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11

Procurement and delivery structures for HSR

11.1 Introduction

This chapter presents the preferred delivery model for the procurement, construction and operation of a future HSR program. This model establishes the most appropriate structural model for the delivery of HSR services and the preferred procurement options for the delivery of the HSR system.

The chapter is structured into three sections, covering:

- The assessment of alternative structural options.
- The preferred procurement options.
- A comparison of the preferred delivery model for HSR in Australia with the various international examples of HSR.

11.2 Preferred delivery model for a future HSR system

Given the large amount of public funding required, it is important that the governance and institutional structures support the likely public interest objectives of a future Australian HSR program.

The central aim must be for HSR to deliver an effective and affordable transport service to customers. Other objectives would likely include ensuring that transport markets are efficient, and that transport systems are integrated and networked and contribute to regional and urban development.

There is a range of options for structuring the delivery of the preferred HSR system to achieve these objectives. Options include¹:

- The separation of infrastructure components of the preferred HSR system from the transport services supply, in terms of ownership and/or management (described as ‘vertical separation’).
- The separation of components of the preferred HSR system on either a geographic or product basis (described as ‘horizontal separation’).

Competition issues, including the role of contestability in the provision of HSR services, either through competition for concession rights or direct competition between service suppliers, are central to deciding the most effective delivery options. These are discussed in the following section.

11.2.1 Competition and contestability issues

Intermodal competition (or the threat of competition) from air and car travel would generally act as a strong binding constraint on HSR fare and service levels across most core HSR market segments. As a consequence, there is unlikely to be a requirement for economic regulation of HSR services, i.e. the control of HSR price and service levels, to constrain the potential for the HSR operator to exercise any monopoly power.

Even with strong competition from other modes, there may be additional efficiency benefits achieved by encouraging competitive pressures in the supply of HSR services. The naturally high barriers to entry for a new HSR operator wishing to compete with an incumbent HSR operator suggest that consideration has to be given to how to ensure ongoing supply-side competition in the delivery of HSR services in Australia.

Head-to-head competition between HSR lines in Australia is unlikely to be commercially or economically justified within any reasonable

timeframe, given that one integrated HSR system would provide all of the capacity Australia requires for the foreseeable future.

An open access regime to facilitate multiple HSR operators competing for the same markets on the same rail system is probably not practical, given the already great challenge of encouraging a train operating company to commit to creating a sustainable transport business in a greenfield market. It is probably also unnecessary because of the competitive pressure from other transport modes already mentioned. Therefore, vertical separation of train control and infrastructure maintenance from train operations would not be necessary to facilitate non-discriminatory access of competing train operators.

Competition for the market, i.e. competition for the right to provide certain services on an exclusive basis for a defined period, would be the most effective means of encouraging competitive pressures in the supply of HSR services and in meeting governments’ objectives for the HSR program. A concession model is typically the mechanism used to deliver competition for the market.

Where the services are commercially viable, the successful bidder would pay governments for the right to operate the concession; where they are not, governments would need to pay the successful bidder to operate the concession. The concession agreement ensures that train services that use publicly financed infrastructure deliver public interest objectives (such as minimum service levels) while having sufficient commercial freedom and agility to compete successfully with the other transport modes. There is a range of possible concession models, with the variations related to the responsibilities of, and degree of risk passed to, the concession holder. Further discussion of train operations concessions is provided in **section 11.3.3**.

1 Vertical separation in this context refers to the separation of a rail organisation by function (e.g. operations and infrastructure). Horizontal separation refers to the separation of a rail organisation by geography (e.g. by state or region), by line of business (e.g. urban operations from regional operations) or by product (e.g. inter-capital from suburban services).

Although governments would likely own the HSR system because of the large public financial contribution required, a broad range of options exists for how the delivery of HSR services could be structured. These options are outlined below.

11.2.2 Vertical separation options

The various vertical (or functional) separation options would vary the scope of public and private sector participation in the development and operation of the preferred HSR system. The scope of potential roles is as follows:

- Acquire and own land – in all cases it is assumed that an entity owned by the Australian Government and possibly the ACT and relevant state governments would acquire and own the land to support the preferred HSR system.
- Design and build the HSR system – constructing the track, structures, signalling and electrical infrastructure.
- Maintain the HSR system – maintaining the track, structures, signalling and electrical infrastructure.
- Operate the HSR system – controlling the movement of trains through the system.
- Operate train services – the delivery of train services in a particular market or markets.
- Supply trains – the supply of rolling stock, which may also include finance and/or maintenance of the equipment.

Some of these roles may be bundled together to facilitate optimal packaging and procurement outcomes, which are discussed further in **section 11.3**.

