train operations part of the VI entity
Charge setting mechanism	L.E.K. recommends continuing with an ORR led periodic review process for the IM component of a VI concession 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 as well
Change mechanism	
Risk management	
Concession letting process	Any VI concessions should be awarded through a competitive bidding process. The process could resemble some combination of the DfT's new franchise letting process and the HS1 sales process The complexity of the process should not be underestimated. The evaluation process would need to take into account a far broader range of factors than the DfT's franchise bid evaluations hitherto

Note: *References to DfT generally also apply to other franchising authorities

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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

- L.E.K.'s review of existing academic research highlighted that VI is likely to work best in regions which are relatively self contained and where there is a single dominant operator

  "… It is likely to work best where a set of relatively self-contained passenger franchises can be defined and where freight and open access passenger operations are relatively unimportant …"
  Passenger railway reform in the last 20 years – European experience reconsidered, Nash, 2008

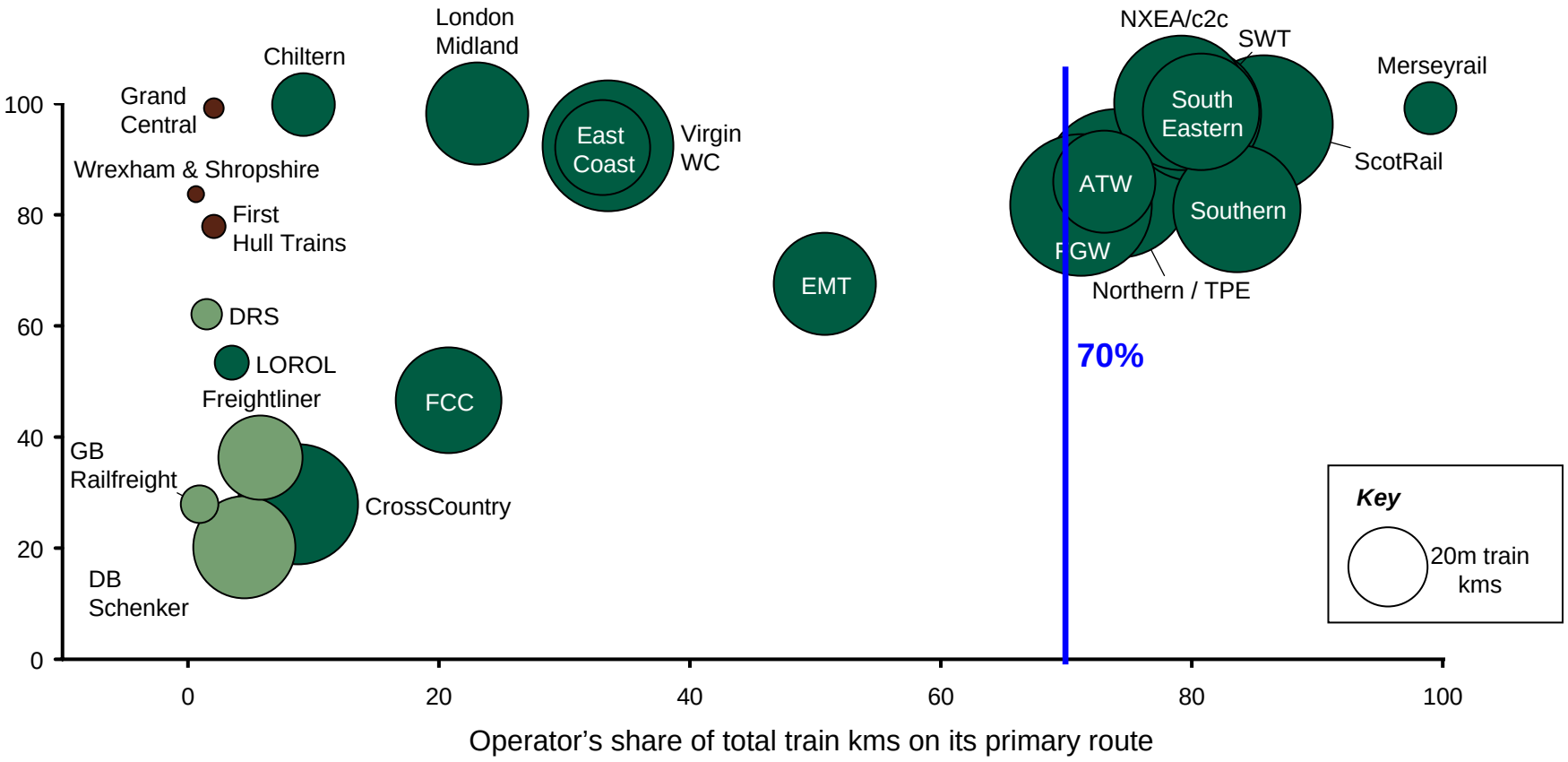
  "… The model in which the dominant user is integrated with infrastructure, but other, sometimes competing, sometimes complimentary, users are permitted access as tenants, also deserves strong consideration where there is a strongly dominant user and an effective regime of independent economic regulation to assure fair access terms for the tenants …"
  Privatising British Railways: Are there lessons for the World Bank and its borrowers, Lou Thompson, 2004

- 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 (inc. c2c) presents the earliest opportunity for implementing VI. We would not recommend VI in Kent or Sussex until the Thameslink project has been completed (2018)

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 NR's Operating Routes but after splitting out Wales, the East and West Coast Main Lines and Merseyside
Source: NR; L.E.K. analysis

A number of other franchises would have reasonably good alignment with infrastructure regions if separate Northern, Wales and Merseyside IMs are created. However, it would be more difficult to implement VI in a number of these regions than for the franchises discussed on the last slide

Relative attractiveness of franchises for vertical integration

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	
Northern Rail	Mar 13	Northern (LNE)	84	57	High	Medium	Does not fit with present route structure; VI might be possible if a separate Northern region is created - this is desirable to improve alignment for the Base/VA options in any case Alignment improved if combined with TPE
TPE	Feb 12	Northern (LNE/LNW)	70	17	High	Medium	Does not fit with present route structure; VI might be possible if a separate Northern region is created - this is desirable to improve alignment for the Base/VA options in any case Alignment improved if combined with Northern Rail
Northern / TPE combined	n/a	Northern (LNE/LNW)	81	74	High	Medium	Combined TOCs are well aligned with proposed Northern region
Arriva Trains Wales	Aug 18	Wales	86	73	Medium	Medium	Well aligned if Wales region split out from Western
FGW	Mar 13 or Mar 16	West of England	82	71	Medium	Medium	Major projects planned or in hand e.g., Reading reconstruction, electrification Impact of possible Welsh region. Well aligned with West of England region
Merseyrail	Jul 28	Merseyside	99	99	Minimal	Minimal	Likely to be taken forward as a pilot with Merseytravel Small scale - potential diseconomies of scale

Note: Regions are NR's Operating Routes but after splitting out Wales, the East and West Coast Main Lines and Merseyside
Source: NR; L.E.K. analysis

Using a refined version of NR's operating routes as the geographies for vertically integrated entities has a number of advantages so these geographies should be prioritised

- Using (a refined version of) NR's operating routes as the geographies for vertically integrated entities has a number of advantages so these geographies should be prioritised:
  - A number of TOCs are already quite well aligned to these operating routes
  - NR's current devolution process is based on its operating routes. This includes implementing changes to its accounting systems in order to produce reliable accounts for these routes
  - The operating routes are large enough for the Regional IM component of the vertically integrated entities to provide useful information for comparative regulation purposes
- A number of PTEs have expressed an interest in vertical integration for part of NR's network within their area of responsibility. Merseytravel has the most advanced plans for this and was discussed in an earlier case study. The proposed geographic extent of the VI entities in PTE areas is typically much smaller than NR's operating routes. As such, these geographies might not be large enough to achieve all of the economies of scale and they would not be as useful for comparative regulation purposes as the larger NR operating routes
- Some parts of the network (e.g. the east and west coast main lines) are unlikely ever to be suitable for VI as they are unlikely ever to be sufficiently self contained with a single dominant operator
- Furthermore, some train operators such as Cross Country and freight operators are network-wide and so would not be suitable for vertical integration in their current form

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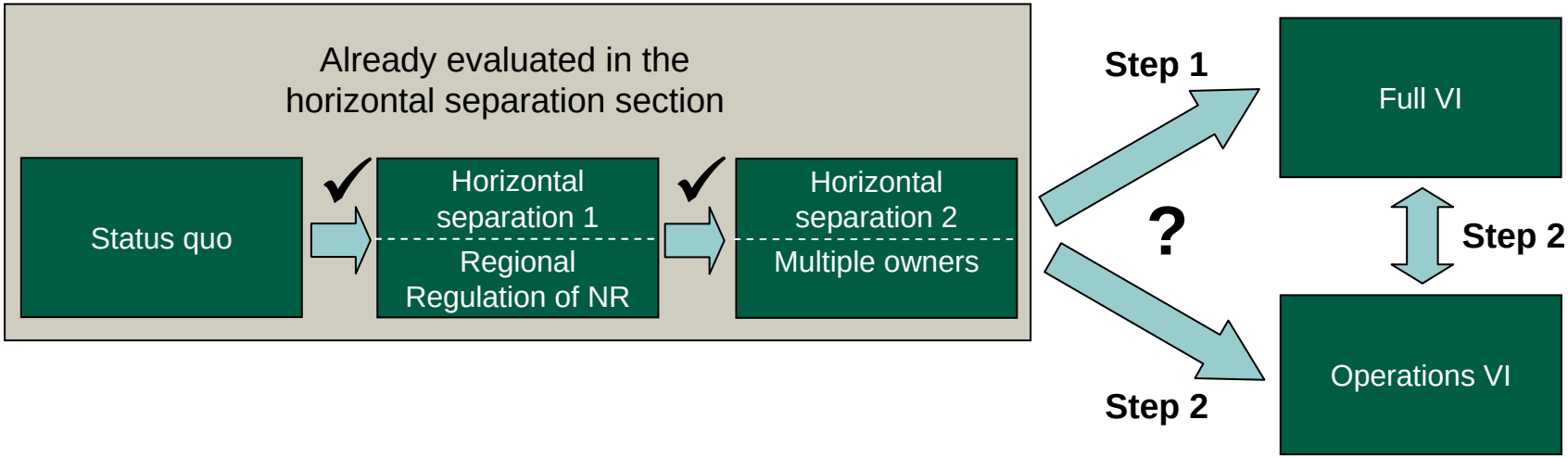
L.E.K. has used the Anglia region as an example geography for evaluating the impact of VI. As discussed in the last section, Anglia is a candidate for early implementation of VI

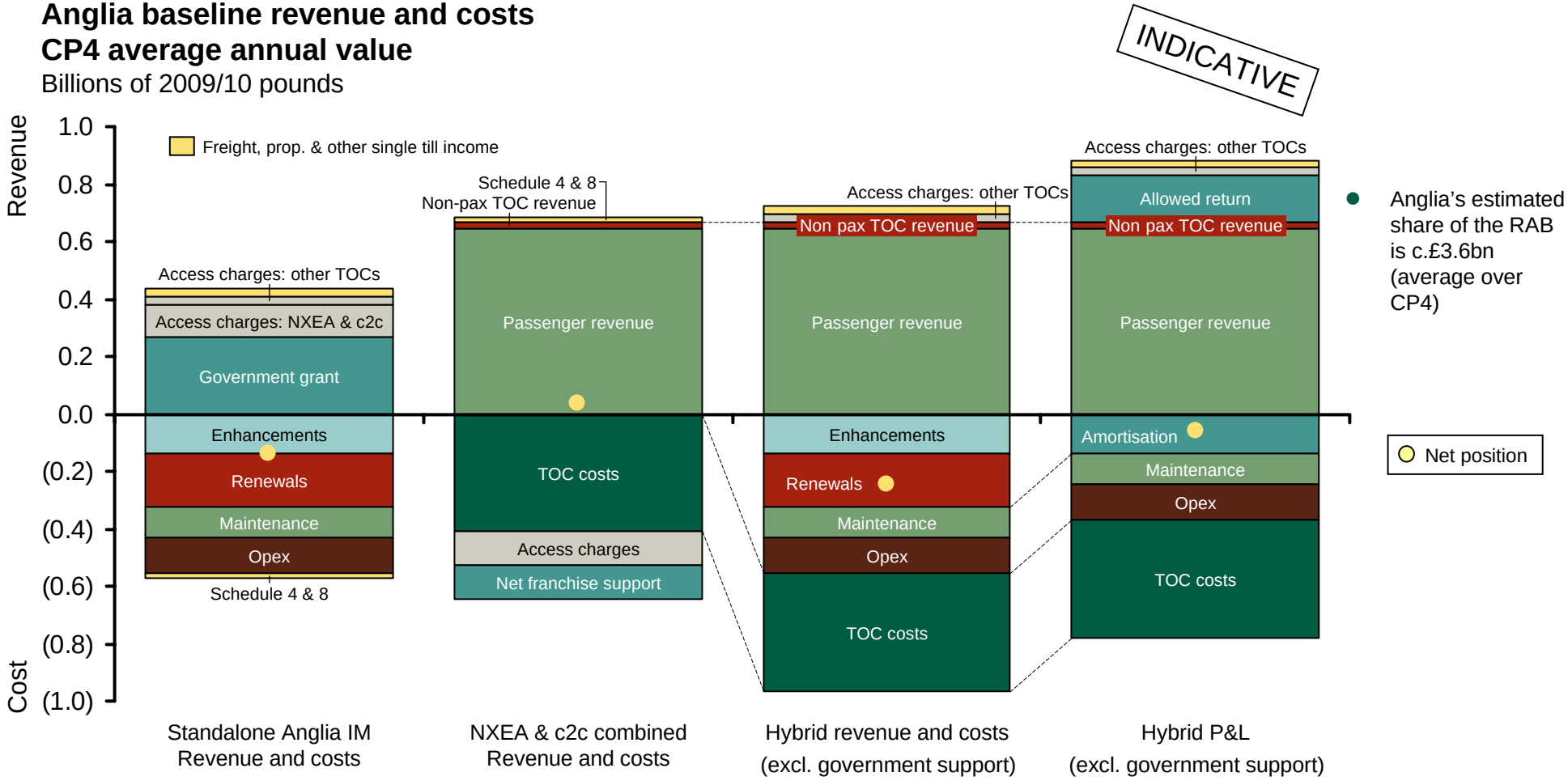
Road map for evaluating vertical integration



- **Step 1**: Evaluate the cost and benefits of implementing Full VI in Anglia instead of having an independently owned Regional IM which is separate from all train operators
- **Step 2**: Evaluate the cost and benefits of implementing Operations VI in Anglia instead of having an independently owned Regional IM which is separate from all train operators. Compare the outcomes from Steps 1 and 2

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

Anglia baseline revenue and costs
CP4 average annual value
Billions of 2009/10 pounds



Further details on the Anglia region have been provided in the case study in the appendix to this presentation

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

Full VI has a number of potential advantages and disadvantages relative to HS with multiple owners

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

Advantages

1. Reduced interface management costs during the term of the concession
2. Giving overall operational control to the organisation responsible for running the trains should help to minimise disruption to trains and improve passenger information
3. 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

4. Greater transition cost and risk
   - Many TOCs do not currently have the skills or knowledge
5. Mixes together two fundamentally different types of business. Could result in TOC owning groups reducing their focus on their train operations business
6. 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"
7. Reduced intensity of initial bidding if some TOC owning groups do not want to bid for a VI concession
8. - 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

1 Reduced interface management costs during the term of the concession (1 of 2): Introduction

- There is a relatively complex operational and contractual interface between NR and TOCs. This includes:
  - Overall management of customer-supplier relationship and track access agreement
  - On-the-day operations and controls
  - Performance management, including administration of Schedule 8
  - Possessions planning, including administration of Schedule 4 and Network Change
  - Capacity allocation and timetable development
  - Stations and depots management
  - Rolling stock route clearance
  - Long term planning and development of enhancement schemes
- Full VI could reduce the cost of several of these interfaces by internalising them within a VI entity. However, a number of points should be noted:
  - Even if the VI entity has a single overall owner group, several managerial interfaces would still exist within the VI entity. Whilst the alignment of economic incentives should help to make these interfaces easier to manage, large complex organisations are often not as joined-up and co-ordinated as they should be
  - The VI entity may actually be a JV structure with a series of underlying sub-contracts with individual JV partner companies or third parties. As such, contractual interfaces may still exist within the VI entity and incentives may not be fully aligned across these
  - Several interfaces would remain between the VI entity and the organisation(s) accountable for central functions (e.g. timetabling, possessions planning)
  - Interfaces would remain between the VI entity and secondary operators
  - Some interfaces should already have been addressed in the baseline (e.g. the current stations management interface costs are assumed to be addressed through the DfT's new approach to franchising)

1 Reduced interface management costs during the term of the concession (2 of 2): Academic research indicates that VI could reduce transaction costs in the Anglia region by c.£10m p.a.. However, bottom-up analysis suggests a figure closer to £2m p.a.

