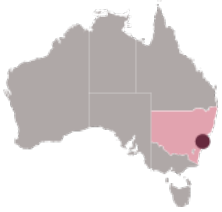
Australian Government | Infrastructure Australia

BUSINESS CASE EVALUATION REPORT

High Speed Rail Newcastle to Sydney



ASSESSMENT FRAMEWORK STAGE

1 DEFINING PROBLEMS AND OPPORTUNITIES | 2 IDENTIFYING AND ANALYSING OPTIONS | **3 DEVELOPING A BUSINESS CASE** | PROJECT DELIVERY | 4 POST COMPLETION REVIEW

LOCATION
Newcastle to Sydney, NSW

PURPOSE OF EVALUATION
Proposal seeking funding

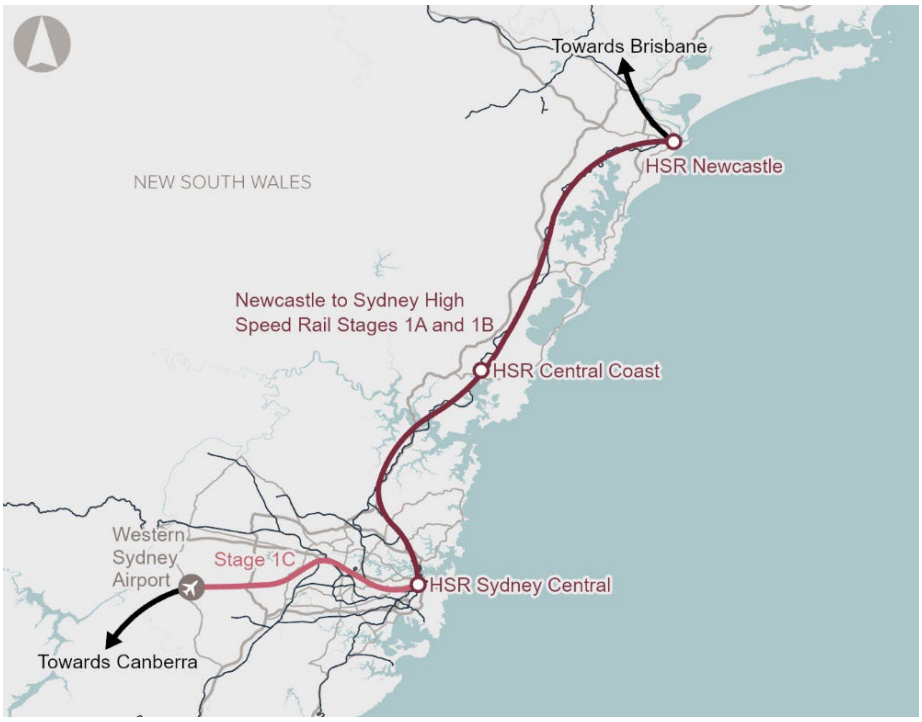
SECTOR
Transport

INVESTMENT THEME
High-Capacity Transport for Growing Cities

PROPONENT
High Speed Rail Authority (Australian Government)

INDICATIVE DELIVERY TIMEFRAME
Construction start: 2027
Completion by: 2042

EVALUATION DATE
23 July 2025



CAPITAL COST
Pending[1]

FUNDING COMMITTED/SOUGHT FOR DEVELOPMENT PHASE

Australian Government: $70 million approved

Australian Government: $667 million sought

Recommendations

Infrastructure Australia supports the full scope of the Development Phase[2] of the Newcastle to Sydney section of the National High Speed Rail (HSR) project, with focus on the following activities to improve certainty on costs and benefit realisation:

- Progressing as planned with Early Contractor Involvement (ECI) to increase design maturity to at least 40%, with consequential updates to the cost estimates in the economic and financial analysis to also include full network integration costs and precinct design.
- Completing further analysis on the housing objectives identified in the business case to:

[1] The capital cost is excluded to protect commercial sensitivities during future procurement processes. The capital cost, and any changes to funding from the Australian Government, will be updated once procurement is complete.

[2] The Development Phase includes 8 distinct tasks that will de-risk delivery and reduce uncertainty by undertaking further planning and design, conducting market sounding and progressing environmental approvals.

    - demonstrate the preferred option can achieve the housing estimates
    - identify actions needed by governments, such as through planning mechanisms
    - improve certainty that forecast housing can be delivered given labour and resource constraints.
- Investigating the funding strategy, including private sector financing and value capture.

