

# *High Speed Rail in Australia*

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November 2024



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A variety of high-speed trains at Madrid's Atocha Station, April 2023. Photo: Author.

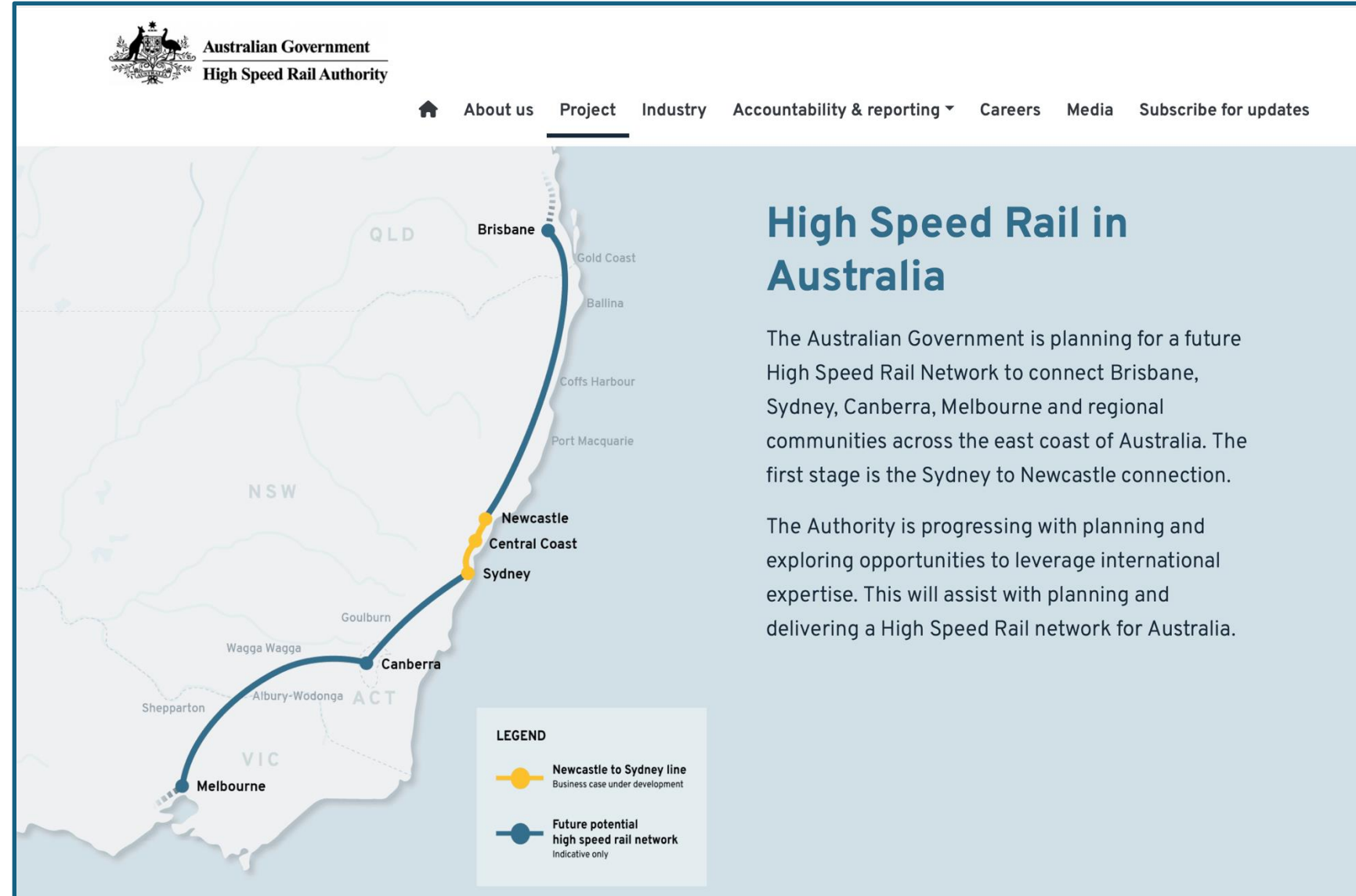
# The slow route to High-Speed Rail in Australia



Year	Scheme	Proposed By	Details	Fate
1984	High Speed Rail	CSIRO	Sydney-Melbourne	Rejected by Federal Liberal Govt 1986
1990	Very Fast Train	Elders, TNT, BHP, Kumagi Gumi	Melbourne-Brisbane	Rejected by Federal Labor Govt, 1991
1993	Speedrail	Leightons and Alstom	Sydney-Canberra	Rejected by Federal Liberal Govt, 2000
1995	Tilt Train	NSW Govt	Sydney-Canberra	Dropped by NSW Govt, 1997
2002	East Coast HSR	Federal Lib Govt	Melbourne-Brisbane	Dropped by Federal Liberal Govt In 2004
2008	HSR	Federal Labor Govt	Melbourne-Brisbane	Rejected by Federal Liberal Govt 2014
2014	East Coast HSR	Beyond Zero Emissions (Public Advocacy Gp)	Melbourne-Brisbane	Rejected by Federal Liberal Govt
2017	Very High-Speed Corridor	CLARA (Private Group)	Sydney-Melbourne	Rejected by Federal Labor Govt
2021	HSR	Federal Govt	Sydney-Newcastle	???