- Academic research into the impact of rail industry restructuring confirms that vertical separation leads to an increase in transaction costs

  "… Separation of infrastructure from operations did cause problems of complexity and cost (transaction costs) …"
  Privatising British Railways, Are there lessons for the World Bank and its borrowers?, Lou Thompson, 2004

  "… It is likely that this comes at a cost in terms of transaction costs. These may be avoided by maintaining a vertically integrated company but only as long as that company remains dominant as a train operator …"
  Passenger railway reform in the last 20 years – European experience reconsidered, Chris Nash, 2008

- Further confirmation of this was provided by Merkert et al in 2008. In a comparison of Germany, Sweden and Britain, Merkert found that transaction costs are higher in vertically separated forms by c.1-2% of total costs. This is equivalent to £10-20m p.a. for the Anglia region

- However, several interfaces would still be required if vertical integration were introduced in a number of regions in the UK. For example, between the VI entity and other train operators in that region, between the VI entity and other Regional IMs, and with the Central Functions organisations. As such, L.E.K. has taken the lower bound of Merkert's estimate to be the upper bound of its own range (i.e. £10m for Anglia)

- Given the time and budget available for this project, L.E.K. has not developed a detailed bottom-up estimate of the savings from reduced interface management costs. However, based on L.E.K.'s high level review of the train operator and NR organisation charts, together with discussions with NXEA's management team, L.E.K. has developed an indicative bottom-up estimate of £2m p.a. as the low end of the potential range of savings for the Anglia region

- This results in an overall range of £2-10m p.a. of savings from reduced interface management costs in the Anglia region

2 Giving overall operational control to the organisation responsible for running the trains should help to minimise disruption to trains and improve passenger information

Of the thirty different passenger satisfaction categories included in the Spring 2010 NPS wave, *"how well train company deals with delays"* received the lowest rating, with just 35% of respondents giving this a rating of "satisfied" or "good"

- NR currently has overall operational control of the railway. Each TOC has its own set of controllers who interface with NR's signallers and controllers in order to deal with any perturbations to the timetable from a train operations perspective
- TOCs and NR recognise the importance of working together very closely in this area and several have already been established co-located or joint control rooms
- Those organisations who have progressed furthest with joint working report that they have achieved significant benefits in terms if performance improvement. South West Trains is a shining example of this
  - In some situations NR and TOCs have also been able to reduce their combined headcount through reducing of removing "man marking" – the cost savings associated with this are included in the reduced interface management costs discussed on the last slide
- Giving overall operational control to the organisation responsible for running the trains should also help to improve passenger information at times of disruption. Both Operations VI and Full VI would achieve this
- It is very difficult to estimate the financial impact of this as it depends on a whole range of local factors. For example, the potential benefits would be much greater in percentage terms on Greater Anglia than Essex Thameside because the latter already has an excellent track record of operational performance. However, to give an indication of the potential scale of benefits, a 1 percentage point increase in PPM would be equivalent to an estimated 1% increase in revenue. Applying this to Anglia's revenue base would give a revenue uplift of £6m p.a.

3 Aligns incentives and facilitates market driven whole-system optimisation for a particular region (1 of 7): Introduction

> "… 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 …"
>
> Executive summary, RVfM Interim Submission to Secretary of State, September 2010

- Full VI is the structure that achieves the best alignment of incentives between infrastructure managers and train operators. However, two points need to be noted:
  - It does not necessarily fully align incentives within the VI entity, e.g. if the VI entity subcontracts some work to individual JV partner companies
  - It does not automatically align incentives with secondary train operators
- To the extent that incentives are aligned, Full VI 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)
  - Enables a demand led approach to asset management decision making rather than a production led approach
  - Facilitates trade-offs between performance, service frequencies and journey times
  - Facilitates evaluation of the full range of options for overcoming bottlenecks and helps to ensure that enhancements specifications are focussed on achieving train operators requirements
- Helps to resolve the "small numbers problem" described in the earlier section on management theory, i.e. with a monopoly supplier and a monopoly buyer there is no equilibrium price – it depends on bargaining. This can lead to unproductive behaviours – i.e. it can increase the transaction costs of market contracts

3 Aligns incentives (2 of 7): Atkins identified £0.5-1.2bn of potential saving from improving asset management. However, Atkins' view is that NR's Transformation project will already capture £0.4bn of this

Category	Enabler	Description	Potential saving (£m)	NR Transform-ation project (£m)	Increment (£m)
Improved asset knowledge for prediction and management	Rationalised systems	A reduction in the number of software packages and licences (and more standardisation of tools)	10 – 16 (15-25%)	0	10 - 16
Locally optimised maintenance and renewals within a national framework	Consistent direction	Consistent direction of objectives (all pulling together with commonality of purpose) but achieved by local accountability (ties-in local asset knowledge but imposes national priorities)	460 - 1,140 (12-30%)	410	50 - 730
	Preventive vs. corrective	Improved ratio of preventive to corrective maintenance			
	Maintenance mix	A shift to an appropriate maintenance mix (run to fail, risk based, condition based, reliability based and time based maintenance regimes appropriate to the assets and usage) reflecting improved asset knowledge, e.g., a good understanding of deterioration			

Note: Atkins' asset management cost savings are shown before adjustment for overlap with its separately-identified supply chain cost savings
Source: Rail Value for Money Study, 2010, Atkins

3 Aligns incentives (3 of 7): L.E.K. commissioned Dr. Christian Roberts of GHD to review Atkins' report and to comment on the asset management implications for alternative railway structures

Summary of GHD's views on asset management implications for alternative railway structure

"… Our review of this [Atkins'] report suggests that there is little structural consequences to achieving either of the two Whole System Asset Management benefits [identified by Atkins] – both being achievable with Good Management Leadership …

… However several other cost savings and benefits would be dependent on the Railway Structure … GHD's review suggests that either a radical horizontal separation or some form of vertical alignment / integration would better enable Good Practice Asset Management to be introduced … However, enabling whole-of-system optimisation would require well-run Vertical Alignment or Vertical Integration to remove cross business / asset barriers or constraints …

… 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. We therefore believe that having clear remit to deliver all aspects of the rail service will better serve the customer in the long run, as opposed to delivering just the infrastructure or rolling stock component …

… In all instances delivering the necessary organisation and culture change would be more practical and achievable on a smaller regional scale – this would also reduce the Line of Sight, enabling managers to better see the impact of their decisions and the work force the implications of their intervention …

Division into small regional business units would also support comparative regulation – enabling the ORR to put in place a more competitive and directive form of regulation [e.g. information management protocols], which would in turn support the development of more efficient asset management practices …"

Source: Asset management implications for alternative railway structures, GHD, 2011

3

Aligns incentives (4 of 7): Previous studies undertaken by GHD suggest that efficiency savings in the order of 30% could be achieved through adopting good practice whole life asset management

Example savings from adopting good practice in asset management

Company	Outcome
Yorkshire Water	81% improvement in performance and 11% reduction in operating costs. The only A-A ranked WASC in the UK
Hunter Water (Australia)	37% reduction in operating costs per property over a 10yr period through introduction of risk based asset management
Railcorp (Australia)	30% saving on future maintenance costs through adopting Risk Based Maintenance approaches
National Grid	30% reduction in maintenance work volume through introduction of reliability centred maintenance
Energy Australia	30% saving on maintenance costs through adopting Risk Based Maintenance approaches
Seattle Utilities	Capital budget reduced by 13% and operating budget by 7% through introduction of Asset Management (first year of AMIP programme) (from EPA report)
Charlotte Mecklenburg Utilities	Reduction in capital programme of 20% (without loss of sustainable performance outcome)

GHD's comments on asset management cost savings

Savings are more generally based on 'future lifecycle cost savings' and not savings in terms of reduction in current costs

Generally, most organisations do not like to highlight the efficiency savings from Asset Management improvement programmes – as it highlights previous inefficiencies. In addition it is often difficult to measure cost reduction attributed to asset management due to the many variables involved, including external influences

Often what is seen as an asset management saving can also be interpreted as a stronger commercial focus, better demand management or deferral of major investment (all of which are arguably aspects of asset management)

GHD's comments are entirely consistent with the BR experience of Sector Management (see earlier case study)

"… In general terms, sector management represented a positive outcome helping British Rail to modernise its organisational responses and subordinate operating and engineering considerations to the fundamentals of income and expenditure …"

Source: Asset management implications for alternative railway structures, GHD, 2011

3 Aligns incentives (5 of 7): The potential incremental savings from VI as a result of alignment of incentives would be in the range of 1-5% for maintenance and renewals expenditure

- The evidence provided by Atkins and GHD show that very large cost savings (up to 30%) can be achieved through implementing good practice whole-life, whole-system asset management. Furthermore, there is strong evidence that NR was a long way from achieving good practice in this area as at the start of CP4
- However, it is important to note that many of the potential improvements highlighted by Atkins can be achieved without changing the rail industry structure and that NR is already planning to implement most of these improvements through its Transformation programme. To the extent that these improvements are already included in the baseline, they should not be included as an incremental benefit of Full VI
- GHD's view is that "delivering the necessary organisation and culture change would be more practical and achievable on a smaller regional scale", i.e. the probability and speed of achieving these improvements both increase if full accountability is given to regional business units
- However, horizontal separation with multiple owners would to some extent achieve the conditions described above, i.e. fully accountable regional business units. It is important to remember that we are evaluating Full VI in terms of its incremental impact relative to horizontal separation with multiple owners
- Full VI does deliver incremental benefits in terms of asset management by aligning incentives and facilitating market driven whole-system optimisation for a particular region. Achieving a whole industry P&L also facilitates greater commercial focus and challenge – as per BR sector management
- A number of academics have studied the impact of vertical separation on economies of scope. Their general conclusion is that there are some economies of scope from vertical integration, but there is significant uncertainty over the magnitude of these. It is very difficult (almost impossible) to isolate this impact from all of the other changes that have occurred to rail industries – and the impact is likely to vary significantly on a case by case basis due to the wide range of circumstances
- However, the addressable cost base of maintenance and renewals work is so large (£3.2bn p.a. on average in CP4 for the network as a whole) that even a small additional percentage saving would equate to a material cash saving
- Given that most of the 30% savings identified by Atkins and GHD should be delivered by the NR Transformation programme and horizontal separation with multiple owners, we estimate that the incremental impact of Full VI in this area would be 1-5%. The large size of this range reflects the fact that there is significant uncertainty over the incremental impact of Full VI. This saving equates to £3-15m p.a. for the Anglia region

3 Aligns incentives (6 of 7): Full VI should ensure that enhancements specifications are focussed on achieving train operators requirements. We have assumed that incremental savings in the range of 5-10% of NR's total enhancements expenditure would be possible

Example of positive impact of TOC engagement on enhancement projects

DfT asked Network Rail to review the costs of the Thameslink Project, particularly in the complex London Bridge area, as the emerging capital costs risked making the project unaffordable

Network Rail's Kent management reviewed the functionality required jointly with the three TOCs affected (South Eastern, Southern and First Capital Connect) and identified significant savings by simplifying the track layout without losing any critical functionality

The TOCs had not previously been proactively involved in the development of the scheme

- A recurring theme from L.E.K.'s stakeholder consultation is that enhancements cost far more than they ought to. Stakeholders provided many anecdotal "war stories" in support of this
- 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. Delivery of VfM in terms of scope is largely dependent on ORR oversight
  - NR is happy for the cost of enhancements to be added to its RAB as it receives an allowed return on its RAB
  - TOCs are largely held harmless to changes in FTAC so do not end up paying for RAB funded enhancements
- Full VI should provide the necessary incentives to maximise the benefit of each £1 of enhancement expenditure within a region – subject to:
  - Cross regional boundary considerations
  - Secondary operations considerations
- The overall magnitude of the incremental savings from Full VI is very hard to assess given the anecdotal nature of most of the evidence. However, whole-system alignment of incentives is even more critical in this area than for M&R expenditure given the importance of train operator input to optimising the specification
- As such, we have assumed that incremental savings in the range of 5-10% of NR's total enhancements expenditure would be possible. This would equate to £7-14m p.a. in the Anglia region

3 Aligns incentives (7 of 7): Full VI reduces one of the key risks of multiple owners horizontal separation, i.e. that the private sector equity owned Regional IMs adopt a very contractual approach in order to leverage their monopoly power

- Regional IMs would operate within a relatively complicated contractual and regulatory framework. This framework would aim to align incentives with train operators to prevent the Regional IMs from abusing their regional monopoly position and to ensure that they manage the fixed infrastructure on a sustainable basis
- However, any private sector equity owned Regional IMs would be under pressure to maximise returns to their shareholders within the framework described above
- This could result in a *"small numbers problem".* With a monopoly supplier and a monopoly buyer there is no equilibrium price – it depends on bargaining. This can lead to unproductive behaviours – i.e. it can increase the transaction costs of market contracts
- It is difficult to fully address this issue through externally imposed contractual and regulatory frameworks:
  - Circumstances are likely to arise which were not foreseen when the contractual and regulatory frameworks were developed
  - The behaviour of companies is partly driven by the personalities of the senior management team and the culture that develops within the firm. As a result, the same set of incentives can lead to different outcomes with different people
- A number of train operators highlighted to L.E.K. that they were concerned about how a private sector equity owned Regional IM might behave. Would they play contractual hard-ball? Would they sweat the assets (as McKinsey advised Railtrack to do)? In effect, they were concerned about the "small numbers problem"
- The most effective way of managing this risk is to adopt an industry structure that internalises these issues. Full VI is the industry structure that achieves the best alignment of incentives between the infrastructure manager and the primary train operator in regions which are relatively self contained and have a dominant train operator. If a VI entity allows the condition of assets to deteriorate then it is likely to be its own train services that suffer the most

4 Greater transition cost and risk: L.E.K.'s view is that this is not a strong argument for not doing Full VI. However, it is an argument for following an evolutionary approach