In parallel, we recommend that further work and consultation progresses on the entire East-Coast National HSR project, leveraging and enhancing the analysis in the Product Definition Report that was developed alongside the business case. This should include the following to ensure there is a well-developed national strategic intent:

- reinforcing the sequencing of the Newcastle to Sydney section as the priority compared to all other sections (e.g. Melbourne to regional Victoria). HSRA has justified the Newcastle to Sydney section as the priority based on housing and employment benefits. This should be further justified alongside other key factors such as cost, constructability, travel-time savings, environmental impacts and lessons learnt.
- reviewing the impacts of HSR on travel patterns and travel modes (rail, road, air and freight) on a national level;
- demonstrating how the East-Coast National HSR will uplift Australia's sovereign capability such as in advanced manufacturing, jobs created and new economic activity and how it will be distributed across the entire corridor from Queensland to Victoria;
- detailing the design and constructability expectations for access to Melbourne, Canberra and Brisbane with particular emphases on tunnel lengths and associated lower train speeds impacting travel times;
- defining the role of the individual states and territories in delivery, including planning and other approvals, land use changes, property, expected funding and transport integration;
- further specifying project governance including HSRA, multiple Commonwealth agencies (e.g. transport, industry, housing, treasury, amongst others), the NSW government (and VIC, ACT, QLD), industry, local councils and other stakeholders.

We recommend the existing business case, including the economic appraisal, is updated to capture the outputs of the Development Phase and provided to the Australian Government, including Infrastructure Australia, to inform a final investment decision for delivery of the Newcastle to Sydney section. This should include a more detailed analysis of the change in greenhouse gas emissions and the cost of environmental approvals arising from the Newcastle to Sydney HSR project.

Evaluation summary

Infrastructure Australia evaluated the business case[3] for **High Speed Rail – Newcastle to Sydney** in accordance with our Statement of Expectations, which requires us to evaluate project proposals that are nationally significant or where Australian Government funding of more than $250 million is sought. HSRA completed the business case together with a Product Definition Report that provides high-level information on the National HSR project.

The proposed National HSR network would create a dedicated[4] HSR service along Australia's East Coast connecting Brisbane and Melbourne. The Australian Government has prioritised Newcastle to Sydney (HSR Stage 1) due to current and forecast population density, inter-regional travel movements and its potential to support economic and housing development. However, more detailed comparison of the Newcastle to Sydney section against other sections would help to justify why this section should be delivered first.

The preferred option in the business case is for HSR services between Newcastle and Western Sydney Airport, with initial delivery and operations from Newcastle to the Central Coast (Stage 1A) by 2037, to reach Sydney Central (Stage 1B) by 2039 and Western Sydney International Airport (Stage 1C) by 2042.

HSRA is seeking Australian Government funding to support a two-year Development Phase for Stages 1A and 1B. The proposed Development Phase would progress the design, secure planning approvals and corridor preservation, and is intended to support a more refined cost estimate and schedule to reduce uncertainty and risk before progressing to the Delivery Phase.

Infrastructure Australia considers that the business case presents an extensive analysis for the Newcastle to Sydney section, which supports targeted planning activities to address key uncertainties and support informed decision making.

Costs have been estimated by HSRA based on a point in time design reported by HSRA as being at 10% - 15% maturity. A higher level of cost certainty, typically with design at 20-40% maturity, is recommended to inform

[3] Submitted to Infrastructure Australia in December 2024.

[4] New high speed rail tracks and systems that are separate from existing rail networks.

decisions for delivery investment. Given the large amount of tunnelling and the new rail systems, we expect costs to vary considerably as design maturity improves. Until cost certainty is improved, it is currently not possible to make a confident assessment of the proposal's benefit-cost ratio (BCR).

Based on the submission materials, there is low confidence at this time that forecast housing benefits will be realised. The proposal's primary monetised benefit is land use change (58% of total benefits), with 46,000 additional households expected due to better accessibility. A further 52,000 to 104,000 households are expected as a result of a projected shift towards smaller household sizes (less people per household) from the population redistributing itself across a larger number of available dwellings. While there is evidence of a trend in declining household size in Australia, there is insufficient evidence to support this assumption.

Analysis completed by HSRA demonstrates that only under low cost and high benefit scenarios, and including land use benefits and wider economic benefits, would the benefits of Stage 1 (A, B and C) be expected to outweigh its costs. HSRA recommends adopting a 4% discount rate and found the BCR is between 0.8 to 1.0[5], with a net present value (NPV) of -$10.5 billion to $2.6 billion. However, using the upper bound capital costs estimates and lower bound estimates for housing supply, the BCR is 0.2 at a 4% discount rate or 0.1 at a 7% discount rate, demonstrating the need to improve certainty on costs and benefits.

Infrastructure Australia acknowledges that some benefits may be understated, including improved network resilience, improved business productivity, freight productivity on existing lines, and travel time savings. Travel time savings contribute around 6% of total benefits, which is lower than expected given the scale of connectivity improvements.