# Light at the end of the Tunnel?

- In 2022, The Federal Government announced as an election promise the establishment of a High-Speed Rail Authority
- HSRA was eventually established and staffed, with a promise of \$500m from the Federal Government
- Its Initial priority is the stage from Sydney to Newcastle (approx 160km).
- Serious work began in January 2024, drawing on previous Federal and NSW Govt studies.





# The HSRA Approach

- Objectives
- What is HSR?
- Current Program
- Funding
- Decision Framework



*Note: This section is based on an industry briefing by the HSRA in August 2024.*

# Generating social and economic value

- **Revitalising national industries** such as manufacturing
- **Strengthening local industries** – agglomeration benefits and greater worker catchments
- **Boosting tourism** and visitor economy
- **Creating vibrant places** with a mix of uses
- **Generating additional jobs** through delivery, maintenance and operations
- Becoming more **globally competitive** – attracting overseas industry and talent



- **Greater access** to, and choice of **education, employment** and **essential services** resulting in:
  - ▶ Greater workforce participation and education attainment
  - ▶ Improved health and wellbeing outcomes
  - ▶ Improved social connections
- **Improved security** through increased housing choice and availability
- **Increased** environmental and community resilience
- **Improved** social mobility and equity outcomes

# The high speed rail customer product

Comfort and flexibility at speed, connecting Australia with services that caters for all



## A new railway

- New high speed trains travelling at least 250 km/h, the same as those used around the world
- Dedicated high speed rail line
  - Fully accessible
- Frequent services and high reliability
- Easy and seamless connections



## Faster journeys

- Central Coast to Newcastle/Sydney  
~30 minutes
- Newcastle to Sydney  
~1 hour
- Canberra to Sydney  
~1.5 hours
- Brisbane to Sydney,  
Melbourne to Sydney  
~ 4 hours



## On board experience

- High speed WiFi
- Food, drink
- Luggage storage
- Premium services and quiet zones
- Pet friendly areas

# Current Program

## First Stage Sydney – Newcastle.

- Business case under development
- Due by end 2024.