- Full VI involves bringing together two very different types of business within a single entity (at least at the holding company level)
- There are relatively few companies that currently have extensive experience of both train operations and rail infrastructure management at senior levels in the firm
- It would clearly be possible for companies to develop both sets of competencies in-house over time, or to obtain them through JVs or other forms of alliancing. Furthermore, many staff would TUPE across from NR
- However, there would still be a risk during the early years of a Full VI entity that some senior managers would be operating outside their field of experience. History suggests that mistakes could be made in such situations:

  "… after a rough start-up due to the inexperience of the private operators (some of whom, for example, underestimated the number and skill level of drivers needed) …"

  "… it seems clear that Railtrack management never fully got control of its responsibility for track maintenance and rehabilitation …"

  Privatising British Railways, Are there lessons for the World Bank and its borrowers?, Lou Thompson
- One bank interviewed by L.E.K. highlighted that HS1 was an attractive investment because the assets were relatively new and that by the time significant work needed doing the owner would have had a chance to understand what they had bought. Senior management would not have the luxury of this lengthy period of low renewals and enhancements requirements for most of the rest of the network
- L.E.K.'s view is that this is not a strong argument for not doing Full VI. However, it is an argument for following an evolutionary approach
- Furthermore, L.E.K. would not expect the cost of letting a VI concession to be materially different to the cost of letting separate Regional IM concessions and long term train operations franchises (there would be some incremental costs but also some significant synergy benefits)

5 The flexibility of a "quasi-vertical integration" approach should allow VI entities to mitigate much of the risk from mixing together two fundamentally different types of business

- The last slide highlighted the transition risks associated with mixing together two fundamentally different types of business. In addition, there is an ongoing issue. As highlighted in the earlier section on management theory, managing strategically different businesses increases administrative costs
- It is therefore not surprising that the appetite for Full VI varies significantly between the TOC owning groups. Whilst some are strong supporters of VI, others have a clear preference for other structural options
  - Similarly, some TOC owning group shareholders might not appreciate such a significant change in the nature of the business
- However, to return again to the conclusions from the management theory section, the "vertical integration" option for the rail industry should not be thought of solely 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
- Supply chain options that fit within the "quasi-vertical integration" framework include (inter alia):
  - In-house delivery of most activities by a single organisation
  - JV between a train operator and an infrastructure management company
  - Many other forms of partnership between the train operator and the IM company – which could include cost and revenue sharing arrangements
- As such, under the "quasi-vertical integration" concept TOC owning groups would be free to structure the value chain in the way that best suits them. They could transfer whatever responsibilities and risks they wanted to supply chain partners

6 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 (1 of 4): Introduction

- The Major government's fundamental stated objective for restructuring and privatising the GB rail industry was to introduce "competition, innovation and the flexibility of private sector management [that] will enable the railways to exploit fully all the opportunities open to them"
- Major's government considered four broad options for restructuring and chose to separate infrastructure from all operations in order to maximise the benefits from competition
- The EU's requirements for vertical separation between train operations and infrastructure management are also driven by a desire to promote competition between train operators, including potential new entrants
- Several other regulated markets have also moved further in the direction of separation in order to promote competition in the contestable parts of the market
- A move back to vertical integration could be viewed as a move against the tide. At the very least, it would be essential to prevent any negative impacts on competition

Source: Privatising British Railways, Are there lessons for the World Bank and its borrowers?, Lou Thompson

6 Potential negative impact on "competition in the market" (2 of 4): There is effective competition in the market between freight operators but the extent of competition in the market between passenger train operators varies significantly by geography

- The final approach to privatisation adopted by the Major government placed much greater reliance on "competition for the market" and much less reliance on "competition in the market" for passenger services

  "…It is important to note, however, that the initial objective of competition between and among franchises in the same markets on the network was greatly curtailed before privatisation. The Government team involved in the restructuring soon realised that competition in the various specific markets would highlight the cross-subsidies inherent in the franchise areas, and could well actually increase the total support required. The franchising was thus based on competition **for** the various franchise areas, and made very limited use of competition **in** particular markets as a tool for promoting efficiency and attempting to reduce costs. In effect, the stated objective of promoting competition **in** the markets for passenger transport, which influenced the initial decision to separate infrastructure from operations and to create 25 franchises, had to be balanced against other objectives, which, had they been fully incorporated at the beginning, might have led to a different organisational structure …"

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

- The extent of competition in the market between passenger train operators varies significantly by geography:
  - There is no competition between passenger train operators on most routes
  - There is competition between franchised TOCs on quite a number of routes, particularly on the geographic boundaries between franchises or where an inter-city TOC shares a route with an LSE or regional TOC
  - There are five open access operators, three of which compete with franchised TOCs (First Hull Trains, Grand Central and Wrexham & Shropshire)
- The DfT's January 2011 policy statement on rail franchising indicates that the DfT intends to continue to rely primarily (but not exclusively) on competition for the market for passenger rail services
- Academics that have reviewed the impact of restructuring rail industries are almost universal in agreeing that vertical separation has been successful in promoting strong competition in the market between freight operators and that this has led to significant efficiency gains in the freight sector

6 Potential negative impact on "competition in the market" (3 of 4): 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

- There is a risk that a Full VI entity could have a negative impact on competition in the market as a result of prioritising its own interests in a number of areas, such as signalling priorities, possessions planning and enhancements
- The affected services could include both competing and non-competing (e.g. freight) secondary operator services
- 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
- The difficulty of achieving this objective varies significantly by geography. It is much easier in a relatively self contained geography with a dominant operator than it is for complex multi-user routes such as LNE and LNW
- A number of different mechanisms could be used to achieve this objective including – retaining some centralised functions, legal and process safeguards, and incentives. Each of these is discussed further on the next slide
  - Some key functions such as timetabling and capacity allocation would in any event have to be independent from the train operations part of a Full VI entity in order to comply with EU legislation
- In addition, it would require the regulator to be very firm in ensuring that these mechanisms work in practice
  - the regulator would have to make it very clear to any VI entities that any attempts to favour their own services over those of other operators would simply not be tolerated
- Providing that the safeguards outlined on the next slide are implemented, and that the regulator is fully committed to the principles outlined above, and has the resources and powers to enforce them, then L.E.K. thinks that it should be possible to avoid secondary operator services being negatively impacted by Full VI in relatively self contained regions with a dominant operator. This has already been achieved in a number of countries, such as the US and Japan

6 Potential negative impact on "competition in the market" (4 of 4): There are three main types of mechanism for protecting secondary operators in areas where Full VI has been implemented

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

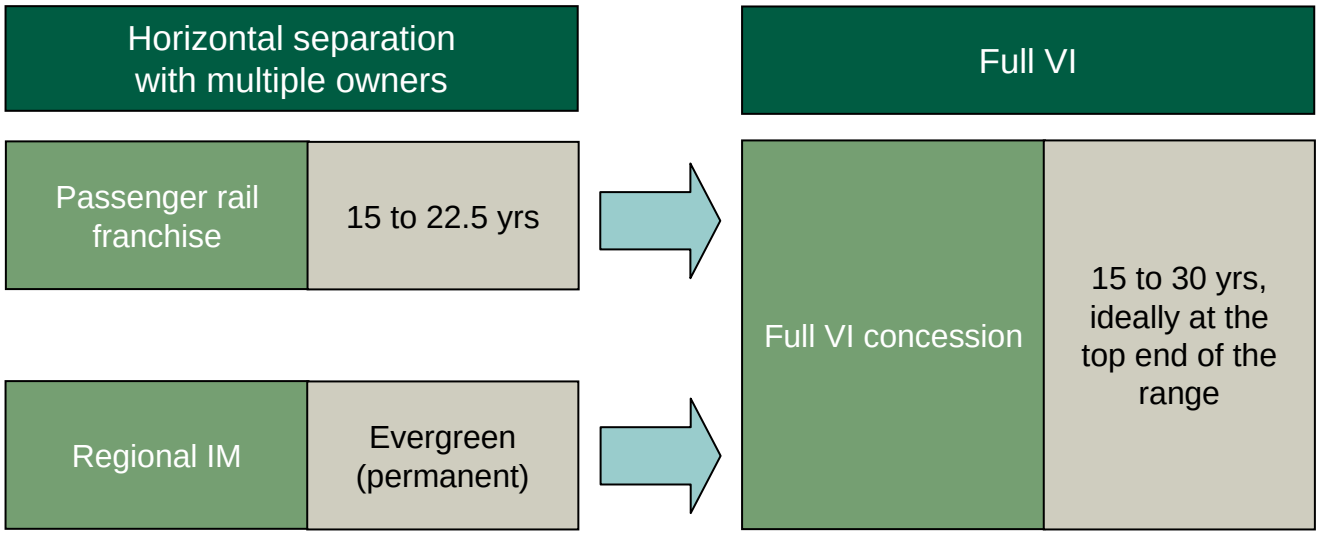
7 Potential negative impact on "competition for the market": Reduced intensity of initial bidding if some TOC owning groups do not want to bid for a VI concession

- L.E.K. has conducted one-to-one interviews with all major TOC owning groups and a number of potential new entrants to the UK market. As highlighted earlier, the appetite for Full VI varies significantly between the TOC owning groups, with some being strong supporters and others having a clear preference for other options
- The overwhelming majority of TOC owning groups said that they would bid for a Full VI concession and the others reserved their position – they would need to see the details of the proposition and conduct board level discussions before making a decision. None of the TOC owning groups ruled out bidding for a Full VI concession at this stage
- L.E.K. is aware that a number of major construction and infrastructure management groups would also be keen to work with train operators to deliver a joint bid for a VI concession
- L.E.K. interviewed one of the major infrastructure investment banks to understand the appetite for investing in Regional IMs or Full VI concessions. They highlighted that there is currently a very strong market demand for these types of investment, but demand does fluctuate over time. It would be important to make the proposition as clear as possible to help investors to get comfortable with the risks
- The investment bank also highlighted that competition for the first Full VI concession could be intense if the market thought that it was the first of several because bidders would be keen to secure a first mover advantage

The feedback from the market is that there would probably be strong competition for Full VI concessions

8 VI combines together two different types of business – IM and train operations. In order for the business to remain vertically integrated the concession length needs to be the same for the two halves of the business. This requires a degree of compromise and could have a negative impact on VfM (1 of 5)

Assumed concession lengths



8 Potential negative impact from adopting a "compromise" concession length (2 of 5): Regional IM

- For Regional IMs, longer concession terms have significant VfM benefits. An evergreen licence, regulated by ORR, similar to other regulated utilities appears to be the most attractive option for independent ownership of Regional IMs
  - 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 concession term of 15-30 years would not fully capture this benefit without regulatory incentives. This is because of the mature nature of the asset base in a Regional IM which would require asset renewals 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
  - as a result, a 15-30 year concession would increase reliance on the ORR to enforce good whole-life asset management behaviour
  - the ORR is already monitoring the sustainability of NR's asset policies

- In terms of the upfront value implications for the concession-letting process, amounts raised should not be too different for a 30 year concession as they would be for sale of an evergreen licence
  - the HS1 experience suggests little impact to sale value as a result of selling a 30 year concession rather than rights in perpetuity

8 Potential negative impact from adopting a "compromise" concession length (3 of 5): Passenger rail franchise

- We highlighted in the Option Development section that the longer the concession term, the greater the uncertainty in many areas including macroeconomic development, relative competitiveness of rail and other transport modes, government policy and supply side developments. As such, the longer the concession term …
  - "…the greater the likelihood that the DfT will want to make significant changes to the specification – relating to both fixed infrastructure and train operations. Therefore, the greater the need for an effective change mechanism …"
  - "…the greater the need for an effective risk sharing mechanism if specifications restrict the concessionaire's flexibility (as appears likely to be the case) …"
- As such, we recommended that, if the VI concession length is greater than 15 years, and the DfT's approach to specification significantly restricts the concessionaire's flexibility, then some form of ORR led periodic review process should be applied to the train operations component of a VI concession
- A key issue is whether setting franchise payments for a VI concession through a regulatory review would cause a reduction in VfM relative to holding another competition for the market
- The DfT's January 2011 policy statement leaves open the possibility that some form of review process could be applied to normal passenger rail franchises: "we will consider inclusion of a review mechanism on a franchise by franchise basis. This could be an important mechanism to re-set important elements of longer franchises, such as risk and revenue assumptions". We have assumed for the purposes of this evaluation that the DfT does not implement these mid-franchise reviews
- As such, the relevant comparison is between:
  - Two 15 year franchises back to back, each let through a competition for the market
  - One 30 year Full VI concession let through a competition for the market but with periodic reviews at the 15, 20 and 25 year points. There is no reason why the periodic reviews should start earlier for the train operations part of a Full VI concession than they would under the DfT's standard franchising approach
- The alternative would be to assume that the DfT does implement mid-franchise reviews on standard franchises. In which case we would assume, for consistency, that periodic reviews of the train operations component of a Full VI concession would take place throughout the concession term

8 Potential negative impact from adopting a "compromise" concession length (4 of 5): Passenger rail franchise – the VfM impact of applying regulatory reviews to the train operations part of a VI entity would depend on the DfT's approach to specification

- The DfT's standard franchising model includes a change mechanism and the potential for a revenue risk sharing mechanism based on macroeconomic factors. It also includes the potential for a review mechanism which would act as a second mechanism for both implementing changes and managing risk
- The key driver of the need for these mechanisms is the DfT's approach to franchise specification. Specifications reduce the flexibility available to TOCs to adapt their businesses to reflect changing circumstances. In the absence of specifications, none of these mechanisms would be required – indeed these sorts of mechanisms do not exist in most industries
- As such, the VfM impact of applying regulatory reviews to the train operations part of a VI entity would very much depend on the DfT's approach to specification. There is currently significant uncertainty regarding this because the DfT has just changed its franchising policy but has not yet procured a new franchise using the new model
- The VfM impact would further depend on the regulator's approach to carrying out the regulatory reviews
- However, in order to develop a broad brush estimate of the potential VfM impact L.E.K. has compared the average profit margin of TOCs whose franchise payments were set through competition for the market with those for TOCs who were on management contracts
  - This should be treated as an upper bound estimate. In theory, bidders for the Full VI concession should take this potential upside into account when developing their bids and reflect it in their as-bid price

8 Potential negative impact from adopting a "compromise" concession length (5 of 5): There is some evidence that management contracts have led to TOC costs increasing more quickly than in situations where the TOC takes the full cost risk

Growth in unit TOC costs by contract type

	1997 – 00 (Before period of alternative contract arrangements)	2000 – 04 (Period of alternative contract arrangements)	2004 – 06 (Contract arrangements unwound)
TOCs on management contracts	(6.1)% p.a.	6.8% p.a.	1.6% p.a.
TOCs on re-negotiated contracts	(7.8)% p.a.	7.1% p.a.	3.7% p.a.
Other TOCs	(3.6)% p.a.	5.0% p.a.	4.7% p.a.