In terms of public/private sector participation, there are three broad options for developing and operating the HSR system – public, private or a combination of public and private sectors. Within each broad option, there are various sub-options, as

outlined in **Figure 11-1**. The list of sub-options in **Figure 11-1** is not exhaustive but covers the main combinations observed in the market today.

Public HSR delivery options

Under the vertically integrated public HSR option (1a), a publicly owned HSR corporation would be created to develop, build and operate the preferred HSR system. The corporation may be owned jointly by the relevant state and territory governments and the Australian Government². The HSR corporation would acquire land, build the HSR system and procure rolling stock utilising traditional public sector procurement approaches. The corporation would also operate and maintain the HSR system and operate train services. Components of construction and maintenance could be outsourced to private sector contractors, but the public sector enterprise would manage and operate the train services.

Alternative vertically separated options could be contemplated which would create public agencies to deliver different components of the system, and which would allow a greater degree of focus and specialisation. Option 1b contemplates an HSR development authority (HSRDA) to construct the preferred HSR system, a separate HSR system manager to operate and maintain the system, and one or more HSR train operating companies to operate the train services.

The ‘pure’ public HSR options perform relatively poorly in terms of likely competitiveness and potential for innovation. Although intermodal competition would exert competitive pressure on publicly owned train operators, lack of competition on the supply side may lead to a less efficient and less customer focused outcome than alternative structural options allowing contestability of train operations. This conclusion is supported by general experience in transport operations in Australia and by international experience. Historically, Australia’s publicly owned railways have been characterised by relatively low productivity, high

² A relevant historical example is the National Rail Corporation which was created to operate interstate rail freight services and was initially jointly owned by the Australian, NSW and Victorian Governments.

Figure 11-1 HSR vertical separation options

HSR Delivery Models	Acquire & own land	Design & build the HSR network	Maintain the HSR network	Operate the HSR network	Operate train services	Supply trains
1. PUBLIC HSR						
1a. Vertically integrated	HSR Corporation					
1b. Vertically separated	HSR Development Authority	HSR Network Manager (ARTC equivalent)		HSR Train Operating Company(ies)		
2. PRIVATE HSR						
2a. Vertically integrated	HSRDMA*	HSR 'Design Build Operate Maintain' concession(s)				
2b. Vertically separated (dual concessions)	HSRDMA*	HSR 'Design Build Operate Maintain' concession	HSR 'Operations' concession(s)			
3. PUBLIC-PRIVATE HSR						
3a. Public operator-maintainer	HSR Corporation					HSR fleet supplier
3b. Public infrastructure manager	HSR Infrastructure Corporation				HSR 'Operations' concession(s)	
3c. Public landlord-maintainer	HSR Infrastructure Corporation			HSR 'Operations' concession(s)		
3d. Public landlord	HSR Delivery Authority	HSR 'Operate/Maintain' concession(s)				

*HSR Development and Management Authority

costs and poor service quality³. Freight railways have been progressively separated and privatised. Passenger railways still in public ownership in Australia are bureaucratic, inefficient and currently undergoing major reforms and there is likely to be little public appetite to establish a new public sector train operator⁴.

Although there would be an option to commence operation with a public operator and privatise once the HSR system matured, as has been the case for HSR train operations in some countries such as Japan, there would seem to be little need for such an approach. This option would forego the benefit of leveraging private sector expertise, experience and incentive structures to tackle competitive private sector airlines in the early phase of HSR operations. Concession arrangements for private sector operators could be structured to manage risks in the start-up phase, particularly the market risks, and there would be no compelling need to commence operations with a public operator. Therefore, a pure public delivery model (option 1) is not desirable and was not considered further.

Private HSR delivery options

Under the vertically integrated private HSR option (2a), a private concession (or concessions) would be established to design, build, operate and maintain the preferred HSR system. Private finance could also be utilised but would depend on, among other things, how the public financial contributions were structured. It has been assumed that a publicly owned HSRDMA would need to be established to procure the land necessary to support the development of the preferred HSR system.

As with the public HSR delivery options, alternative vertically separated options could be contemplated that would allow different organisations to deliver different components of the system. Option 2b contemplates an

HSR concession to design, build and maintain (DBM) the HSR system. One or more additional operations concessions would be established to operate the system (i.e. controlling the movement of trains through the network) and the service (i.e. delivering train services). A variation to this model would see the DBM contractor also operate the system (i.e. control the movement of trains), which may have some merit if there are multiple operations concessions over the system.