Approximately 60% of Stage 1 would be in tunnels that are mostly located between the Central Coast, Central Sydney and Western Sydney International, which results in train speeds of up to 200km/hr, that are almost 40% slower than the theoretical maximum. HSRA advised that higher travel speeds would require a significantly larger tunnel diameter and have minimal impact on end to end journey times over the Sydney to Newcastle distance and would not justify the additional infrastructure costs. Shorter tunnels located along the corridor between the Central Coast and Newcastle are designed for maximum line speed (320 km/h). We also note that Stage 1 only results in around 5% of switching from cars. These outcomes, together with the risk of realising housing uplift, challenge the objectives of the National HSR project, requiring further substantiation that the Newcastle to Sydney section should be delivered first.

HSR Stage 1 is estimated to generate 3.7 million tonnes of carbon dioxide equivalent (TCO2e) in emissions. HSRA proposes to adopt low carbon materials and initiatives to minimise and avoid construction emissions. The economic appraisal monetises the proposal's expected residual emissions of 1.3 million T.CO2e which does not align with IA's *Guide to assessing greenhouse gas emissions* or relevant state government requirements to monetise direct, indirect and embodied emissions. Including the impact of all emissions would be expected to materially reduce the BCR.

Approximately 7,500 direct construction-related jobs, across 25 occupations, are estimated to be required on an average annual basis over the 2026-38 period. The business case identifies significant workforce gaps from 2029 to 2036 across NSW, particularly in Heavy and Civil Engineering Construction, where demand for workers is expected to exceed supply by 35%. Capacity to deliver forecast housing has not been considered in the business case.

Infrastructure Australia recognises the substantial amount of work undertaken by HSRA in a very constrained timeframe. HSRA has also recognised the impact of the timeframe in delivering the business case and some material limitations of the analysis.

Infrastructure Australia is supportive of the full scope of the Development Phase of the Newcastle to Sydney HSR section, which should progress in parallel to further understanding the national economic and social impacts, benefits and risks associated with the entire National HSR project.

Proposal description

The National HSR network is proposed to be delivered in stages to meet the distinct needs of intercity and regional customers across the East Coast. The business case identifies the following sequence, although stages 2 and 3 will be subject to consultation and guidance from the Australian Government:

- Stage 1 connecting Newcastle and Sydney, including:
    - Newcastle to the Central Coast,
    - Central Coast to Sydney Central, and

[5] Assuming P90 and including WEBs.

    - Sydney Central to Western Sydney International Airport.
- Stage 2 connecting East Coast capitals and regional centres including:
    - Melbourne to Regional Victoria,
    - Canberra to Sydney, and
    - Brisbane to South East Queensland / Northern NSW.
- Stage 3 delivering the final connections to complete the East Coast network by connecting:
    - Regional Victoria to Canberra, and
    - Newcastle to South East Queensland / Northern NSW.

As the first stage of the network, the Newcastle to Sydney HSR proposal includes:

- six stations at Newcastle, Lake Macquarie, Central Coast, Sydney Central, Parramatta and Western Sydney International
- dedicated HSR alignment of 194 km in length, including 115 km of tunnelling, 41 km of surface track, and 38 km of bridges and viaducts
- maximum speeds of up to 320 kmph outside of tunnelled sections and up to 200 kmph within tunnelled sections
- integration with local and regional transport networks, station precincts and interchanges, parking, and dedicated stabling and trains facility on the Central Coast.

Further information on the proposal can be found at: https://www.hsra.gov.au/high-speed-rail

Evaluation themes

Strategic Fit	The case for action, contribution to the achievement of stated goals, and fit with the community.
Case for change	The business case presents a well-evidenced case for change in the Newcastle to Sydney corridor, including: • *Connectivity challenges:* as the busiest regional travel corridor in Australia, current transport options are slow, unreliable, congested and anticipated to worsen. The rail journey between Newcastle and Sydney takes about 2 hours and 40 minutes, 30 minutes slower than the equivalent drive. It was the most unreliable intercity corridor in the Greater Sydney area in 2024, with fewer than 79 per cent of trains meeting punctuality targets. • *Population growth and housing:* high and unevenly distributed population growth is expected for cities and regional Australia, with over 9.2 million people expected in the Newcastle to Sydney corridor by 2061. This combined with housing supply trending below demand puts further pressure on rent and housing prices, impacting affordability and delivery of the long-term housing pipeline. • *Lost opportunities for productivity, tourism and jobs:* the corridor contains the country's largest regional economy and is home to clean energy, advanced manufacturing and defence industries and without intervention they would maintain geographic disparities and limit growth. • *Contributing to net zero:* government policy requires a shift to more sustainable and resilient transport infrastructure to meet legislated net zero targets. The proposal identifies HSR as more environmentally sustainable and cost-effective than conventional rail, road or air solutions to address the identified problems and opportunities both in the Newcastle-Sydney corridor and nationally. However, the proposal will lead to a net increase in greenhouse gas emissions over the appraisal period, which indicates further work is needed to improve cost certainty and to identify opportunities to reduce emissions.
Strategic Alignment	A HSR network on the East Coast of Australia is a long-term commitment for the Australian Government, with HSRA established to oversee the planning, development and construction. The proposed Stage 1 solution seeks to align with Australian and state government commitments to increase housing supply, create jobs and provide sustainable transport options. The proposal aligns with the Infrastructure Policy Statement (2023) by addressing the strategic