1.8% p.a. additional cost growth for TOCs on management contracts

- Around 2000, the SRA performed mid-term re-negotiations with a number of TOCs which had run into financial difficulties
  - 4 contracts were re-negotiated with higher subsidy
  - 9 contracts were subject to annual negotiation on a cost plus basis (management contract) also with higher subsidy
- As shown in the table, TOCs on management and re-negotiated contracts experienced higher growth in unit costs than other operators over the period
- Two possible explanations are put forward by Smith and Wheat in their 2010 paper on this subject:
  - 1) the problem TOCs may have reduced costs too far pre-2000, and so were later forced to increase them at a faster rate
  - 2) the alternative contract arrangements weakened cost control incentives amongst the affected TOCs
- We have used Smith and Wheat's two hypotheses to develop a range of estimates for the impact of setting franchise payments for years 15-30 of a VI concession through regulatory reviews instead of through competition for the market
  - Low case: Assume hypothesis 1 is true and that there is no impact from using regulatory reviews to set franchise payments
  - High case: Assume hypothesis 2 is true and that there is 1.8% p.a. cost growth above the baseline for four years from Year 16 (i.e. leading to a cumulative cost increase of 7.3%. This is partly offset by a decrease in margin to reflect the revised risk characteristics of the regulatory review arrangement, assumed to be a step-change impact of 1% (this is roughly a quarter of a typical franchise bid margin)

Source: "The effect of franchising on cost efficiency", Smith and Wheat, 2010

Full VI cost – benefit analysis (1 of 4): Principles underpinning cost-benefit analysis of Full VI option

1. The Full VI option is being evaluated relative to the multiple owners horizontal separation option, not relative to the status quo
    - L.E.K. believes that there would be very significant benefits from introducing comparative regulation to the rail industry. These benefits are captured by the multiple owners horizontal separation option. As such, the benefit of moving from the status quo to the multiple owners horizontal separation option is much larger than the incremental benefit of moving from the multiple owners horizontal separation option to Full VI
2. There is a very high level of uncertainty regarding the magnitude of each impact for a number of reasons. These include – the dynamic nature of the status quo scenario with significant savings due to be delivered in CP4 and CP5, and the recent change in DfT's franchising policy, with several important aspects of the policy still undecided
3. The relative attractiveness of Full VI and multiple owners horizontal separation varies significantly between regions. It is critically dependent on the relative scale of transaction costs and administrative costs. These in turn depend on a number of factors such as the likely need for close co-operation between train operators and the Regional IM to deliver programmes of work, together with the extent and nature of secondary operator services
4. Given the scale of uncertainties, L.E.K. would not recommend a "big bang" roll-out of Full VI. If this option is selected then it should be implemented in a geography such as Anglia and information obtained from that region should help to inform subsequent decision making
5. The cost-benefit analysis contained in this presentation should only be used for the purposes of a threshold test to determine whether to proceed with letting the first Full VI concession
6. L.E.K. has assumed that roll-out of Full VI would be aligned with the end dates of existing franchises – potentially with a few short term extensions in order to improve the timing (e.g. to align with the end of major infrastructure projects). We have assumed that the DfT would not terminate any franchises early

Full VI cost – benefit analysis (2 of 4): Indicative incremental benefits of Full VI in the Anglia region (vs. having a vertically separate but independently owned Regional IM)

INDICATIVE

Indicative incremental benefits of Full VI in the Anglia region

	Advantages		30 year NPV* (£m)	Comments
1	Reduced interface management costs		30 - 129	• Academic research (Merkert et al 2008) estimated this to be 1-2% of total costs. L.E.K. has used Merkert's low case as its high case (i.e. 1%) • L.E.K.'s low case is based on a high level bottom up analysis and discussions with NXEA management • This leads to a range of £2-10m p.a. for the Anglia Region
2	Give overall operational control to train operators		89	• Assume 1ppt increase in PPM delivered over the first five years. This equates to a total steady-state revenue uplift of £6m p.a. • Cost savings assumed to be included in the "reduced interface management costs" item above
3	Align incentives and facilitate market driven whole-system optimisation	Asset management	39 - 195	• Atkins and GHD have highlighted that savings of 30% are possible from achieving good industry practice in asset management • The overwhelming majority of that benefit should be achieved through NR's Transformation programme and multiple owners horizontal separation • L.E.K. has assumed that the incremental benefits from Full VI facilitating whole system alignment of incentives is 1-5% of NR's M&R expenditure
		Enhancements	45 - 90	• NR's Transformation programme and multiple owners horizontal separation should also deliver significant improvements in enhancements expenditure • The incremental benefits from Full VI facilitating whole system alignment of incentives should be higher for enhancements than for NR's M&R expenditure due to the importance of train operators' input to enhancement specifications. As such, L.E.K. has assumed that the incremental benefits would be 5-10% of NR's enhancement expenditure
	Total		203 - 503	

Note: *NPV in 2010/11 pounds assumes full VI from 2014/15 for a 30 year concession, discounted using a real 3.5% discount rate

INDICATIVE

Full VI cost – benefit analysis (3 of 4): Indicative incremental costs of Full VI in the Anglia region (vs having a vertically separate but independently owned Regional IM)

	Disadvantages	30 year NPV* (£m)	Comments
4	Greater transition cost and risk	Small	• The main transition costs and risks are associated with moving from the current situation to horizontal separation with multiple owners. The incremental cost of moving from HS with multiple owners to Full VI is relatively small • L.E.K. would not expect the cost of letting a VI concession to be materially different to the cost of letting separate Regional IM concessions and long term train operations franchises
5	Mixing together different types of business	Small	• "Quasi-vertical integration" model enables TOCs to structure the value chain in the way that best suits them
6	Potential negative impact on "competition in the market"	Small (providing that the necessary safeguards are implemented and enforced)	• This is the most important potential downside of Full VI. However, providing that the safeguards outlined earlier are implemented, and that the regulator 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 Full VI in relatively self contained regions with a dominant operator. This has already been achieved in a number of countries, such as the US and Japan
7	Reduced intensity of bidding	None	• Feedback from the market is that there would probably be strong competition for a Full VI concession
8a	Compromise to Regional IM concession length	Evidence from HS1 suggests limited upfront	• HS1 experience suggests little impact to sale value as a result of selling a 30 year concession rather than rights in perpetuity • Some risk of impact on infrastructure management incentives towards end of concession
8b	Compromise to franchise length	(151) – 0	• Low case: Assume that there is no impact from using regulatory reviews to set franchise payments • High case: Assume that there is 1.8% p.a. cost growth above the baseline for years 15-30, partly offset by a 1% decrease in margin. This is based on Smith and Wheat's 2010 analysis of the SRA's franchise renegotiations
	Total	(151) 0	

Note: *NPV in 2010/11 pounds assumes full VI from 2014/15 for a 30 year concession, discounted using a real 3.5% discount rate

Full VI cost – benefit analysis (4 of 4): Indicative incremental costs and benefits for all regions where the primary TOC accounts for at least 70% of the total train kms on the route

Region	Primary TOC's share of region's total train kms (%)	Interface issues (H/M/L)		30 year NPV (£bn)			Comments INDICATIVE
		Pax TOCs	Freight	Benefits	Costs	Net benefits	
Scotland	86	Medium	Medium	0.6 - 1.5	(0.1) - 0	0.5 - 1.5	Not a DfT decision
Sussex	84	Medium	Low	0.2 - 0.4	(0.2) - 0	(0.0) - 0.4	
Kent	81	Low	Low	0.2 - 0.5	(0.2) - 0	0.0 - 0.5	
Wessex	80	Medium	Medium	0.2 - 0.5	(0.2) - 0	0.0 - 0.5	
Anglia	79	Low	High	0.2 - 0.5	(0.2) - 0	0.1 - 0.5	
Northern	74	High	Medium	n/a	n/a	n/a	Excluded because interface issues too material for VI to be considered in the short/medium term
Wales	73	Medium	Medium	0.2 - 0.4	(0.1) - 0	0.1 - 0.4	
Western	71	Medium	Medium	0.3 - 0.6	(0.2) - 0	0.0 - 0.6	
Total				1.8 4.4	(1.1) 0	0.7 4.4	

- These should be considered very high level indicative estimates only. They have been derived by applying the Anglia analysis to other regions: benefits are scaled based on infrastructure costs; incremental VI costs scaled based on TOC costs
- Merseyrail has been excluded because its scale is so different to the Anglia region that pro-rating the Anglia impacts would not be appropriate

Full VI option evaluation summary

- 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"
- Full 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 Full 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 Full VI in these regions
- However, there are many other parts of the network where the disadvantages of Full 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 Full 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 regulator 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 Full 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 Full VI in practice, we would strongly recommend a phased roll-out whereby Full 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 Full VI

L.E.K.'s evaluation of the Operations VI option focuses on how this option differs from multiple owners horizontal separation and Full VI

Level	Incremental responsibilities transferred from Infraco to TOC	Comments	Consider further as VI option?
Level 1	Maintenance, renewal and enhancement of all stations and light maintenance depots	Current arrangements are unnecessarily complicated. There is a cross-industry consensus that the arrangements should be greatly simplified by making a single party responsible for the management of each station The DfT's new franchising policy reflects this so L.E.K. has treated this as part of the baseline rather than a VI option	No
Level 2	Signalling operations, management of control centres and mobile operations managers, performance management	Transfers all operational responsibilities to train operators, i.e. it transfers NR's Route Director responsibilities. This would reduce the complexity of the operational interface and streamline decision making. Arrangement already in place for Tyne & Wear Metro concession	Yes **"Operations VI"**
Level 3	Maintenance of all other fixed infrastructure	Transfers all other "line job", i.e. non-project, work to the train operator. However, this would cause a split in the responsibility for key assets which would make whole-life asset management trade-offs much more difficult. Not considered further because of this	No
Level 4	Renewal and most enhancements of all other fixed infrastructure	Full vertical integration for everything except major enhancements (i.e. includes all of the incremental items described under options 1 4) Would provide a "line-of-sight" from market demand right through to long term infrastructure decisions	Yes **"Full VI"**
Level 5	Major enhancements	A relatively minor variant on Level 4 (depending on the definition of "major") to cover enhancements that either impact multiple regions or have a very material impact on the business risk of a single region, thereby changing the nature of the business towards more of a construction focus	No

Operations VI cost – benefit analysis (1 of 2): Operations VI would deliver significantly less benefit than Full VI

Indicative benefits of Full VI and Operations VI in the Anglia region

	Advantages		30 year NPV* (£m)		Comments
			Full VI vs HS	Operations VI vs HS	INDICATIVE
1	Reduced interface management costs		30 - 129	15 - 65	• Operations VI would simplify the current interface by removing it from the control room • However, contractual interfaces would still exist as TOCs and Regional IMs would still be separate • Assume that Operations VI achieves half of the Full VI savings
2	Give overall operational control to train operators		89	89	• Operations VI would achieve substantially all of the Full VI savings
3	Align incentives and facilitate market driven whole-system optimisation	Asset management	39 - 195	None	• No benefit from Operations VI
		Enhancements	45 - 90	None	• No benefit from Operations VI
	Total		203 - 503	104 - 154	

Note: *NPV in 2010/11 pounds assumes full VI from 2014/15 for a 30 year concession, discounted using a real 3.5% discount rate

Operations VI cost – benefit analysis (2 of 2): Operations VI would have lower costs that Full VI, but this is not sufficient to offset the lower benefits shown on the last slide

Indicative costs of Full VI and Operations VI in the Anglia region

	Disadvantages	30 year NPV* (£m)		Comments (INDICATIVE)
		Full VI vs HS	Operations VI vs HS	
4	Greater transition cost and risk	Small	Small	• Relatively small under both scenarios
5	Mixing together different types of business	Small	None	• The responsibilities transferred to TOCs under Operations VI are operational in nature so do not result in a mixing of different types of business
6	Potential negative impact on "competition in the market"	Small (providing that the necessary safeguards are implemented and enforced)	Small (providing that the necessary safeguards are implemented and enforced)	• Operations VI has similar risks to Full VI in terms of the potential negative impact on secondary train operators. However, the scope of activities which could lead to these negative impacts is reduced • As highlighted earlier, L.E.K. believes that it should be possible to mitigate this risk effectively
7	Reduced intensity of bidding	None	None	• No material impact under either scenario
8a	Compromise to Regional IM concession length	Evidence from HS1 suggests limited upfront	None	• No impact under Operations VI as Regional IMs would remain permanent businesses rather than finite duration concessions
8b	Compromise to franchise length	(151) - 0	None	• No impact under Operations VI as there would be no change to the DfT's standard franchise length
	Total	(151) 0	Small	

Note: *NPV in 2010/11 pounds assumes full VI from 2014/15 for a 30 year concession, discounted using a real 3.5% discount rate

Operations VI evaluation summary: L.E.K. does not recommend pursuing the Operations VI option any further

Indicative benefits and costs of Full VI and Operations VI in the Anglia region

	30 year NPV* (£m)	
	Full VI vs HS	Operations VI vs HS
Benefits	203 - 503	104 - 154
Costs	(151) - 0	-
Net benefits	52 - 503	104 - 154

- L.E.K.'s indicative cost – benefit analysis indicates that Operations VI adds a small amount of incremental value relative to multiple owners horizontal separation in regions which are relatively self contained and where there is a dominant operator
  - However, Operations VI should not be viewed as an alternative to multiple owners HS. The latter has very large net benefits relative to the status quo which Operations VI would not capture without multiple owners HS
- However, Operations VI has significantly lower net incremental benefits that Full VI in relatively self contained regions
- Furthermore, there are unlikely to be any regions which are suited to Operations VI but not Full VI. The key risk for both is the potential negative impact on secondary operators services. Part of the strategy for mitigating this risk is to restrict any form of VI to relatively self contained parts of the network which have a dominant operator
- As such, L.E.K. does not recommend pursuing the Operations VI option any further

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What is vertical alignment and what issues does it seek to address?

What is vertical alignment (VA)?

- According to the ITT, the vertical alignment option would involve *"some Network Rail functions being provided by a joint venture between Network Rail and the dominant train operator in that region"*
- L.E.K. would include a broader range of joint working arrangements within the definition of "vertical alignment"

What issues does VA seek to address?