The purely private HSR options transfer construction, maintenance, operations and investment risks to the private sector. The operating railway is handed back to governments at the end of the concession period(s). A number of factors make this type of contract problematic in the case of an HSR program on the east coast of Australia:

- It would not be feasible to privately finance the full infrastructure investment, given the inability of train operations to provide a commercial return on infrastructure costs.
- The sheer size and complexity of a future HSR program would preclude most prime contractors (both domestic and international) from carrying the infrastructure delivery risk on their balance sheet.
- Substantial public funding would be required, necessitating governments' responsibility to ensure the HSR program meets public interest aims through oversight and stewardship.
- Wider public interests include a need to integrate the preferred HSR system with state transport systems and state infrastructure.

Therefore, a purely private HSR delivery model (option 2) is not appropriate and was not considered further.

³ Productivity Commission, *Progress on Rail Reform*, Inquiry Report, April 2000.

Williams, Greig and Wallis, *The Results of Railway privatisation in Australia and New Zealand*, Transport Papers, World Bank, 2005.

⁴ RailCorp, the passenger operator in NSW, is currently undergoing major reform. In May 2012, the NSW Government announced major reforms to tackle middle management inefficiency and bureaucracy – see *Sydney Morning Herald* 19 May 2012. Queensland Rail, the passenger operator in Queensland, also recently announced the commencement of reforms with a proposal to reduce corporate and support areas by 500 personnel (see Media Statement, the Minister for Transport and Main Roads, Hon Scott Emerson, Tuesday, 11 September 2012).

Public-private HSR delivery options

A range of hybrid options contemplate different roles for the public and private sectors. Option 3a is similar to the integrated public HSR option, except that the fleet is supplied through a private third party rolling stock supplier, similar to PPP fleet arrangements that presently exist in some Australian urban railways.

Options 3b to 3d respectively provide an expanded role for the private sector. Option 3b contemplates a publicly owned HSR infrastructure corporation that would build, operate and maintain the HSR system. However, a private concession, or concessions, would be established to operate the HSR train services. Option 3c is similar to Option 3b but with the operations of the system (i.e. the control of the movement of trains) undertaken by the private sector train operator. Option 3d still has the publicly owned HSRDA responsible for building the preferred HSR system, but the private sector train operator would be responsible for both control of the movement of trains and maintenance of the system infrastructure.

The most promising vertical options for the delivery of the preferred HSR system provide for public delivery of the HSR infrastructure with transport services provided by private companies. Even with public delivery of the infrastructure, letting a single turnkey contract may not be feasible. Some unbundling of the infrastructure into multiple contracts would be required. Other variations include the extent to which system operations (i.e. the movement of trains), infrastructure maintenance and rolling stock supply are bundled with the operator(s) of train services or with alternative suppliers.

A detailed assessment of the packaging and procurement options would be required before a preferred delivery model could be finalised, as discussed in **section 11.3**.

11.2.3 Horizontal separation options

In addition to vertical (functional) separation of components of the HSR system, a range of horizontal separation options may also be contemplated, typically either by geography or product (service). In the context of an Australian HSR system, the most promising options for geographic separation relate to sectors which cover the major market pairs:

- A north concession (Brisbane–Sydney).
- A south concession (Sydney–Canberra–Melbourne).

Given public delivery of the HSR infrastructure network, the horizontal separation options are concerned with the delivery of train operations and other functions. Separate train service operators in the north and in the south could each operate on their respective systems as vertically integrated operations (i.e. with each operating train services, controlling the movement of trains on their systems, and possibly also maintaining their systems). In such circumstances there would be a need for a joint operations area (such as Central station in Sydney) with common use access areas. For the HSR system services (i.e. train control), it would be possible to separate into north and south operations with a co-located area at Central station in Sydney.

Although providing for separation of north and south concessions would add some operational complexity and cost, for instance by having to establish multiple control centres or possibly a joint facility, it would be feasible. Given the recommended staging is that Sydney–Melbourne should precede Brisbane–Sydney, this option would permit a separate competition to be run for the north concession.

Options also exist to segment concessions by product or service type. This study has identified three types of potential HSR product that would exist on both the north (Brisbane–Sydney) and south (Sydney–Canberra–Melbourne) lines:

- Inter-capital express services.
- Inter-capital regional services.
- Commuter services.

These services could be further segmented into north and south concessions. Separate market or product concessions would allow greater market focus and access to specialist skills and services. For example, an airline company might be a strong candidate for a concession that aligned HSR regional services with its air operations, whereas commuter HSR operations might be more attractive to an urban rail operator. As with geographic separation options, the additional benefits of multiple concessions would need to be weighed against the potential loss of synergies between operations and the additional cost and complexity (e.g. multiple control responsibilities, duplication of facilities, having to share station facilities).