	themes of Productivity and Resilience, Liveability, and Sustainability. The Australian Infrastructure Plan (2021) also directly references the opportunity for HSR investment to maximise economic, productivity and safety benefits. The proposal demonstrates alignment and contribution to a broad range of NSW policies and plans including the State Infrastructure Strategy 2022-2042, Future Transport Strategy 2056, Greater Sydney Region Plan, Hunter Regional Plan, Net Zero Plan Stage 1, and the Transport Oriented Development Program.
Network and system integration	The Stage 1 proposal has a well-developed strategy to integrate HSR with the NSW transport network and systems, including heavy rail, metro services in Sydney, light rail and bus networks, the M1 Motorway, coach services and active transport links. Transport feeder networks, precinct development, land use change and planning permissions are required to realise the proposal's benefits. The cost plan confirms that systems fit out, integration with operations control, essential above ground station operations and precinct / plaza allowances have been incorporated into the costs. The economic appraisal includes the cost of additional bus fleet and bus network operations that would be required to realise the benefits of HSR. At this stage, opportunities linked to network and systems integration within the corridor are adequately explored and considered in design. Proposed over station development, public transport feeder networks and road connections are currently included in the economic analysis. HSRA acknowledge that integration costs need to be further investigated to confirm the scope of network and system integration infrastructure. While these costs may be borne by different parties, they are part of the overall project delivery. However, integration can also drive broader network efficiency and long-term savings across the transport system. Recognising both costs and potential efficiencies will be important in assessing the overall impact on net benefits..
Solution justification	The options analysis was undertaken in four stages, progressively including greater detail on the approach and inputs. The analysis built on the 2013 High Speed Rail Study and NSW Government 2019 Fast Rail Sydney to Newcastle Strategic Business Case. The 2013 HSR Phase 2 Report recommended the Newcastle to Sydney connection should be timed after Sydney to Canberra, and Canberra to Melbourne sections. Further detailed comparison of the Newcastle to Sydney section against other sections would help to justify why this section should be delivered first. The business case identifies a preferred option of delivering a HSR alignment on dedicated track, delivered in stages from Newcastle to Sydney with stations at Broadmeadow, Lake Macquarie, Central Coast and Sydney Central; and subsequently providing the first connection toward Canberra from Sydney Central to Parramatta and Western Sydney International. Multi-criteria analysis found this option would provide the best value for money overall, generating benefits 55 per cent greater than the second ranked option (Newcastle to Sydney Central only), but its high costs place it only one percentage point ahead of the alignment stopping at Sydney Central. Based on this, the proponent proceeded to test the financial, economic and delivery impacts of a staged delivery for the Newcastle to Western Sydney International option.
Stakeholder endorsement	HSRA has so far conducted extensive communications and engagement across all levels of government, industry and peak groups, community and First Nations representatives. Stakeholder input was used to inform the options assessment. The business case reports that, overall, stakeholders expressed support for a HSR solution: • community groups highlighted benefits to the regions, housing opportunities, development opportunities and job creation; and concerns around financial feasibility, lack of action to date on planning, environmental impacts, and First Nations impacts • First Nations stakeholders highlighted the importance of building trust and collaboration. They expressed a need for a clear plan to grow capability of the First Nations workforce, and need to celebrate and integrate cultural narratives • local governments highlighted opportunities for connection and place making, alignment to strategic land use and regional plans. They also expressed interest in understanding the station locality analysis, enabling infrastructure requirements, and the solution • NSW Government highlighted opportunities for land use change and economic development,