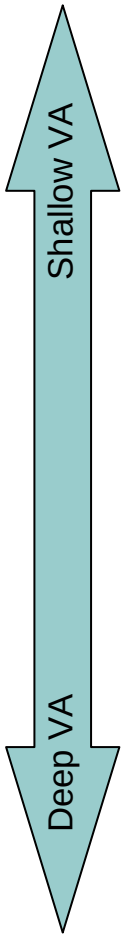
- NR has a monopoly position and does not have any close comparators. As a result, it does not face the level of external pressure required to ensure that it is responsive to its customers and delivers VfM for its funders and customers — (✓)
- Further issues result from its current highly centralised management approach — ✓
  - Reduced rate of innovation
  - Slow decision making in some situations
  - Harder to achieve locally optimised solutions

Incremental to Horizontal Separation

- 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) — (✓)

It is important to note that the Vertical Alignment option is being evaluated in terms of its <u>incremental</u> benefit relative to Horizontal Separation and Vertical Integration, not relative to the current arrangements

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". Please refer to the later Cost and Revenue Sharing section for an evaluation of this option
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. These options are examined in this section
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 earlier VI section

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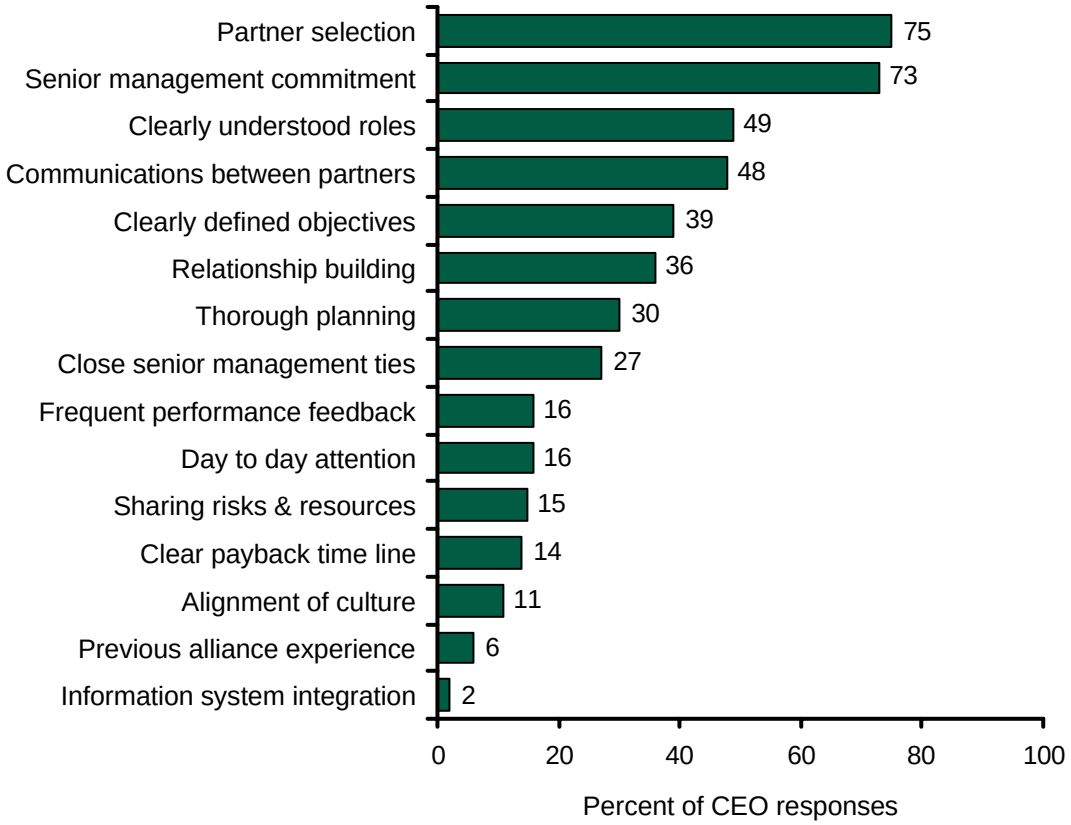
Partner selection and senior management commitment are the two most important success factors for alliances

Reasons for the success of alliances (n=450 CEOs)



Essential

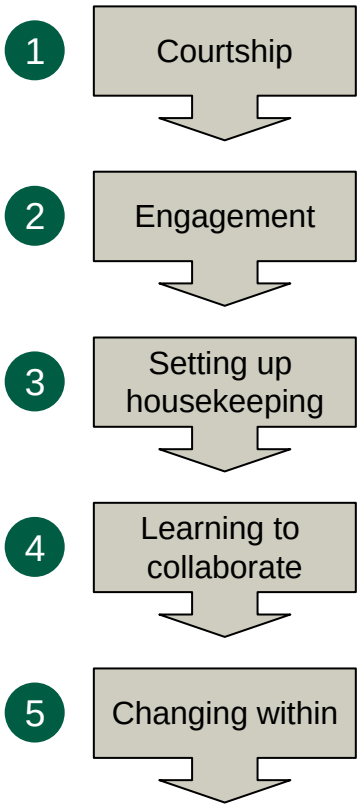
Important

Worthwhile

Source: Data Quest

Effective partnering needs to be developed over time. Often successful partnerships will begin with a simple contracting relationship then evolve through increased dependency

Development of a successful partnership



Two companies meet, are attracted and discover their compatibility

Draw up plans and close the deal

Two companies discover that they have different ideas about how the business should operate

Devise mechanisms for bridging those differences and develop techniques for getting along

Each company discovers that it has changed internally as a result of its accommodation to the ongoing collaboration

- The formation of an alliance, like real relationships, are unique and need to be formed over time

  "… Relationships between companies begin, grow, and develop – or fail – in ways similar to relationships between people, No two relationships travel the same path…"
  Harvard Business Review, August 1994

  - the implications for a GB Rail alliance is that results will not necessarily be revealed immediately after any structural change. The success very much relies on the alignment of cultures and the building of relationship between the parties which is likely to take time and be an iterative process

- Depending on the success of the relationship, the type of partnership may evolve and can lead to other similar agreements

  - for example, an alliance between the two largest players in a speciality medical device segment, Red Cell Corporation and White Cell Incorporated, progressed from an arm's length purchasing union, to a manufacturing-supply relationship and finally to a jointly owned NewCo

- The earlier section on "management theory on the scope of the firm" provides further insights into how a number of leading firms have adopted "quasi-vertical integration" and "relational contract" models

Source: Collaborative Advantage: The Art of Alliances, Harvard Business Review, August 1994

Examples of good and bad alliancing

Tubelines Public Private Partnership

- 30 year, highly-specified contract covering activities, KPIs and required outputs
- PPP structure was highly political and put in place against TfL's wishes, resulting in a perceived lack of commitment to development of a working partnership from the outset
- Tubelines sub-contracts were awarded following open competition, with the objective of securing good value delivery of maintenance and renewals activity
- However, over time an adversarial approach between Tubelines and TfL, reinforced by difficulties in completing an ambitious programme of work, led the situation to deteriorate
- Changing requirements for the network led to TfL buying out Tubelines and conducting significant re-programming of work to reduce activity and save cost

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AgustaWestland / MoD Integrated Merlin Operational Support contract

- AgustaWestland heavily incentivised to commit to a partnership strategy with the MoD, in support of its procurement strategy, through conditional award of Future Lynx construction contract
- Principles of the partnership laid out in a non-contractual Strategic Partnering Agreement, reinforced with separate contract governing outputs
- Significant time and investment in developing the partnership had taken place before the formal contract was signed
- Co-location and joint teams resulted in improved data availability on both sides, eliminating disagreements on data, and fostering trust and collaboration
- Overall, the partnership has delivered increased outputs and lower costs than originally anticipated
- Partnership also had sufficient resilience and resources to respond to unexpected events, e.g., Merlin airframe corrosion issues

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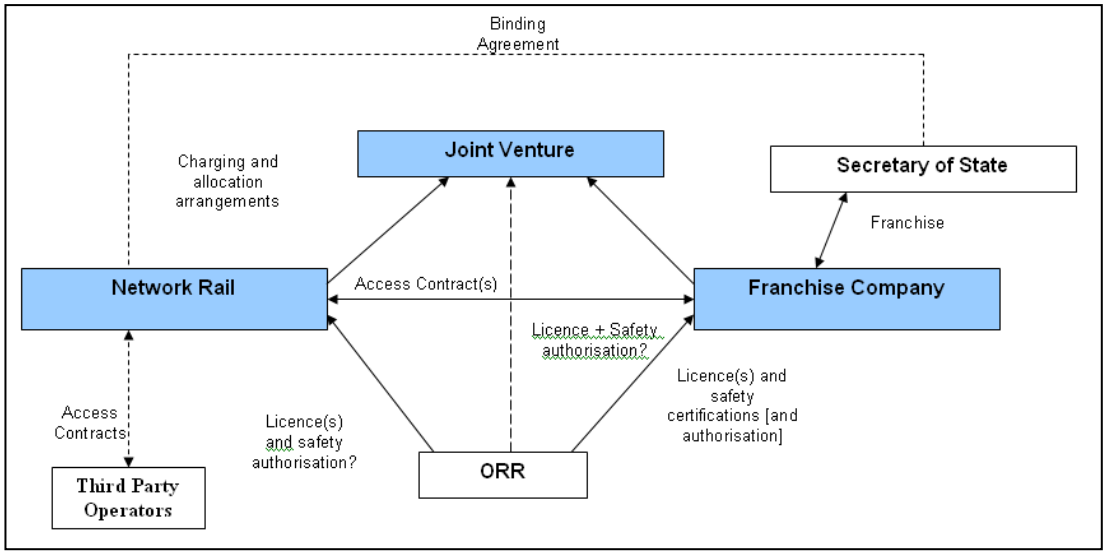
The DfT/ORR have developed a potential structure for the vertical alignment JV options in which responsibility for charging and capacity allocation sits outside the JV

DFT/ORR's potential structure for vertical alignment JV options



L.E.K. does not envisage any difference between the horizontal separation and vertical alignment JV options in terms of the roles, responsibilities or ownership of Central Functions

Source: DfT/ORR

- There are a number of potential legal issues associated with the vertical alignment JV options. These include the requirement for certain infrastructure management "essential functions", such as capacity allocation and charging, to be carried out independently from train operations
- The DfT and ORR have analysed these issues and believe that they can be overcome. For example, they have developed the potential JV structure shown opposite in which charging and capacity allocation take place outside the vertically integrated entity
  - It should be noted that the structure shown opposite is not the only option
- We understand from the DfT/ORR that there may also be legal benefits in the potential for a JV being explicitly mentioned during any franchise bidding processes
- L.E.K. has not obtained any independent legal advice and offers no opinion on the various potential legal issues
- However, L.E.K. agrees that capacity allocation should be independent of the JV in order protect the interests of other train operators

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 would not have any freedom of choice over partner selection as there would be a single monopoly IM in each region. The Regional IM would also face a similar situation although there would typically be a number of different train operators in a region with significantly different shares of the train kilometres
- 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
  - Mandating JVs through the franchise letting process would place TOCs in a very weak negotiating position
  - Some stakeholders stated that they would prefer voluntary JVs to Full VI, but would prefer Full VI to mandatory JVs

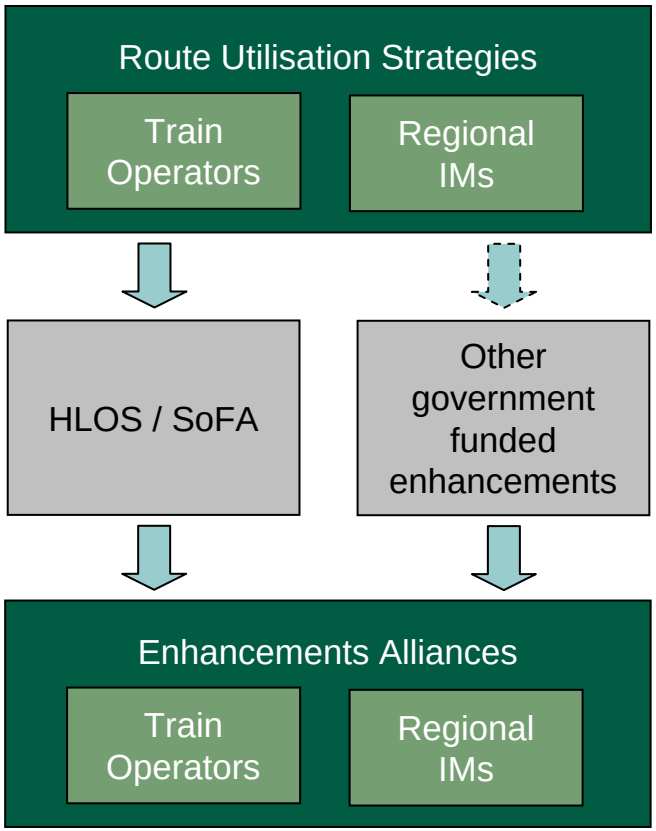
The scope of vertical alignment JVs can be thought of in terms of five different groups of activities, although it is recognised that a JV could include any bespoke set of activities

Potential scope of activities for vertical alignment JVs

Group	Scope of activities	Comments	Considered further as a JV option?
1	Train and/or station operations	Some or all of the activities currently carried out by TOCs could theoretically be included in the JV. However, the TOC owner groups interviewed by L.E.K. were reluctant to do this, with the exception of items closely related to group 3 below. Furthermore, we understand from the ORR/DfT that there may be legal barriers to NR undertaking train operations	No
2	Maintenance, renewal and enhancement of all stations and light maintenance depots	The DfT's January 2011 franchise policy document states that "government believes that the management of stations would benefit from clear leadership by a single party". As such, the interfaces and incentives for stations should be addressed through the new franchising approach	No
3	Signalling operations, management of control centres and mobile operations managers, performance management	These are the activities where TOCs and NR have the closest day-to-day working relationships and the activities that are most often included in existing partnership arrangements. As such, these activities could form an important part of JVs A JV that only included these activities would be analogous to Operations VI (although the exclusion of activity groups 1 and 2 would be an important difference)	Yes
4	Maintenance and renewal of all other fixed infrastructure	TOCs generally have very little involvement with these activities under existing arrangements. However, there are potentially significant benefits from joint working, particularly in terms of trade-offs relating to possessions and speed restrictions	Yes
5	Most enhancements to fixed infrastructure	TOCs currently have some involvement in the early planning of fixed infrastructure enhancements through the RUS and HLOS processes. However, there is evidence to suggest that NR's detailed specification of enhancements drives significant costs which do not deliver commensurate benefits for TOCs. Giving TOCs a direct involvement in specifying and delivering enhancements through a JV could address this issue	Yes

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 planning and delivering enhancements



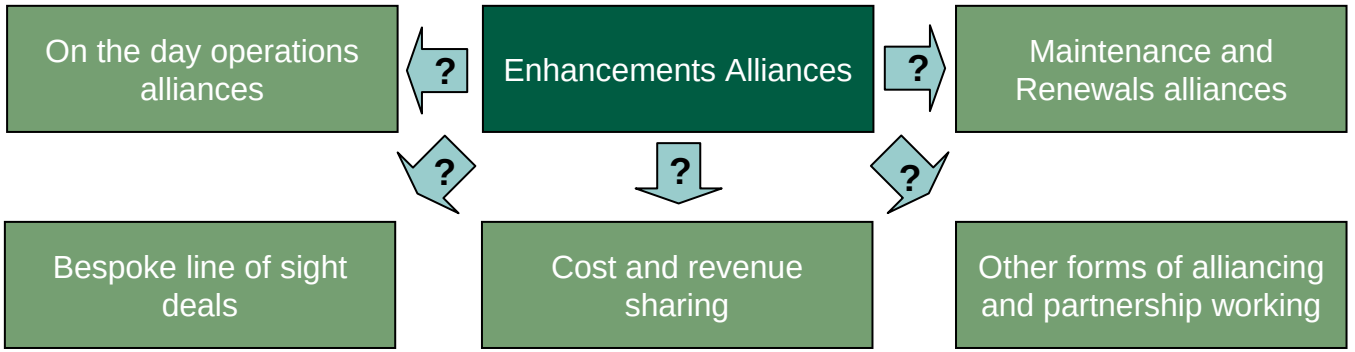
- A recurring theme from L.E.K.'s stakeholder consultation is that enhancements cost far more than they ought to
- One of the key issues is that the industry sees enhancements as a free good. Neither NR nor TOCs typically have an incentive to value engineer schemes to ensure that they deliver the required 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. Delivery of VfM in terms of scope is largely dependent on ORR oversight
- One way of addressing this would be for most government funding for enhancements to go through some form of alliance 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 alliance might be justified because train operators and IMs are both important stakeholders in this area. The Enhancements Alliance would give the train operators a clienting role in relation to enhancements
- Further work would be required to develop the details of how these would work such that train operators and NR are both comfortable with the allocations of risks, accountabilities and responsibilities

There are a number of mechanisms that the ORR could use to manage the risk of enhancement alliances gold plating their initial proposals for schemes in order to secure additional funding