In the context of the preferred HSR system, separation of commuter services from inter-capital express and regional services would seem most merited. There are strong operational and marketing synergies between the inter-capital express and regional services in either of the north or the south segments, though less synergy between the two segments themselves. By contrast, commuter services would have different characteristics and different economics to the inter-capital express and regional services, requiring different rolling stock and likely requiring ongoing state government financial support. It might therefore be desirable to structure a commuter concession in a different way from an inter-capital express/regional concession (e.g. involving train operations only with a shorter concession term).

Where the vertical delivery options provide for system operations to be undertaken by a train operations concession, with multiple product-based train operations concessions (that is, separate commuter and inter-capital express/regional operators), the inter-capital express/regional operator should control the movement of trains on the system. This arrangement reflects this operator's wider span of operations and dominant role.

The commuter operators would be given access under an access agreement with the inter-capital express/regional operator.

As was the case with the vertical separation options, a detailed assessment of the packaging and procurement options would be required before a preferred delivery model could be finalised, as discussed in **section 11.3**.

11.3 Procurement and packaging strategy of the preferred HSR system

The procurement strategy for the preferred HSR system would need to take into account its staged implementation and ensure that the HSR program could be procured cost effectively and efficiently to deliver the best value for money. Critical questions are:

- What package of assets and services should be procured in any single contract?
- What procurement model is most suitable for delivery?

11.3.1 Procurement considerations

As indicated in **section 11.2.2**, a private financing solution for the procurement of the preferred HSR system would not be feasible, due to the high capital costs, the absence of sufficient commercial return to recover capital costs, and the significant construction, delivery and demand risks.

With respect to the procurement of infrastructure assets for the preferred HSR system (broadly comprising tunnels, bridges, earthworks and permanent way), the size and scale of the works for any of the stages envisaged as a whole would be outside the delivery capacity of major industry participants, both locally and globally. 'Delivery capacity' relates to the ability to:

- Carry the risk of delivery on a balance sheet.
- Access appropriate levels of parent company financial support.
- Carry sufficient insurance.
- Secure the depth and availability of skilled personnel and other relevant resources.

Delivery of the infrastructure works as a single, integrated package is therefore unlikely to generate sufficient market appetite to generate effective competition among contractors. The infrastructure assets package would therefore need to be further split to create sub-packages that would be attractive to the market.

Contractors in the Australian market have demonstrated a capacity to deliver projects of \$1-2 billion. This package size has therefore been adopted for analysing the procurement options for the preferred HSR system, although it is acknowledged that at the time of procurement the market may have the capacity to deliver larger packages, likely in consortia with international contractors. A judgement would need to be made at the time of going to market.

In addition to infrastructure assets, there are a number of other core network components including signalling systems, stations, rolling stock and asset maintenance. Some components of the HSR system, such as signalling and safe working systems and rolling stock, would require specialised technological expertise and products. Only a few global companies supply the advanced signalling systems and/or rolling stock suitable for HSR. This would suggest that, where feasible, these components should be packaged and procured in a separate competition, rather than form an element of a larger civil engineering tender, where the ability to create competition between bidding consortia would be constrained by the limited number of these specialist technology suppliers.

11.3.2 Core works packages

Construction of the preferred HSR system would be undertaken in stages, with the core components in each stage procured through the following works packages:

- Infrastructure asset packages (broadly comprising tunnels, bridges, earthworks and permanent way) would be split and procured in a number of sub-packages of a size and scope that is attractive to the market and which would facilitate strong competitive bidding, generally through design and construct (D&C) contracts.
- Signalling systems and rolling stock would be delivered as a combined design, supply and maintain (DSM) contract, then leased from the HSRDMA to the concession operator.
- Stations and maintenance would be delivered as a set of PPP contracts, combined where possible, but likely to be separated at major city stations.

Infrastructure assets

As the size of the infrastructure asset procurement (estimated at a risk-adjusted cost of approximately \$20 billion (in \$2012) for the Sydney-Canberra stage alone) is too large to be delivered as a single integrated package, it would need to be split and procured in a number of sub-packages. **Appendix 7A** provides a summary of the proposed infrastructure assets sub-packaging solution for Sydney-Canberra, which comprises 11 infrastructure sub-packages (including three tunnelling packages).