	and how regional development opportunities would be unlocked • key stakeholders and peak bodies expressed support with a desire to understand the delivery strategy and industry participation. The proponent has outlined a detailed approach for future engagement with governments, non-government and community stakeholders throughout the proposal's lifecycle, with engagement in the Development Phase identified as a critical activity. We encourage HSRA to engage early with airline and motoring industry bodies to understand potential impacts of the broader National HSR network along the East Coast.
Societal Impact	**The social, economic and environmental value of the proposal, as demonstrated by evidence-based analysis.**
Quality of life	The business case presents substantial evidence to support the case for improved quality of life through the use of distributional analysis and social value assessment, indicating significant benefits for communities and local economies in the Newcastle to Sydney corridor. Improved social and wellbeing outcomes from improved access to housing, education and health services are expected to deliver $5.4 billion to $10.1 billion (PV, 2024-25$) in benefits. The proponent has monetised quality of life impacts, applying innovative valuation methods to estimate benefits related to: • living standards - addressing spatial inequity with social housing, education, jobs, and complementary initiatives for regional liveability • learning and development – increasing access to higher education for disadvantaged communities and a mechanism for skills development • culture - improving access to cultural destinations and commitment to minimising impacts on First Nations cultural values • economic and social participation - encouraging higher labour market participation by providing better access to jobs and reducing travel costs. In Infrastructure Australia's view, the methods used to estimate these benefits are appropriate. In most cases, the valuation methods are in early stages of development but have been used in jurisdictional assurance processes for project-specific use cases. The business case provides some limited qualitative evidence that these quality of life benefits have been realised in international jurisdictions. The proposal is also estimated to unlock 99,000 new jobs within the corridor and improve access to key economic centres for 134,000 Australians.
Productivity	The business case presents robust evidence that the proposal will provide productivity benefits using appropriate estimation methods. The proposal is forecast to improve productivity through better integration of the Newcastle to Greater Sydney economies, more productive business connections, greater competition, access to markets and higher paying jobs and labour supply. Improved business productivity underpinning wider economic benefits, is forecast to accrue $3.7 billion in benefits (PV, 2024-25$). Internationally, HSR has delivered higher productivity benefits and Infrastructure Australia recommends reviewing productivity benefit estimation methods from international case studies to improve certainty. Travel time savings are also estimated to contribute to productivity benefits. Connectivity improvements within the corridor reduce journey times between Newcastle and Sydney Central to around 1 hour, from 2h35, Newcastle to Parramatta to around 1h15 from 2h37, and Newcastle to Western Sydney International to around 1h30, from 3h26, for an estimated 22.7 million trips per annum in 2061. Travel time savings contributes around 6% of total benefits. This is low compared to other transport proposals and may be underestimated given the scale of connectivity improvements. Operating on a dedicated line, separate to freight movements, the project also delivers significantly improved reliability compared to the existing rail service. Infrastructure Australia agrees with the proponent's analysis that the proposal has the potential to deliver significant productivity benefits and we recommend the proponent considers further analysis

	to strengthen the productivity benefit estimation. This could include specific benefits for rail freight on the existing rail line as a result of increased capacity.
Environment	Delivering HSR will have significant environmental impacts within the Newcastle to Sydney corridor. The HSRA prepared a thorough preliminary environmental assessment to inform design, economic impacts and to identify residual biodiversity impacts and areas for further assessment. Their assessment found the proposed HSR alignment will traverse nine national parks, four nature reserves, two regional parks, one State Conservation Area and one State Forest, and will impact threatened flora and fauna, waterways and wetlands, and Aboriginal and non-Aboriginal heritage sites, noting that impacts will be reduced to many of these areas through the use of tunnelling. The business case notes a Biodiversity Offset Strategy is being prepared and the cost estimate allows $104 million for biodiversity offsets, risks and contingency costs related to Stages 1A and 1B only. This estimate appears extremely low given the scale of the impacts. The business case notes that environmental approvals will follow the *Environmental Planning and Assessment Act 1979 (NSW)* and the *Environmental Protection and Biodiversity Conservation Act 1999 (Cth)* as part of the Development Phase. The proposal risk analysis recognises environmental impacts and approvals are likely to directly impact project costs, design, stakeholder engagement, scheduling and delivery. Infrastructure Australia recommends environmental investigations are prioritised to improve certainty on impacts and offset costs.
Sustainability	The extent of work to inform the proposal's sustainability plan reflects emerging best practice. However, further work is needed to improve cost certainty and to identify opportunities to reduce emissions. Overall, the proposal will lead to a net increase in GHG emissions over the appraisal period. The business case estimates that the proposal will generate almost 3.7 million tonnes of carbon dioxide equivalent (TCO2e) during construction, with only 86 thousand TCO2e being reduced through removing vehicles on roads. While HSR Stage 1 is estimated to deliver a net increase in emissions, future stages that will provide fast and reliable alternatives to flights between some of the world's busiest flight corridors, are expected to materially reduce Australia's emissions. The proposal's Net Zero Roadmap notes HSRA will seek to achieve net-zero emissions in construction by 2035 through initiatives to reduce and avoid emissions, including adopting reduced emissions steel, concrete and generating renewable energy. The proposal acknowledges there is uncertainty regarding the costs and suitability of materials to reduce emissions. To mitigate this risk, HSRA will engage directly with suppliers to control material procurement and retain greater control through manufacturing. Based on the assumption that emissions will be avoided or minimised during construction, the economic appraisal monetises only residual emissions of 1.3 million TCO2e. This approach does not align with the IA *Guide to assessing greenhouse gas emissions* or state government requirements to monetise direct, indirect and embodied emissions.
Resilience	The proposal considers both transport network resilience and resilience to climate change. The existing train line is prone to disruption and closures with an average of 3.3 delay events per week. A dedicated HSR connection is forecast to free up approximately 60,000 seats on existing rail services by 2061, delivering $2.6 billion in benefits (PV, 2024-25$) from less crowding on train services, additional capacity for more passenger or freight services, and reduced road congestion. The proposal's climate risk assessment identified 31 key project risks across eight hazard types. The most significant risks relate to precipitation and flooding (23%), followed by increased temperature, sea level rise and storm surge, and bushfire (all 16%). The level of analysis at this stage is focused on addressing high priority resilience items, which is appropriate. The proponent is addressing flooding related risks through project design and further work on flooding and other climate related risks will be considered at later stages. Further consideration of these risks through the Development Phase is likely to impact cost and delivery and this contributes to uncertainty regarding the current project costs.