- The key issue would be how to ensure that enhancement alliances are given the appropriate amount of funding to achieve government's objectives, as specified in HLOS and elsewhere. There is a risk that the alliances would gold plate the initial proposals for schemes in order to secure additional funding. They could then "value engineer" out the gold plating and either distribute the savings to the alliance partners or deliver additional outputs
  - It should be noted that this issue already exists under the current arrangements
- Comparative regulation would be an important factor in helping the ORR to identify where this is happening and to adjust their assessment of the required funding accordingly
- Government / ORR could also introduce an element of competition for enhancement funds, whereby some of the funding is allocated between regions based on the relative VfM of their proposals. This would require some flexibility from government in terms of the specified outputs in each region (i.e. specified outputs would need to be adjusted to reflect the level of enhancement funding provided)
- Regulators in other industries have used a number of different techniques to address this issue including various types of information quality incentives

A further benefit of mandating enhancement alliances is that this would establish a piece of alliancing infrastructure in each region. This could act as a platform for the voluntary development of other alliancing initiatives

- The Enhancement Alliances would establish a piece of alliancing infrastructure in each region and would bring parties together to jointly work on the planning and delivery of enhancements
  - The Regional IM and all relevant train operators would participate in the alliance
  - It should not be viewed as a mere “talking shop” because it would be responsible for a material enhancements budget
- As we highlighted in the Alliancing Best Practice section, alliances and partnerships evolve over time as parties get used to working together. The Enhancements Alliances could therefore act as a catalyst for the development of a range of voluntary joint working activities
  - Facilitates relationship and trust building
  - Could act as a structural platform – provides legal and governance infrastructure
- Regions which are covered by a VI entity should still have Enhancement Alliance. This would help to ensure that secondary train operators are involved in the enhancements planning process



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  - JV option development
  - JV option evaluation
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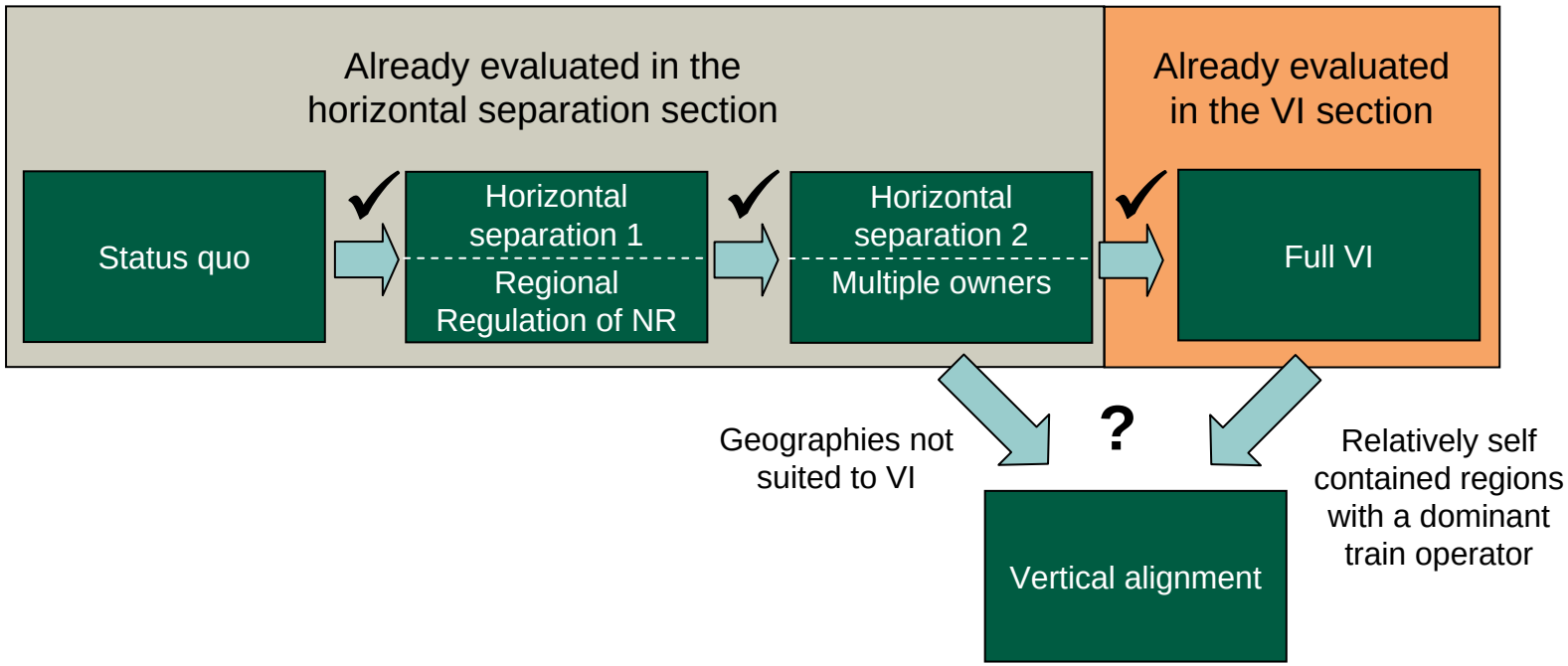
L.E.K. has evaluated the Vertical Alignment JV options relative to both Full VI and Horizontal Separation with multiple owners (recognising that not all geographies are suited to Full VI). The evaluation has again been carried out using the Anglia region as an example

Road map for evaluating vertical alignment



Potential scope of Vertical Alignment JV

- Signalling operations, management of control centres and mobile operations managers, performance management
- Maintenance and renewal of all other fixed infrastructure
- Most enhancements to fixed infrastructure

Vertical Alignment can be thought of as a halfway house between HS with multiple owners and Full VI – at least insofar as it shares many of the advantages and disadvantages of Full VI but with the impact of each item being moderated

Potential advantages and disadvantages of Full VI relative to HS with multiple owners – with ticks and crosses indicating whether these also apply to VA

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

Disadvantages

(✓) Greater transition cost and risk

(✓) 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"

X
- Reduced intensity of initial bidding if some TOC owning groups do not want to bid for a VI concession

X
- Potential reduction in VfM as a result of applying regulation to TOC after 15 years rather than holding another competition for the market

X Potential negative impact from any reduction in the ideal length of a Regional IM concession

X = doesn't apply to VA (✓) = partially applies to VA ✓ = fully applies to VA

There are a number of other advantages and disadvantages of voluntary vertical alignment JVs relative to Full VI

Summary of advantages and disadvantages of voluntary vertical alignment JVs* vs Full VI

Advantages

- Less of a radical change to the current situation so could potentially cheaper, faster, less disruptive and less risky to implement [but see opposite]
- Could be implemented prior to end of current franchises if done on a willing buyer basis so benefits could flow sooner
  - However, there may be some legal issues associated with creating JVs mid-franchise
- Could potentially be implemented in a wider range of geographies
  - However, difficulty of implementation is likely to increase as the number of operators increases
- Would not necessarily require a move away from DfT's standard franchise length

Disadvantages

- Higher interface costs during term of concession because under most scenarios a vertical contractual interface would still exist
- Incentives still not fully aligned in most scenarios so whole-system optimisation harder to achieve
- The "small numbers problem" could make it difficult for the Regional IMs and TOCs to reach an agreement on the structure and terms of a JV

Note: * L.E.K. has excluded mandatory JVs from the option evaluation for the reasons given earlier (except for enhancement alliances)

Vertical Alignment cost – benefit analysis (1 of 2): Vertical Alignment JVs would deliver less benefit than Full VI

Indicative benefits of Full VI and Vertical Alignment JVs in the Anglia region

	Advantages		30 year NPV* (£m)		Comments
			Full VI vs HS	Vertical Alignment vs HS	INDICATIVE
1	Reduced interface management costs		30 - 129	15 - 65	• Impact highly dependent on scope of JV structures that TOCs and infrastructure manager might be prepared to consider • Indicative assumption that the maximum benefits of VA JVs are 50% of those of Full VI
2	Give overall operational control to train operators		89	45	• Indicative assumption that the maximum benefits of VA JVs are 50% of those of Full VI
3	Align incentives and facilitate market driven whole-system optimisation	Asset management	39 - 195	19 - 97	• Indicative assumption that the maximum benefits of VA JVs are 50% of those of Full VI
		Enhancements	45 - 90	22 - 45	• Indicative assumption that the maximum benefits of VA JVs are 50% of those of Full VI
	Total		203 - 503	101 - 252	

Note: *NPV in 2010/11 pounds assumes full VI from 2014/15 for a 30 year concession, discounted using a real 3.5% discount rate

Vertical Alignment cost – benefit analysis (2 of 2): However, Vertical Alignment JVs would also have lower costs than Full VI

Indicative costs of Full VI and Vertical Alignment JVs in the Anglia region

	Disadvantages	30 year NPV* (£m)		Comments
		Full VI vs HS	Vertical Alignment vs HS	INDICATIVE
4	Greater transition cost and risk	Small	Small	• Relatively small under both scenarios
5	Mixing together different types of business	Small	None	• Risk of impact reduced for Vertical Alignment JVs relative to Full VI
6	Potential negative impact on "competition in the market"	Small (providing that the necessary safeguards are implemented and enforced)	None	• No impact for Vertical Alignment JVs
7	Reduced intensity of bidding	None	None	• Does not apply for Vertical Alignment JVs
8a	Compromise to Regional IM concession length	Evidence from HS1 suggests limited upfront	None	• Does not apply for Vertical Alignment JVs
8b	Compromise to franchise length	(151) - 0	None	• Does not apply for Vertical Alignment JVs
	Total	(151) 0	Small	

Note: *NPV in 2010/11 pounds assumes full VI from 2014/15 for a 30 year concession, discounted using a real 3.5% discount rate

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

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This section contains the executive summary of L.E.K.'s 25 February 2011 report on Cost and Revenue Sharing mechanisms. This work was jointly commissioned by ORR, ATOC and NR

Paragraph 1 of ORR's Invitation to Tender

"The sharing of cost and revenue outperformance and underperformance (against a baseline trajectory) between Network Rail and train operators at a local/route level is a potentially fundamental element of rail industry reform

It provides for better alignment of incentives and encourages closer working between Network Rail and train operators, which should improve efficiency, value for money for customer/passenger and taxpayer, and other industry outcomes

There is a broad acceptance of the conceptual benefits of 'sharing' but more work is required to examine the practical implementation and operational issues"

L.E.K.'s evaluation summary included 4 options for sharing cost and revenue performance relative to a baseline trajectory

Options for sharing cost and revenue performance relative to a baseline trajectory

Options		Description
1	Regional EBS (symmetrical)	L.E.K. has assumed the following changes to the existing PR08 EBS for the purposes of the evaluation summary - Separate EBS calculations are performed for each of NR's (modified) Operating Routes - The DfT does not apply any 'no net loss, no net gain' mechanisms to any EBS payments - Covers both underperformance and outperformance (i.e. it is symmetrical) - Includes mechanisms to limit the risk exposure of TOCs (i.e. caps and the exclusion of a few specific causes of variances) - Applies to new franchises only, via the franchise letting process L.E.K. has assumed that the EBS would continue to be carried out on a cash expenditure basis rather than a revenue requirement basis
2	Regional EBS (upside only)	As above, but applying only to outperformance by each of NR's Operating Route
3	NR shares TOC revenue	NR takes a share of total TOC passenger revenue in exchange for a fixed reduction in FTAC
4	Full scope	Symmetrical Regional EBS as described above, plus NR shares in under/outperformance of TOC revenue and cost relative to a defined baseline

L.E.K. evaluated a further 4 options for changing incentives which do not (necessarily) involve the sharing of cost or revenue under/outperformance relative to a defined baseline. This results in a total of 8 options

Other options for changing incentives evaluated by L.E.K.

Category	Options		Description
Partial exposure to ORR's periodic review determinations	5	Delta FTAC	Changes in FTAC at periodic reviews no longer a full pass-through via Clause 18.1 (or similar provisions) but operators would still have some level of protection. This could incentivise train operators to engage more actively during periodic reviews, e.g. by critically reviewing NR's business plan to ensure that all planned expenditure is justified
	6	Delta OMR baseline	Similar to the "Delta FTAC" option but instead based on the ORR's assessment of the efficient OMR expenditure for the next control period – i.e. this still relates to changes in an ORR determined baseline between control periods. This does not relate to actual NR expenditure relative to the baseline (that is Option 1)
Regulated transaction charges	7	Higher VTAC rates	Increasing the variable usage charge could provide an incentive for NR to accommodate additional trains as its incremental revenue could exceed its incremental cost – although this would depend on a number of factors including whether enhancements would be required
Non-prescriptive	8	Bespoke, line-of-sight deals	Bespoke commercial deals made between NR and train operators, typically (but not necessarily) in situations where specific, tangible opportunities have been identified. These deals could take many forms, which may or may not involve a cost and revenue sharing mechanism This option assumes that funders and the ORR adopt a much more flexible approach in how they deal with train operators and NR

L.E.K. has taken into account 13 different criteria in its evaluation of the 8 options

Category	Criterion	Key question / test
A. Stakeholder support	A1. Primary operators	Did the scheme have support (in workshops and consultation) from operators who are potentially primary operators in a route/region? (Would they be a willing participant?)
	A2. Secondary operators	Did the scheme have support from operators who would expect to be secondary operators?
	A3. NR	Did the scheme have support from NR?
B. Effective incentive	B4. Scope	Does the scheme cover a substantial part of the revenue and cost within the industry? Will the incentive apply in a wide range of situations?
	B5. Alignment of incentives	Does the incentive align the interests of all parties in a way that drives improvements in VfM? Does it avoid creating any perverse incentives?
	B6. Avoidance of gaming	Does the scheme avoid creating opportunities for gaming?
C. Simplicity	C7. Simplicity	Is the scheme easy enough to communicate that the incentive can be understood and internalised throughout all relevant organisations – including people responsible for making day-to-day decisions that impact other organisations?
D. Focus	D8. Controllability	Does the scheme only cover cost, revenue and risk items that parties are able to control, or at least influence?
	D9. Directness	How direct is the link between action and outcome? (For example, are the benefits certain and near term?)
	D10. Free-riders	Does the scheme prevent any party benefiting from it without having participated in improving VfM?
E. Scheme costs	E11. Scheme costs	Will costs of the scheme (e.g., negotiation, monitoring and settlement) be reasonable? To include counterparties, other operators and wider industry costs (e.g. ORR/funders)
F. Implementation	F12. Implementation cost	Can the scheme be implemented without excessive costs?
	F13. Implementation speed	Can the scheme be implemented across a substantial part of the network quickly?