The preferred approach would be for the infrastructure assets sub-packages to be delivered as individual D&C contracts. The rationale for this approach is as follows:

- As the scope of works and risks for each sub-package are expected to be definable and well understood, fixed price models (i.e. D&C) and competitive tensions should deliver best value. Given the relatively high number of sub-packages, the HSRDA would need to impose a high degree of both technical and performance specification in the D&C contracts to ensure consistent and interoperable standards between sub-packages.
- Key risks relating to land acquisition, planning and environmental approvals would be retained by governments in all procurement options. Other risks (such as constructability) are expected to be well understood and able to be assessed by contractors. As such, risk can be effectively transferred to the party best able to manage that risk, which supports the use of a D&C model.
- International and domestic market interest is likely to be significant for each sub-package, which should create competitive tensions and

enable governments to drive value for money through the tender process. A D&C model is well understood by the contractor market.

- A D&C model involves a shorter and less complex procurement process relative to the other procurement options, such as design, build and maintain (DBM), given the more limited scope (e.g. excluding infrastructure maintenance and operations) and more limited risk transfer (e.g. construction risks only).

Procuring multiple sub-packages of works would create significant and complex interface risks between contracts. For instance, there are interfaces between the individual 'geographic' works packages, between infrastructure works and technology systems, and between stations contracts. These risks would inevitably be retained by governments irrespective of the delivery model for each sub-package.

To mitigate this risk, governments, through the HSRDA, would need to retain a strong technical capability to effectively specify interface standards and oversee delivery of the D&C contracts. Under this model, governments are effectively taking on the role of systems integrator and would need to second, or contract, world class systems integration expertise to manage the interface risks in the contracting strategy. Procuring a future HSR program using proven technology and contemporary international standards and protocols of the time would also help to mitigate this risk.

Signalling systems and rolling stock

Modern train control and signalling systems rely heavily on digital communications and in-cab equipment, compared with historical systems, which relied almost exclusively on track-side infrastructure. The Australian Rail Track Corporation (ARTC) is currently implementing a communications-based signalling and safe-working system across its national rail freight network. Interfaces between the train control and signalling systems, the communications systems and the rolling stock are considered one of the biggest system integration risks in the procurement of the preferred HSR system.

By packaging the signalling systems and rolling stock together, this key risk (including rolling stock commissioning and acceptance risk) is likely to be substantially, if not entirely, transferred to the private contractor. There would also be significant commissioning efficiencies, given the train control and signalling systems and rolling stock would be developed in conjunction with each other.

Reflecting the unique nature of the signalling works and rolling stock package, the preferred procurement option is a DSM contract, as opposed to a design and supply (D&S) contract. The rationale for this approach is that:

- Linking supply and maintenance for a significant part of the rolling stock's life encourages a whole-of-life approach by the contractor. A DSM model would likely drive the best value for money outcome, since contractors would be inherently incentivised to reflect the maintainability of the system in its design.
- The signalling systems and rolling stock components are likely to offer significant opportunities for contractor involvement in terms of market innovation in all aspects of the respective technical solutions. Delivery models that access innovation from multiple parties through a competitive process should deliver the most innovation. A DSM model would achieve this outcome.
- The choice of signalling system would need to ensure it does not constrain flexibility and/or competitive tension for future signalling procurements in subsequent stages of the HSR program. One approach would be for the HSRDA to specify a signalling performance requirement based on open architecture systems, such as European Train Control System Level 2. This would facilitate interoperability with hardware from other suppliers utilising the same protocols, thereby ensuring multiple suppliers could bid for signalling systems procurements for later HSR program stages.

The HSRDMA would procure the train control and rolling stock assets, with the rolling stock being subject to a finance lease arrangement to fund the supply component of the DSM contract. The HSRDMA would lease the train control system and novate the rolling stock finance lease and maintenance arrangements (under the DSM contract) to the train operations concessionaire.

Stations

Greenfield stations

The optimal approach would be for the greenfield stations to be delivered as multiple PPPs. The PPP model would be structured to include responsibility for designing, building (including station fit-out), financing and maintaining (but not operating) the station over a period of 20 to 25 years. The PPP model would likely be based on a form of access charge. The rationale for a PPP approach is:

- The stations package, including maintenance, offers one of the few opportunities to capture private finance for the HSR program. Experience indicates that there is market appetite for PPP stations in Australia (e.g. Southern Cross station in Victoria).
- A PPP model would deliver enhanced value for money through the private contractor and financier driving optimum on-time and quality performance, and through synergies created by bundling the relevant design, construction and maintenance services.