Deliverability	The capability to deliver the proposal successfully, with risks being identified and sufficiently mitigated.
Ease of implementation	The proponent has completed appropriate planning and implementation analysis, with further design development, approvals, and cost accuracy proposed for the Development Phase. The constructability assessment confirms all sections of the proposal can be built using current general construction methods and materials. The Development Phase will focus on critical complexities including legal and planning approvals, multi-agency agreements, property acquisitions and commencement of an Early Contractor Involvement (ECI) process. This competitive process will develop designs and costings in detail, with early market testing to confirm the scope and scale of the packages.
Capability & capacity	The proponent has engaged with the market to understand capacity and capability. There are identified risks that could be managed through the Development Phase, particularly building capacity within HSRA, capacity in the market during delivery, and management of global supply chain constraints. Approximately 7,500 direct construction-related jobs, across 25 occupations, are required on an average annual basis over the 2026-38 period. The proponent identified significant workforce gaps from 2029 to 2036 across NSW, particularly in Heavy and Civil Engineering Construction where the demand for workers is expected to exceed supply by 35%.
Project governance	The extent of analysis to inform procurement, funding and governance is appropriate for the Newcastle to Sydney section. We are supportive of the proposed approach to verify funding and governance in the Development Phase to incorporate further market sounding. Given the scale of the cost estimate and the length of the construction period, securing the level of required funding presents a risk to the project. HSRA has investigated opportunities to leverage private funding during the construction phase and value sharing mechanisms are being considered, as well as developer contribution schemes, betterment levies and lease variation charging. The proposal assesses a range of procurement models and identified opportunities for economies of scale through a common commercial approach. We agree with the proponent's approach to develop a more detailed assessment for the Development Phase which draws on market and global best practice.
Risk	There are significant risks associated with delivering the proposal given the scale and complexity of the preferred solution. The business case captured an appropriate number of risks, with processes to own and manage risks being developed and assessed at each project phase. Risks are captured in contingency using a probabilistic risk process that follows best practice. The cost plan was estimated by HSRA through a combination of first principles, unit and composite rates applied to a point in time design reported by HSRA as being at 10% - 15% maturity. Costs are expected to change significantly as design maturity increases. At this stage the key risks identified by the proponent include: • financial, product and operational risks: under (or over) estimation of costs and revenue, design and construction challenges, and various operational readiness requirements • planning and environmental delays: issues with approvals, planning submissions and unexpected conditions • property acquisition and corridor challenges: difficulties in securing the preferred corridor and potential acquisition process uncertainty and delays • market and supply chain issues: contractor market appetite, capacity and supply chain concerns.
Lessons learnt	The proposal demonstrates clear efforts to draw on lessons from comparable projects nationally and internationally. The proposal draws on international HSR networks to inform the design (station experience, rolling stock), delivery and procurement strategy (two year planning phase, modern methods of construction, and risk sharing approach), and risk and cost estimates. The benefits realisation plan, including a post completion review, are proposed to be refined in the Development Phase. If the proposal proceeds, we recommend the Development Phase capture the

full post completion review requirements included in the Infrastructure Australia Assessment Framework (IAAF) (Stage 4).[6] There should also be further consideration of responsibilities and requirements of the private sector identified through the ECI process, and integration with the benefits realisation plan and post completion review. This process will also create evidence to inform planning and delivery for future HSR stages.

The Development Phase should include preparation of a comprehensive exit strategy that provides a clear pathway to successfully conclude or transition out of the project in the event it does not progress to the Stage 1 Delivery Phase, and subsequent stages.

Economic appraisal results (preferred option)

The proponent reported CBA results in ranges to reflect alternative cost and benefit assumptions and recommends considering the CBA results at a 4% discount rate. Infrastructure Australia recognises that for projects such as HSR with expected multigenerational benefits over 50 years, the discount rate will disproportionately impact benefits measured over the full appraisal period. Costs however, which predominantly accrue during delivery over a shorter period, are less impacted. HSRA also included the economic results at 7% and 10%, as required by the Australian Government.