L.E.K. has drawn on a number of different sources in its evaluation of the 8 options and has used a 5 point scoring system to help summarise the results of the evaluation process

- L.E.K. has drawn on a number of different sources in its evaluation of the 8 options, including:
  - L.E.K.'s alliancing best practice review
  - Analysis of whole industry financials and regional train operations data
  - Stakeholder engagement through individual interviews, five workshops and a review of stakeholder submissions to the McNulty review
  - ORR's PR08 determination and supporting documents
  - Review of reports prepared for the earlier phases of the McNulty review
  - L.E.K.'s prior experience in the industry
  - L.E.K.'s assessment of the rational response by participants
- L.E.K. has used a 5 point scoring system to help summarise the results of its evaluation of how well each of the 8 options performs in terms of each of the 13 evaluation criteria
- The resulting summary provides a high level picture of the strengths and weaknesses of each option but cannot capture all of the subtleties associated with each option. For example:
  - There are a range of sub-options within each option. L.E.K. has only shown the results for the most attractive version of each option
  - Some of the weaknesses of individual options can be addressed by combining two or more options together
  - The relative attractiveness of each option varies by geographical region. For example, whether there is a single dominant operator or a mix of many different operators with no operator being dominant
  - The assessment may change over time as the industry evolves. For example, devolution of NR could improve train operator support for some of the options
- Because the evaluation involves assessing future behaviours and outcomes, some judgement is required
- The main body of our report contains a more detailed assessment of how each option could work in practice

Options 3, 7 and 8 appear to be the most attractive in the short term. However, Options 3 and 7 are focussed on the same objective

High level summary of option evaluation – for implementation in the short term

Criteria	Sharing of cost and revenue out/underperformance vs baseline				Other options for changing incentives			
	1: Regional EBS (sym)	2: Regional EBS (upside)	3: NR shares TOC revenue	4: Full scope	5: Delta FTAC	6: Delta OMR baseline	7: Higher VTAC rates	8: Bespoke L-of-S
A1. Primary operators	--	0	+	--	-	-	0	++
A2. Secondary operators	--	0	0	--	-	-	-	+
A3. NR	+	-	+	+	+	+	0	++
B4. Scope	+	-	+	++	+	+	--	0
B5. Alignment of incentives	+	+	+	++	0	0	+	+
B6. Avoidance of gaming	+	+	++	--	++	++	++	+
C7. Simplicity	0	0	++	--	+	+	++	+
D8. Controllability	--	--	-	--	--	-	++	++
D9. Directness	--	--	++	--	-	-	++	++
D10. Free-riders	-	-	++	-	--	--	++	+
E11. Scheme costs	0	-	++	-	+	+	++	0
F12. Implementation cost	+	+	++	0	++	++	++	+
F13. Implementation speed	--	--	0	--	+	+	+	+

This table is a high level summary of the option evaluation process. Individual scores should be treated as indicative and may vary across regions, over time or depending on the package of options

Achieving better alignment of incentives should be viewed as a journey. It is important that the industry makes the first steps on that journey imminently in order to set expectations for industry participants

- There is broad agreement that rail industry VfM would benefit from better alignment of incentives between NR and operators. However, our assessment suggests that a number of the options considered in this project have significant weaknesses that would be hard to overcome
- This should be viewed in the context of comparing the options against true alignment of incentives that would be achieved in a vertically integrated railway. The options may still have significant merit when compared with the existing system in which there is very poor alignment of incentives
- Achieving full or even good alignment may require several steps of reform and involve cultural change in order to lead to behavioural change
- A key enabler of such cultural change is taking a first, public, step towards better alignment of incentives
  - this would send a signal to industry participants about the direction of travel
- We therefore recommend a “bias towards action”, i.e., that the industry takes at least some imminent steps to improve alignment of incentives

Summary of recommendations

Option	Implement?	Comments
1: Regional EBS (symmetrical)	?	L.E.K. has concerns that a Regional EBS 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 Given the uncertainty over whether a Regional EBS would deliver VfM for taxpayers, in might be best to include it as a priced option during franchise bids rather than as the base case 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 **All of the above points are discussed further in this section**
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. It would be far better to start with a much more limited form of partnership working and then to gradually deepen the arrangements when both parties are comfortable to do so
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. As with Options 1 and 2, horizontal separation of NR would significantly improve train operators' ability to influence NR's costs 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. This option should not generally be implemented but there might be a few franchises where Option 3 cannot be implemented within a reasonable timeframe where Option 7 could be considered
8: Bespoke line of-sight deals	✓	**Implementation requirements discussed further in this section**

Horizontal separation of NR is an essential enabler of all cost and revenue sharing options as discussed on the next slide

Horizontal separation of Network Rail is an essential enabler of all of the cost and revenue sharing options* (1 of 2)

- During L.E.K.'s workshops, train operators were generally not supportive of any cost and revenue sharing mechanisms which gave them exposure to NR's costs
- The one exception to this was Option 8, bespoke line-of-sight deals, where train operators were able to take on exposure to a tailored package of NR's costs and risks on a willing buyer basis – i.e. they would be structuring the deal in a way that gives them sufficient control, or at least influence, over the costs and risks
- Train operators put forward a number of reasons for why they were not comfortable taking on a broader exposure to NR's costs and risks through a prescriptive regional cost and revenue sharing framework
  - TOCs were not confident that robust financial information was currently available at a regional level. This would hamper their ability to identify opportunities and make decisions on a whole system, whole life optimisation basis. It would also expose them to changes in NR's cost allocation policies
  - NR's highly centralised management approach would hamper TOCs' ability to work with NR's regional managers to innovate and implement changes locally
  - Some TOCs even questioned whether NR responds to financial incentives in the same way as a normal commercial organisation given its position as a single monopoly supplier and its CLG ownership and governance structure

Note: * Except higher VTAC rates which simply involves changing a transaction charge

Horizontal separation of Network Rail is an essential enabler of all of the cost and revenue sharing options* (2 of 2)

- Horizontal separation should go some way towards overcoming train operators' concerns
  - Gives train operators much better information on their, and other, Regional Infrastructure Managers (Regional IMs). This greatly strengthens train operators' ability to help deliver cost savings through a number of mechanisms, including external challenge of the Regional IMs
  - Gives more accountability and decision making authority to the regional managers with which train operators have the closest working relationships
  - Introduces indirect competition between Regional IMs through comparative regulation. This, together with the publication of a range of KPIs (financial and non-financial) on their performance, greatly strengthens their incentives to seek continuous improvement
- There are a range of options for horizontal separation which span from devolution within NR ownership to multiple owners of the Regional IMs (with NR potentially retaining ownership of several of the Regional IMs)
- Any move towards horizontal separation would help to address some of the downsides associated with prescriptive regional cost and revenue sharing mechanisms. However, experience from other regulated sectors has shown that having multiple owners of the Regional IMs improves comparative regulation and strengthens the incentives on Regional IMs to seek continuous improvement. As such, horizontal separation with multiple owners would be the strongest enabler of cost and revenue sharing mechanisms
- Horizontal separation could be implemented through a phased approach between now and the end of CP5
  - NR devolution implemented in CP4 (NR has already announced its intention to implement devolution)
  - ORR regional regulation from the start of CP5
  - Three or four Regional IMs become independently owned during CP5

Note: * Except higher VTAC rates which simply involves changing a transaction charge

Horizontal separation of NR would improve the attractiveness of Option 1, Symmetrical Regional EBS, but some significant issues would remain

Criteria	1: Regional EBS (sym)		Comments
	Now	After implementing HS with multiple owners	
A1. Primary operators	--	-	TOCs would probably still prefer not to be given broad exposure to a Regional IM's costs. But HS would go some way to addressing their concerns
A2. Secondary operators	--	--	No significant change: Secondary operators would still have limited influence over outcomes and freight operators would have limited ability to take the downside exposure
A3. NR	+	+?	Unclear. Currently strong support from NR head office but more mixed reaction from regional managers
B4. Scope	+	+	No change
B5. Alignment of incentives	+	+	No change
B6. Avoidance of gaming	+	+	No change
C7. Simplicity	0	0	No change
D8. Controllability	--	0	There would be greater scope for TOCs to work with Regional IMs to innovate and implement changes locally. It would remain the case that TOCs can only influence a significant proportion of the Regional IM's cost base through external challenge, but they would have significantly better information with which to do this
D9. Directness	--	--	No change. Although performing separate calculations for each region is a significant improvement on the current national EBS mechanism, still no direct link between specific actions and outcomes. Payments based on the ORR's annual assessment of the Regional IM's overall regional efficiency
D10. Free-riders	-	-	No change. Regional IM out/underperformance will result from a wide range of factors and each operators' contribution will be aggregated within the overall outcome. Significant risk of train operators making a token effort to drive VfM improvements in order to qualify for a share of the benefits that have been generated by other companies
E11. Scheme costs	0	0	No change. Could impose fairly significant costs on TOCs as they would need to have significant engagement with NR's cost base and ORR's regulation of NR
F12. Implementation cost	+	+	Relatively limited if horizontal separation occurs anyway. Assume that scheme would not be implemented mid-franchise - incumbent TOCs would probably charge a large risk premium for mid-franchise implementation
F13. Implementation speed	--	--	No change: Probably only applies to new franchises due to cost of implementation as a mid-franchise change. Furthermore, could only be implemented from start of CP5

L.E.K. has concerns that a Regional EBS 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

- In L.E.K.'s opinion, many of the concerns raised by train operators regarding a prescriptive cost sharing mechanism are valid. These concerns include the limited ability of TOCs to influence NR's costs under NR's current, highly centralised management approach. As such, L.E.K. has concerns that a Regional EBS would not deliver VfM in the short term – irrespective of whether it is symmetrical or outperformance-only
- Horizontal separation of NR would improve the attractiveness of Options 1 and 2, so if a Regional EBS mechanism were to be implemented then it should follow a phased approach which is aligned with horizontal separation of NR:
  - Include in new franchises from the point that government announces horizontal separation. This would improve the likelihood of achieving VfM through the franchise letting process as train operators would have greater confidence that their current concerns would be addressed
  - Could become active from the start of CP5 but with a low starting sharing percentage (e.g. 12.5%). This would enable all parties to get used to the mechanism in a relatively low risk environment (half way between a "wooden dollars" introduction and a big-bang introduction). It also reflects the fact that there could be quite a high level of uncertainty over the CP5 regional efficient expenditure determinations
  - Full sharing percentage of 25% applies from the start of CP6 when both horizontal separation and the EBS mechanism have had a chance to bed down
- If an EBS mechanism were implemented then it could create a perverse incentive whereby TOCs would try to persuade ORR to set soft targets for the Regional IMs during periodic reviews. To overcome this, any EBS mechanism should be combined with a mechanism that gives TOCs a partial exposure to ORR's periodic review determinations (i.e. Option 5 or 6)

Given the uncertainty over whether a Regional EBS would deliver VfM for taxpayers, in might be best to include it as a priced option during franchise bids rather than as the base case

- Even if a phased approach were used to implement a Regional EBS mechanism, significant uncertainty remains over whether such a mechanism would deliver VfM for taxpayers
- Overall VfM would depend on a number of factors including how train operators price a Regional EBS mechanism into their franchise bids. Bidders would have to take a number of factors into account including:
  - The Regional IM's likely cost and revenue performance relative to the regulatory target in the absence of train operators' input (i.e. the average outturn vs target)
  - The range of uncertainty around the outturn vs target (i.e. the variability of outcomes)
  - The extent to which train operators are able to influence NR's costs
- Franchise bidding has been very competitive in recent years and this could indicate that taxpayers would secure VfM through a Regional EBS mechanism being implemented through a bidding process. However, there is significant uncertainty regarding all of the factors listed above and that, combined with train operators negative reaction to cost sharing mechanisms during L.E.K.'s workshops, could lead to conservative pricing in this area
- A Regional EBS could be included as a priced option in franchise bids rather than the base case. This would have the advantage of providing transparency of train operators' views of the cost and benefits of the mechanism, thereby facilitating an assessment of VfM. However, bidders have limited capacity to price options during the bidding process so funders need to be careful in the prioritisation of options

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

- There are two significant disadvantages of an outperformance-only Regional EBS mechanism relative to a symmetrical mechanism
  - First, if train operators believe that the Regional IM is going to under-perform their baseline then they may simply ignore the EBS mechanism because there would be no reward for contributing to efficiency improvements
  - Second, it becomes more difficult to value the EBS mechanism because the value becomes more sensitive to the variability of the Regional IM's performance versus baseline. This concept is described in more detail later but in essence, the train operators would benefit from this underlying variability because they receive a share of any outperformance but do not have to make any payments in the event of underperformance. This phenomenon is often referred to as "option value"
- The existence of the option value would make it more difficult to secure VfM through implementing an outperformance-only Regional EBS during existing franchises. Train operators would be unlikely to agree to pay for the option value (or at least to pay for its full value) so there would be a negative VfM impact unless the train operators made a large enough contribution to Regional IM efficiency improvements to offset this
- It is uncertain how train operators would price the option value if an outperformance-only Regional EBS mechanism were introduced through a franchise bidding competition. However, L.E.K. thinks it likely that bidders would price this conservatively due to the uncertainty over the level of variability and train operators lack of control over this item
- The main advantage of an outperformance-only EBS mechanism over a symmetrical mechanism is that bidders would not have to charge a risk premium to protect themselves against the potential downside risk. However, it should be noted that the EBS mechanism could include caps and tapered sharing percentages to limit the downside exposure to train operators and therefore limit the risk premium charged by TOCs
- In summary, the relative attractiveness of an outperformance-only EBS mechanism and a symmetrical mechanism depends on how train operators price these two mechanisms, and this is uncertain. If both mechanisms were priced competitively based on good information then the symmetrical EBS mechanism would be the more attractive because TOCs would be less likely to ignore the mechanism. However, the uncertainty over the pricing of this mechanism should not be underestimated

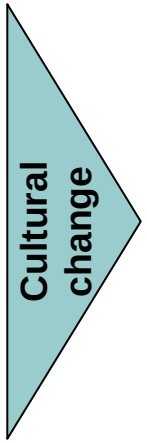
L.E.K. recommends that funders / ORR promote Option 8, bespoke line-of-sight deals. However, a cultural change is required in order for these to make a significant contribution to improving rail industry VfM

Centralised, contract based approach

Interactions between different rail industry participants are currently managed using a very contractual approach

Whilst a range of contractual and regulatory protections are absolutely necessary, the inflexible way in which these are currently applied stifles innovation and the adoption of new ways of working. It also discourages industry participants from challenging the status quo, which leads to specifications and standards becoming ossified

This problem is compounded by NR's highly centralised management approach



Devolved, relationship based approach

Many other industries which require close cooperation across the supply chain have moved to more relationship based management approaches

These management approaches were initially pioneered in Japan but have subsequently been embraced across Western Europe and North America. Some European railways have started to adopt these approaches, e.g. Denmark

Relationship based approaches provide much greater flexibility to implement the right solution for each situation and to evolve over time as circumstances change and innovations occur. Contractual and regulatory protections will still be required, it is a question of how they are applied

Devolved decision making is an absolutely critical enabler of relationship based management approaches

Funders and the ORR would need to do a number of things to facilitate these deals