There should be benefits from procuring and constructing the non-CBD greenfield stations for the initial stage of construction as part of a single PPP contract, given they are likely to have a common risk profile (specific civil works), synergistic benefits (such as reduced preliminaries and overheads) and potentially reduced interface risks (with one contractor responsible for all stage stations). Greenfield stations within a stage (e.g. Sydney South and Southern Highlands stations in the Sydney-Canberra stage) would be packaged together and procured using a PPP model. Revenue to fund procurement would come from station access charges paid by the train operating concessionaire and other possible cash flows such as car parking. There might

be benefits in further splitting the greenfield stations into individual sub-packages, as it could facilitate increased competition and open up the development opportunity to smaller construction firms. This decision can be made by the HSRDA at the procurement stage based on contemporary market conditions.

CBD stations

With respect to the CBD stations, such as Central station in Sydney, a broader set of considerations would come into play, including the redevelopment of existing stations and connectivity with existing transport systems, links to broader station precinct development and the broader operational and development objectives of the state and ACT governments. The CBD brownfield station redevelopments would be separately packaged and procured as an alliance, D&C or DCM contract, subject to the technical, interface and risk attributes of the works, particularly the interface with Central station and associated train operations.

Property and commercial development opportunities may exist above and around stations. This revenue would be maximised by implementing a 'precinct planning' approach to new stations that focuses on maximising land development and uses at each station and integration of stations within those precincts.

Inclusion of property development with the stations package needs to be assessed on a case-by-case basis. On the one hand, property and commercial development could be best pursued separately from the PPPs, based on the following:

- The skills required to undertake property development activities differ from those required to design, construct and commission large rail transport infrastructure projects.
- The financing requirements and bankability of returns differ between infrastructure projects and property development projects.
- Separation of a PPP, which is integral to the operation of the HSR, from commercial development encourages the complete focus of the PPP contractor.

However, there is a countervailing view that including the property development opportunities with the station works package would allow for better assimilation of the station and the development around it, particularly where the development is integral to the operation of the station. In addition, inclusion of skilled property specialists in the design and construction of the stations can ensure that the value of the property development opportunities is maximised.

At this stage, the option for including property development opportunities should be left open. The viability and optimal form of a PPP solution for the greenfield HSR stations should be subject to a robust value for money assessment by the HSRDA at the time of going to market.

11.3.3 Train operations concessions

Train operations concessions would be offered to the market and would combine:

- The operation of train services, including the operation of stations.
- Control of the movement of trains.
- Maintenance of the infrastructure assets.

Maintenance of the rolling stock, signalling equipment and control centres would be the responsibility of a separate DSM contractor. Although the DSM contract would be held by the HSRDA, it would be structured to facilitate delivery of the contractor's maintenance obligations in collaboration with the train operations concessionaire.

Governments should preserve the option, but not assume the obligation, to award separate concessions for combined inter-capital express/regional operations north and south of Sydney, with the potential for a company to bid for both concessions.

Allocation of track capacity between inter-capital express/regional concession holders and commuter operations would be the responsibility of the HSRDMA. Track capacity for commuter services would be negotiated by the HSRDMA with each

state and territory, and the inter-capital express/regional HSR concession holder would provide access to the HSR network (i.e. would provide agreed train paths) for the commuter operator as set out in its concession agreement.

The rationale for the proposed approach is:

- An effectively structured concession should facilitate a value for money transfer of ongoing operational, maintenance and commercial risks to the operator. In addition, a concession arrangement has the advantage of a shorter fixed term (of around ten to 15 years) compared to alternative privatisation models, which would permit governments to more frequently test the market and capture the benefits of competition between potential contractors.
- It is unlikely that the concession holder would assume the full revenue risk associated with HSR operations until the system is proven. There may, however, be concessionaire interest in a mechanism to share a degree of revenue risk where competitive tension for the concession contract drives it. Given revenue risk offers governments the best opportunity to incentivise appropriate operator behaviours, including in respect of improved customer service, a concession structured to share a degree of revenue risk would be preferred.
- Procuring the infrastructure assets and maintenance and train control services as part of the train operating concession would materially reduce interface complexities as it creates a single point of accountability for day-to-day operation of the preferred HSR system, even if the operator subcontracts components of maintenance to specialist maintenance companies.
- Creating institutional structures that would allow for separate concessions north and south of Sydney provides the option of effective competition for services provision on the later north stages of a future HSR program. Separating commuter concessions allows specific arrangements to be established with state and territory governments for their delivery, without compromising the delivery of competitive commercial inter-capital express/

regional HSR services. Allowing operators to bid for multiple concessions allows the market to determine the optimal number of operators on the HSR network.