At a 4% discount rate, HSRA reports the BCR for Stage 1 is between 0.8 to 1.0[7], with an NPV of -$10.5 billion to $2.6 billion. The table below summarises the results using the upper bound estimates for capital costs and lower bound estimates for housing supply to represent a worst case scenario.

Sensitivity testing completed by HSRA on costs, benefits and discount rate assumptions, appropriately considers potential upside and downside impacts. However, the sensitivity analysis demonstrates that only under low cost or high benefit scenarios when including land use benefits and wider economic benefits, would the benefits of the proposal outweigh its costs.

	Discount rate:	4%	7% (central)	10%
Core evaluation results[1,2,3,4]	**BCR:**	0.2	0.1	0.0
	NPV ($m):	-$48,300	-$43,200	-$35,900
Results with land use benefits[1,2,3,4]	**BCR:**	0.6	0.4	0.2
	NPV ($m):	-$24,900	-$30,100	-$28,100
Results with land use benefits and WEBs[1,2,3,4]	**BCR:**	0.8	0.5	0.3
	NPV ($m):	-$10,500	-$24,900	-$26,100

Key benefits measured:

The proponent has undertaken an extensive and robust economic appraisal categorising economic benefits in alignment with the project objectives to demonstrate impact of the proposal and link to the case for change.

The proponent's economic appraisal demonstrates that benefits associated with land use change is the largest component of total benefits – contributing 58%, with transport benefits at 19% and wider economic benefits at 23%. This includes:

- more productive land use (housing) capturing the benefit associated with changes in land use zoning and density (38.7% of total benefits)
- investment attraction (including Foreign Direct Investment) capturing the productivity uplift for domestic firms located within the corridor (12% of total benefits)
- less expensive house price and rents capturing reduced rental stress and the welfare benefits for new first home buyers (9.8% of total benefits)
- generalised time savings for HSR journeys capturing reduced travel times for rail and road users (5.8% of total benefits).

[6] Infrastructure Australia, 2021, Stage 4 Post completion review. Available: https://www.infrastructureaustralia.gov.au/stage-4-post-completion-review
[7] Assuming P90 and including WEBs.

	The key benefits driver is housing supply, estimated by the proponent as 46,000 additional households expected due to better accessibility. A further 52,000 to 104,000 households are expected due to the population redistributing itself among a larger number of dwellings, resulting in a smaller household size. This is followed by connectivity improvements enabled by the HSR connection, reducing journey times by up to 70% between key locations. In addition to this, the economic appraisal captures environmental benefits associated with mode shift to more sustainable modes, social value, tourism impacts and wider economic benefits improving market efficiencies.
Key observations and issues	Infrastructure Australia recognises the substantial amount of work that has been undertaken by HSRA in a very constrained timeframe. HSRA has also recognised the impact of the timeframe in delivering the business case and some material limitations of the analysis. The economic appraisal used both innovative and best practice methodologies to comprehensively assess the social, economic and environmental impacts of the proposal. The appraisal aligns with the IAAF in most areas, although we note the following observations and issues that are likely to have a negative impact on the net benefits of the proposal and reduce the BCR: • Assumptions underpinning the transport demand model and land use models are inconsistent, noting HSRA's advice that these models were used for different purposes. The spatial coverage of transport demand, which covers the Sydney Greater Metropolitan Area, and land use modelling, covering Australia's East Coast. The inputs adopted (e.g. variable demand vs fixed demand) affects the modelled responses to the proposal. This has implications for design, network integration, costing and representation of benefits and disbenefits in the economic appraisal. • The additional housing capacity assumes household size will reduce by 2.8%, and therefore more houses will be required. While there is evidence of a trend in declining household size, there is insufficient evidence to support this assumption, which is comparable to the reduction is household size experienced during the Covid-19 pandemic. Average household size increased again post pandemic in December 2023 as tourism and migration constraints were relaxed. Assuming average household size would reduce by a comparable amount to that of a global pandemic is not realistic in the absence of other economic conditions and policy settings experienced during a global pandemic driving household behaviour. If land use benefits and wider economic benefits are excluded, the BCR reduces to 0.2 at a 4% discount rate, or 0.1 at a 7% discount rate. • The approach to monetising emissions does not align with IA's *Guide to assessing greenhouse gas emissions*. Monetising the emissions that have been excluded in the CBA would materially increase economic costs and reduce the BCR. • The social value assessment does not align with the land use change from the proposal. Further consideration by governments of social infrastructure capacity to meet needs or costs associated with the additional services is required. • Methodological issues identified in peer reviews, including the definition of the reference group to clarify beneficiaries and distribution of benefits across the country, and maturity of project-specific benefit assumptions, appear not to have been addressed. • Construction disruption impacts are likely and are not estimated in the CBA. Depending on extent, this would negatively impact the estimated benefits and reduce the BCR. We also observed that benefits from more reliable journeys, improved network resilience, and impacts of improving place, have not been estimated and this is likely to increase the CBA results. These issues and other uncertainties need to be addressed to better inform a final investment decision for delivery of the Newcastle to Sydney section.