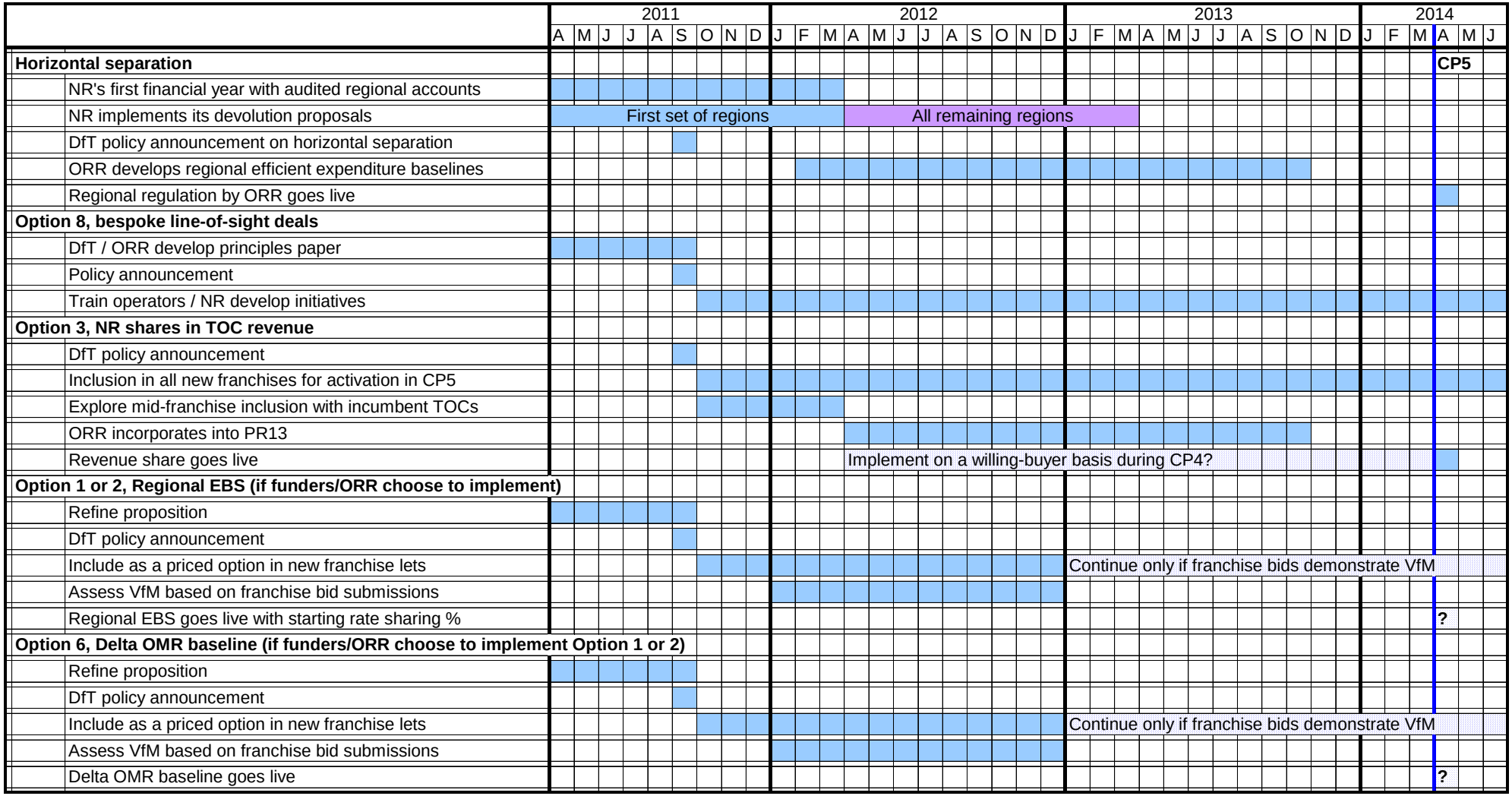
Funders / ORR actions to facilitate bespoke, line-of-sight deals

- Clear statement from the leadership of the DfT, other funders and ORR encouraging a move towards more devolved, relationship based management approaches and the development of bespoke line-of-sight deals
- Publication of a principles paper that describes funders / ORRs new, more flexible approach to managing the various contractual and regulatory arrangements. This would include details of:
  - The types of areas and circumstances where funders / ORR will be more flexible, and the likely degree of flexibility in these areas. This would include details of materiality thresholds to help identify where a “light touch” approach is appropriate
  - Key principles for ensuring that third parties are no worse off as a result of a deal. This would include principles for determining funders share of any savings which have been facilitated by a relaxation of an output specification. It would also include details of the minimum requirements for involving third parties in decisions that could impact them (this could be a light touch version of existing industry arrangements)
  - the delegated authority of funders / ORR staff who will have the closest relationships with NR and train operators
- Ensure that funders / ORR have the right number of people, in the right positions, with the right skills to:
  - Use the delegated authorities to effectively manage the various contractual and regulatory arrangements in line with the new more flexible management approach
  - Help overcome specific roadblocks and other barriers to implementing change
- Publically celebrate any bespoke line-of-sight deals that improve VfM
  - This would help to create momentum across the industry. Once a few deals have been successfully completed, TOC and NR managers in other regions are likely to feel the pressure to implement similar deals

Option 8 is a carrot-based option not a stick-based option. Allowing train operators and NR to develop their own approach to bespoke line-of-sight deals would maximise the scope for innovation

- A number of stakeholders have expressed the view that some form of target or obligation would be required in order to push TOCs and NR into making bespoke, line-of-sight deals, otherwise nothing will happen. However, the whole point of these deals is that they are carried out on a willing buyer basis. These deals should be initiated by train operators or NR because they perceive an opportunity to achieve mutual benefit by working together. The role of funders and the ORR is to create the right environment for these opportunities to be worth pursuing. As highlighted earlier, this includes:
  - Horizontal separation of NR
  - A more flexible approach to managing regulation and contracts
  - Allowing train operators and NR to achieve commercial gain from the deals (i.e. Option 8 is a carrot-based option not a stick-based option)
- Allowing each region to develop its own approach to bespoke line-of-sight deals would maximise the scope for innovation, and would allow regional managers to take account of both the specific circumstances of each region and the preferred approach / experience / skills of the local managers. L.E.K.'s alliancing best practice review highlighted that each alliance is unique and develops over time
- Experience from other industries shows that successful partnerships often start with relatively simple contractual arrangements and then evolve through to increased dependency. Therefore, it is quite likely that in some of the regions the partnerships would evolve into formal joint ventures or comprehensive cost and revenue sharing mechanisms. However, the critical point is that the end state and transition arrangements would not have been mandated. Instead, they would have been achieved through steady development of the following:
  - Individual and corporate relationships and trust, together with the necessary alliancing skills
  - A commercial model which each party is comfortable with - including the allocation of accountabilities, responsibilities and risks
  - Supporting systems and business processes
  - Senior management commitment

Indicative timeline for Cost and Revenue Sharing implementation programme

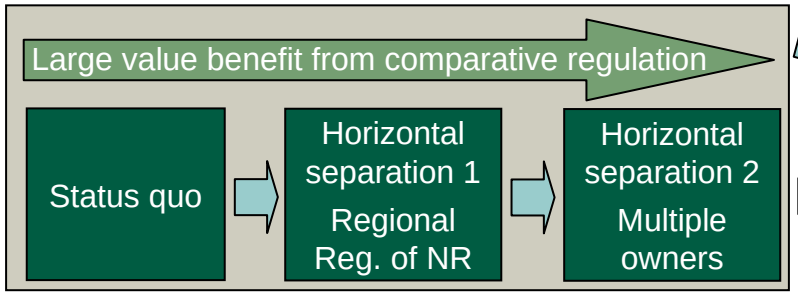


This programme assumes full cooperation from NR

Agenda

- Executive summary
- Introduction
- Horizontal separation
- Vertical integration
- Vertical alignment
- Cost and revenue sharing
- Implementation
- Appendix

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

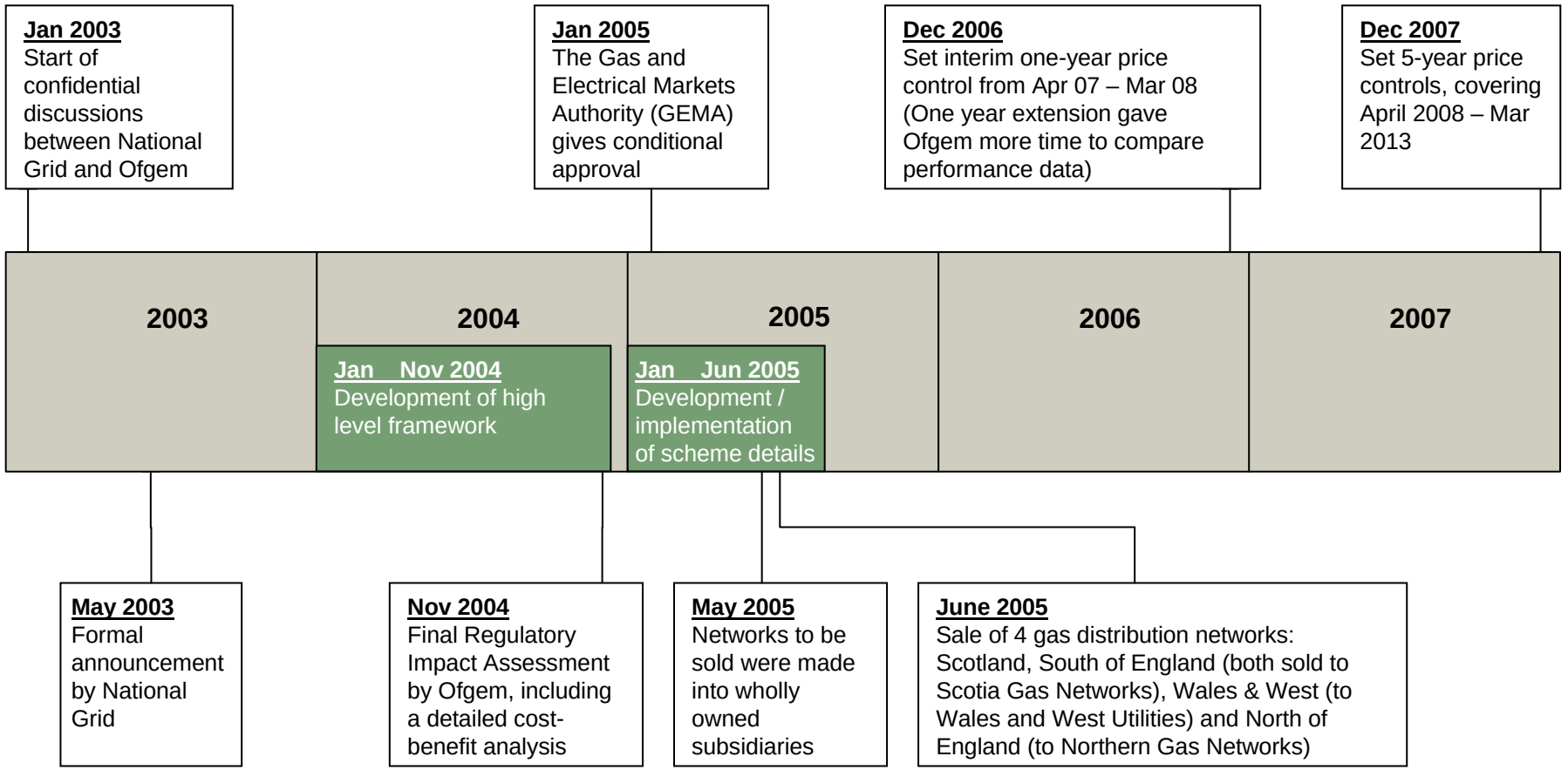
- Cost and revenue sharing has significant merits in principle. A package should be rolled out including partial schemes in new franchises and encouraging bespoke, line-of-sight deals
- They could use the Enhancements Alliances as a platform for implementation

L.E.K. has developed a Gantt chart containing an indicative timeline for the implementation programme

Summary of logic and evidence used to develop the indicative timeline

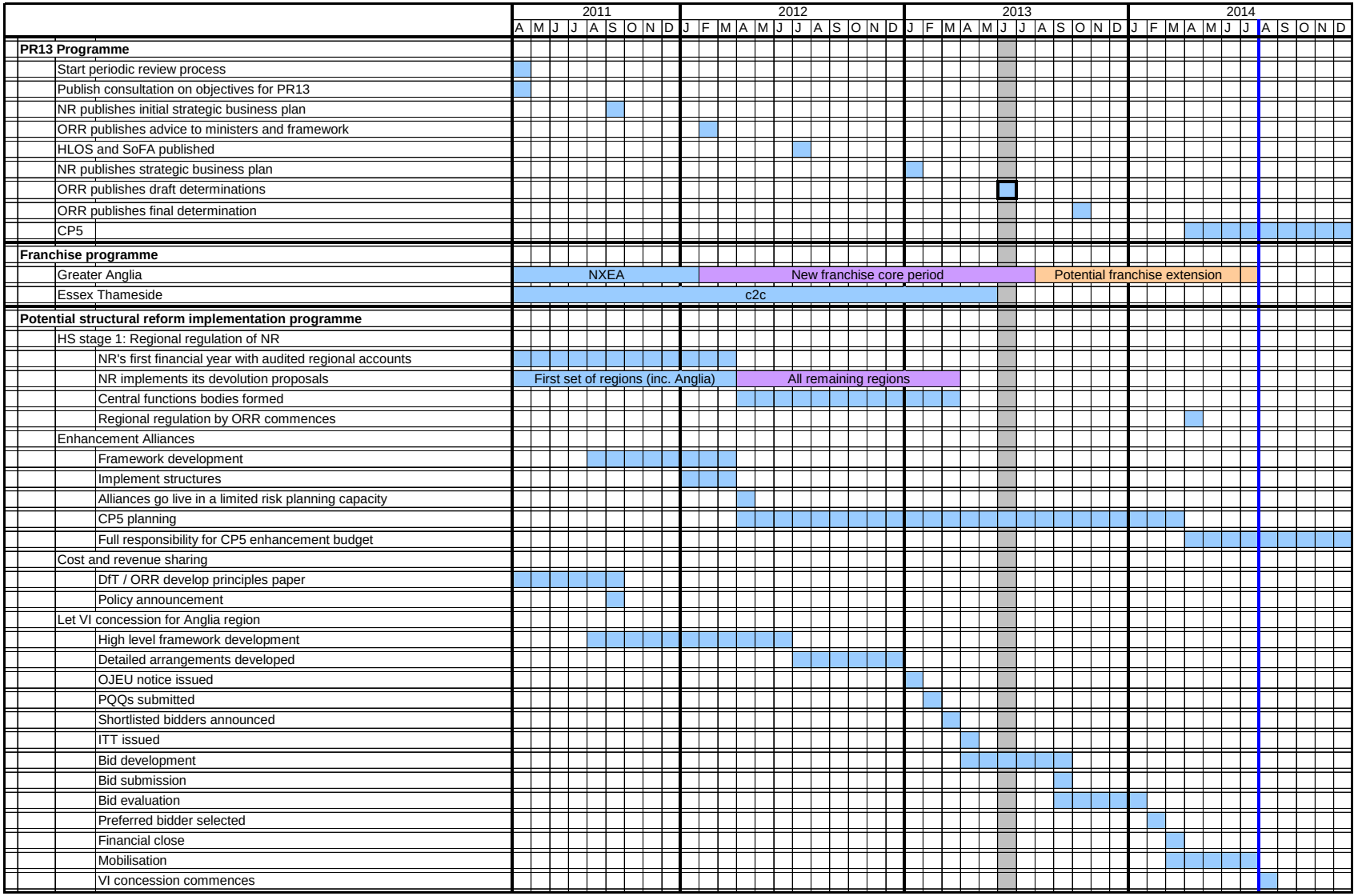
- ORR's published programme for PR13 and an assumption that the PR18 programme is the same as this but shifted out by 5 years
- End dates of franchises for major operators in relatively self contained parts of the rail network, including extension options where relevant
- Time required for VI concession bidding process informed by:
  - Timeline for National Grid's sale of four regional gas distribution networks
  - InterCity West Coast rail franchise bid programme (programme for letting a VI concession would need to be longer than this)
- The Anglia VI concession bidding programme has been coordinated with the PR13 process and franchise end dates such that:
  - DfT publishes the OJEU notice for the VI concession at the same time as NR publishes its Strategic Business Plan
  - ORR publishes its draft determination for CP5 three months before VI bids are submitted
  - The VI concession start date is aligned with the end of the optional extension period for the short Anglia franchise that the DfT is in the process of letting
- The programme assumes full cooperation by NR

It took National Grid Gas 2.5 years to split out and sell four regional gas distribution networks. Ofgem set long term prices based on the new benchmarking data a further 2.5 years after the sale



Source: Ofgem, NAO

Indicative timeline for implementation programme



This programme assumes full cooperation from NR

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