The proposed train operations concessions would be structured on a 'net cost' basis. That is, the operator would take both revenue and cost risk and would bid for the concession on the basis of the net cost (after forecast revenue is deducted from forecast costs). In the early stages of the preferred HSR system delivery, it would be necessary for the revenue risk to be primarily underwritten by government, given its greenfield nature, but with incentives for the operator to build demand, innovate and deliver high quality services. Governments may choose to set maximum fares for specific fare types (such as economy class) and minimum service levels to ensure their substantial investment in HSR delivers the intended public benefits.

The concession agreement would be structured so that commercial revenues from the HSR operators would cover their train operating costs, the network operations and infrastructure maintenance costs, and make a contribution to capital costs. The rolling stock would be procured through the DSM contract and leased by the HSRDMA to the concession holder on a commercial basis. Commercial revenues from the concessions would not be able to fund the full costs of the infrastructure capital, but an access charge would be imposed, similar to the model that applies in Japan. The concession arrangements would need to strike a balance between providing profit incentives to the concession holders and maximising the financial recovery of the public investment in infrastructure.

11.4 Comparison with international models for HSR

Across the globe, there is no single, well established governance and institutional model for HSR. Differences in constitutional, industry and market structures prevent the simple translation of approaches from other jurisdictions to Australia.

The preferred HSR system identified in this study has been developed specifically for the east coast of Australia, based on Australian circumstances and parameters. However, given the similar policy dimensions and economic challenges of HSR in Australia and other countries, it is not unexpected that many of the features of the preferred HSR system are also found in countries where HSR has been adopted. This section compares the governance and institutional model for the HSR program in Australia with the institutional models for operating HSR services in other countries (see **Table 11-1**). Further details of international case studies are presented in **Appendix 7A**.

In all the overseas examples presented, the government owns the HSR infrastructure, having viewed HSR as public infrastructure of national importance and/or contributed substantially to its funding. In virtually all cases, the government has also retained an ongoing role in the stewardship of the sector. The study recommends the same approach be adopted by governments for the delivery of the preferred HSR system.

In most overseas cases, HSR infrastructure is administered on behalf of the government by a state-owned entity, although there are exceptions. In the United Kingdom and Netherlands, private managers hold the concessions, while in Japan, responsibility has been devolved to private train operating companies through a lease-style agreement. For Australia, it is proposed that the delivery and management of the system be undertaken by a government-owned HSRDA, which would evolve during the operational phase into a delivery and management authority (HSRDMA).

The seven European Union (EU) countries with HSR lines listed in **Table 11-1** are all obliged to provide third party access to trains that cross international boundaries of member states, in accordance with EU Railway Directives and single market principles. In practice, third party HSR train kilometres are currently a very minor proportion of the total in any country compared with the dominant HSR operator, except in Belgium, where the services of four member states' HSR companies (in some cases joint ventures of member states) converge in Brussels. Only Germany provides third party access to domestic HSR routes, but no private third party HSR operator has yet entered the market. Fast commuter-type services also use HSR lines in Germany (as part of the state-owned rail operator's product offering) and in the United Kingdom, on the HS1 track (operated by a commuter concession company).

The study proposes that Australian HSR concessions not adopt an EU-style access regime but instead concede exclusive rights to provide the defined service groups, though the structure would be consistent with some overlap at a few stations (such as Newcastle) between long-distance and commuter concessions.

To facilitate the open access arrangements, the EU countries operating HSR have separated infrastructure operations and maintenance from train operations by creating separate infrastructure companies.

In Germany, the network company is a subsidiary of the state-owned rail operator, but in most cases separate state-owned companies have been established. In France, the train control and maintenance of the network is contracted by the infrastructure company back to the dominant state-owned train operator. In France, the United Kingdom, Japan, China and Taiwan, the dominant train operating entity is responsible for train control and infrastructure maintenance either directly, under concession or under contract. For Australia, this would also be the preferred approach, realised through a concession structure that would include devolution of day-

to-day responsibility of both train control and infrastructure maintenance.

Although state-owned train operating companies dominate in most of the countries with HSR, all those countries had a dominant state-owned national rail passenger operator before the introduction of HSR. Given the competence and experience (and political power) of those existing companies, the assumption of responsibility for operating HSR fell naturally to them (or to subsidiary companies). In Australia, where no single substantial or dominant long-distance passenger rail transport supplier exists, the award of concessions to properly qualified private companies to operate trains is recommended.

The preferred model for Australia is perhaps closest, though not identical, to the Japanese model for new HSR lines. In Japan, a single state-owned entity, JRJT, is responsible for the development and strategic management of the HSR network, but operation of train services, control of the movement of trains and maintenance of lines is carried out by (mainly) private sector train operating companies serving particular high speed routes on an exclusive basis, for which they pay JRJT a fee to use the line.