Source: Proponent's business case

(1) Costs reported in this table are based on P50 cost estimates and upper bound contingencies.

(2) Benefits reported in this table are based on lower bound housing supply assumptions.

(3) The net present value is calculated as the present value of total benefits less the present value of total costs.

(4) The benefit–cost ratio is calculated as the present value of total benefits divided by the present value of total costs

Proposal development

HSR has been investigated by Australian governments since the 1980s. The last major studies conducted were the High Speed Rail Study[8] between 2011 and 2013 that explored options for an East Coast HSR network connecting Brisbane, Sydney and Melbourne, and in 2019 Transport for NSW and the Department of Infrastructure, Transport, Cities and Regional Development jointly prepared a Sydney to Newcastle Fast Rail Strategic Business Case that explored high and fast rail options to service the corridor. These studies identified that a HSR solution should be further explored, with the Australian Government in 2023 committing funding to the early stages of developing HSR and to deliver a business case by the end of 2024.[9]

The business case is set in the context of a new HSR network connecting Australia's East Coast with a focus on the Newcastle to Sydney corridor. The business case builds on the previous studies and considers changes to broader context including changes in population size and distribution, renewed policy focus on regional areas, net-zero commitments, impacts of the COVID-19 pandemic[10] and technology advancements.

We recognise the business case was prepared in a highly compressed timeframe and note the significant volume of work and collaboration the proponent undertook in this short period. We note the business case is largely focused on HSR solutions, considering alternative modes, station locations and alignments in the options analysis process. This included four stages:

- Alternative and Deferral – this stage conducted a strategic merit test of 10 strategic alternative options including demand management, better use, capital investment (non-rail) and capital investment (rail) leveraging the significant bodies of work undertaken in 2013 and 2019. This concluded that heavy rail infrastructure could achieve all project and network objectives, with only a dedicated HSR line being most closely aligned.
- Station Locality – this stage involved a strategic merit test of a long list of 26 station locations within the Newcastle to Sydney corridor involving qualitative scoring against the Network and Project objectives. This concluded with a shortlist of 13 station options including both anchor stations (where HSR must pass through) and other potential station locations.
- Alignment scenarios – this stage arranged the short-listed stations into a long list of 18 alignment options. These were assessed through a strategic merit test focused on: catchment and accessibility analysis, demand and land use considerations, strategic technical analysis, preliminary rail operations analysis, strategic costings and other qualitative factors. This concluded with six shortlisted options being identified.
- Project options analysis – this stage adopted a three stage multi-criteria analysis (MCA) to select the preferred option including a quantitative MCA and rapid economic appraisal. This concluded in identifying the preferred option of delivering Option 1 (Central) as a staged approach towards Option 3 (Western Sydney International).

The business case subsequently focused on presenting detail of the preferred solution through two staging options:

- "Project" reflecting a dedicated HSR alignment from Newcastle to Sydney with six stations at Broadmeadow, Lake Macquarie, Central Coast, Sydney Central, Parramatta and Western Sydney International
- "Stages 1A and 1B" reflecting the first two stages of the dedicated alignment from Newcastle to Sydney with four stations at Broadmeadow, Lake Macquarie, Central Coast, Sydney Central.

Proposal engagement history

HSRA regularly engaged with Infrastructure Australia through monthly meetings from July 2024 to Dec 2024. At these meetings Infrastructure Australia provided advice to HSRA on preparing the business case to meet the requirements of the IAAF.

[8] AECOM, 2013, High Speed Rail Study: Phase 2 Report. Available via: https://media.caapp.com.au/pdf/x5zajt/2d31e662-75e2-45e4-9a45-dc48e577120d/2013%20HSR%20Study%20Phase%202%20Report.pdf

[9] *Budget Paper No. 2, Budget Measures 2024–25*, Commonwealth of Australia 2024, Canberra, May 2024, p. 164. Available via: https://budget.gov.au/content/bp2/download/bp2_2024-25.pdf

[10] Travel behaviour change from the COVID-19 pandemic is captured in the transport demand modelling (PTPM) reflecting post-COVID behaviour settings (for example increased working from home) in the future base case (2041 and 2061) recommended by Transport for NSW's Advanced Analytics and Insights (AAI) team. The post-COVID update to travel zone projections (TZP24) was not available to inform final modelling or sensitivity testing and has not been incorporated into land use projections.