## “Product Specification”

- Covers whole 1700 km route (Melbourne – Brisbane)
- Also due by end 2024



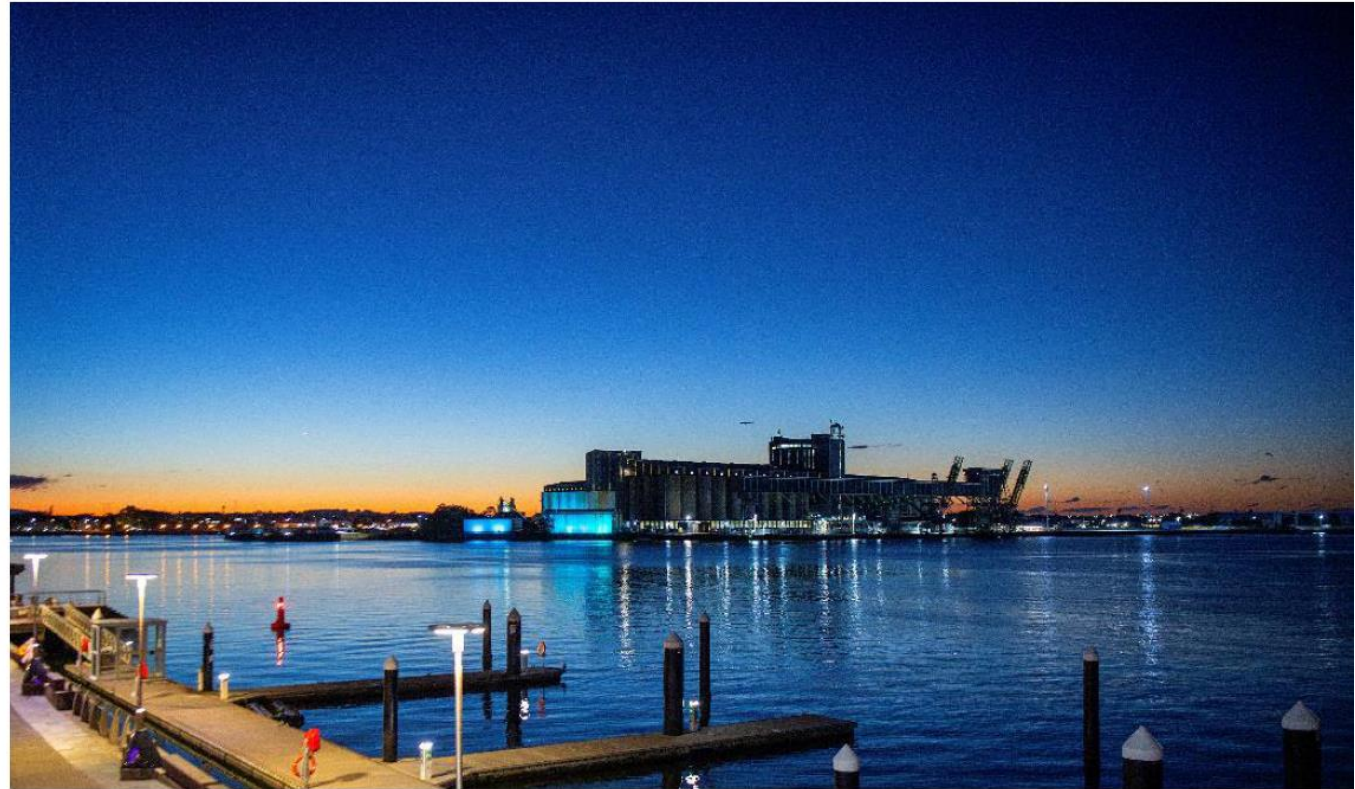


# Why Newcastle to Sydney

A nationally-significant corridor

## Connecting NSW's two largest cities

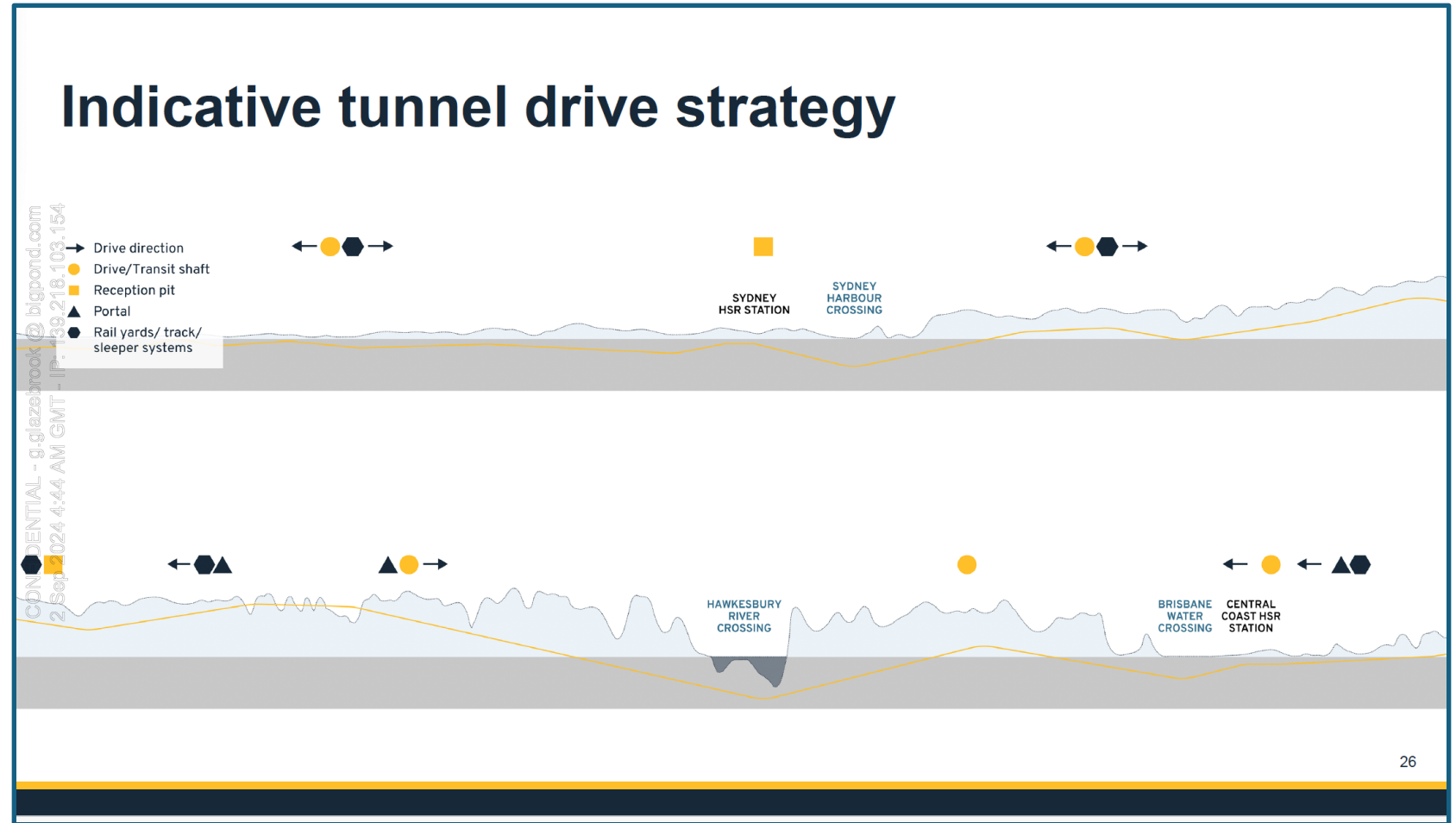
- Clusters of jobs and economic activity supporting population growth and Newcastle as a global gateway.
- Population is expected grow by 22 per cent to nearly 1.2 million by early 2040s.
- Central Coast and Newcastle areas support over 420,000 jobs.
- New homes expected in major greenfield areas and key centres – Gosford, Tuggerah/Wyong, Lake Macquarie and Newcastle.
- Existing Sydney-Newcastle rail line is one of the busiest intercity rail routes in Australia – used by more than 14.9 million passengers per year.