For Australia, it is proposed that an HSRDA (which would evolve into an HSRDMA) be established to develop and manage the HSR network, but that the operation of train services, including control of the movement of trains and maintenance of lines, be concessioned to a private sector train operating company to serve a specific route on an exclusive basis. In Australia's case, the option to develop separate concessions north and south of Sydney should be preserved.

Table 11-1 Features of institutional frameworks for the preferred HSR system on the east coast of Australia and for international HSR systems

	Preferred Australian model	France	Germany	Great Britain (HS1)	Italy
HSR lines ownership	Public	Public	Public	Public	Public
HSR network administration	HRSDA (state-owned)	RFF (state-owned)	DB Netz (state-owned)	HS1 Ltd (private)	RFI (state-owned)
HSR network operations (train control function)	Contracted by HRSDA to dominant train operations concessionaire	Contracted by RFF to dominant train operations entity (SNCF)	DB Netz	Contracted by HS1 to national network operator (Network Rail)	RFI
HSR network maintenance	Contracted by HRSDA to dominant train operations concessionaire	Contracted by RFF to dominant train operations entity (SNCF)	DB Netz	Contracted by HS1 to national network operator (Network Rail)	RFI
Third party infrastructure access rights for HSR trains	No	For international trains of member states (EU law)	For international trains of member states (EU law)	For international trains of member states (EU law)	For international trains of member states (EU law)
HSR passenger train operations	Private concessions: <ul style="list-style-type: none"> • Inter-capital express south • Inter-capital express north • Commuter by state (3) 	Dominated by SNCF (state-owned) Plus a few international trains using track access rights	Dominated by DB Fernverkehr (state-owned) Plus a few international trains using track access rights	International HSR services operated by Eurostar (state-owned) Domestic fast services by Southeastern (private concession)	Trenitalia (state-owned) NTV (private open access operator)

Source: Compiled from multiple sources, including Beckers et al., *Long-Distance Passenger Rail Services in Europe: Market Access Models and Implications for Germany*, Discussion Paper No. 2009-22, OECD/ITF, December 2009.

	Belgium	Netherlands	Spain	Japan	China	Taiwan
HSR lines ownership	Public	Public	Public	Public (new HSR lines)	Public	Public
HSR network administration	Infrabel (state-owned)	Infraspeed (private)	Adif (state-owned)	JRTT (state-owned) leases lines to train operating companies to manage	Joint venture companies (typically majority-owned Ministry of Railways, plus provincial governments)	THSRC (initially private but now public following government take-over in 2009)
HSR network operations (train control function)	Infrabel	Infraspeed	Adif	Contracted to train operating company by lease agreement	Ministry of Railways (the national railway manager)	THSRC
HSR network maintenance	Infrabel	Infraspeed	Adif	Contracted to train operating company by lease agreement	Ministry of Railways	THSRC
Third party infrastructure access rights for HSR trains	For international trains of member states (EU law)	For international trains of member states (EU law)	For international trains of member states (EU law)	No	No	No
HSR passenger train operations	Several state-owned operators of international HSR trains Thalys Eurostar, Fyra, DB Inter-city Express (ICE), TGV	Two concessions: • NS Hi Speed (state owned) until 2015) • HAS (NS/ KLM joint-venture) until 2024	Renfe Operadora (state-owned)	Three private and one state-owned companies serving different routes/ regions	Ministry of Railways	THSRC • 35 year concession for train operations • Separate 50 year concession for station area redevelopment

Source: Compiled from multiple sources, including Beckers et al., *Long-Distance Passenger Rail Services in Europe: Market Access Models and Implications for Germany*, Discussion Paper No. 2009-22, OECD/ITF, December 2009.

11.5 Conclusion

The following key conclusions have been reached in regard to the preferred delivery model for a future HSR program:

- A publicly owned HSRDA would be established to develop and manage the HSR system, but the operation of train services, including control of the movement of trains and maintenance of lines, would be concessioned to the private sector to serve a specific route on an exclusive basis.
- The option to develop separate concessions north and south of Sydney should be preserved.
- Construction of the preferred HSR system by the HSRDA would be undertaken in stages, with the core system components in each stage procured through the following works packages:
 - Infrastructure asset packages (broadly comprising tunnels, bridges, earthworks and permanent way) would be split and procured in a number of sub-packages, of a size and scope that is attractive and manageable to the market and that would facilitate strong competitive bidding, generally through a number of D&C contracts.
 - Signalling systems and rolling stock would be delivered as a combined DSM contract, and then leased from the HSRDMA to the concession operator.
 - Stations and maintenance would be delivered as a set of PPP contracts, combined where possible, but likely to be separated at major city stations.