Newcastle Harbour

# Sydney – Newcastle: Challenges

- 165 km, 50-60% tunnel
- Up to 18 TBM's
- Longest tunnel 50-60km
- 10 years construction
- First services late 2030's



# Funding

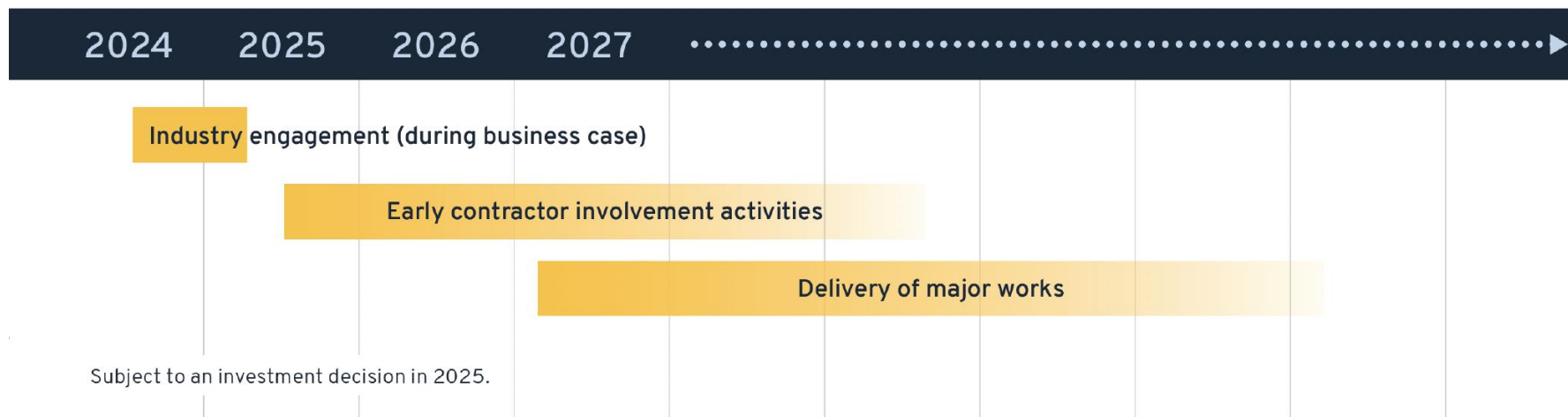
- 2013 study estimated cost of A\$ 114 Billion all up Melbourne to Brisbane
- Construction cost components likely doubled since then
- Likely to be split across Government and Private Sector:
  - Federal Govt bulk of infrastructure cost
  - State/ Territory to fund stations
  - Land Value Capture
  - Private Sector Operator (s) to fund Rollingstock?

# Decision Framework

- Business Case and Product Definition due by end 2024
- Federal Govt to consider and make investment decision
- Could then potentially be an election commitment (Election due by May 2025)
- If positive, delivery of major works from early 2027

## Indicative timeline

Subject to an investment decision in 2025, the Authority plans to execute major contracts from 2027 for the Newcastle to Sydney connection





# The Current Reality

## The Australian Paradox

- Large country, very low population density overall
- But highly urbanised and dominated by three big cities
- Distances between them significant, few intermediate cities
- World's most unaffordable housing. "Sydney or the Bush" syndrome.

## Challenges

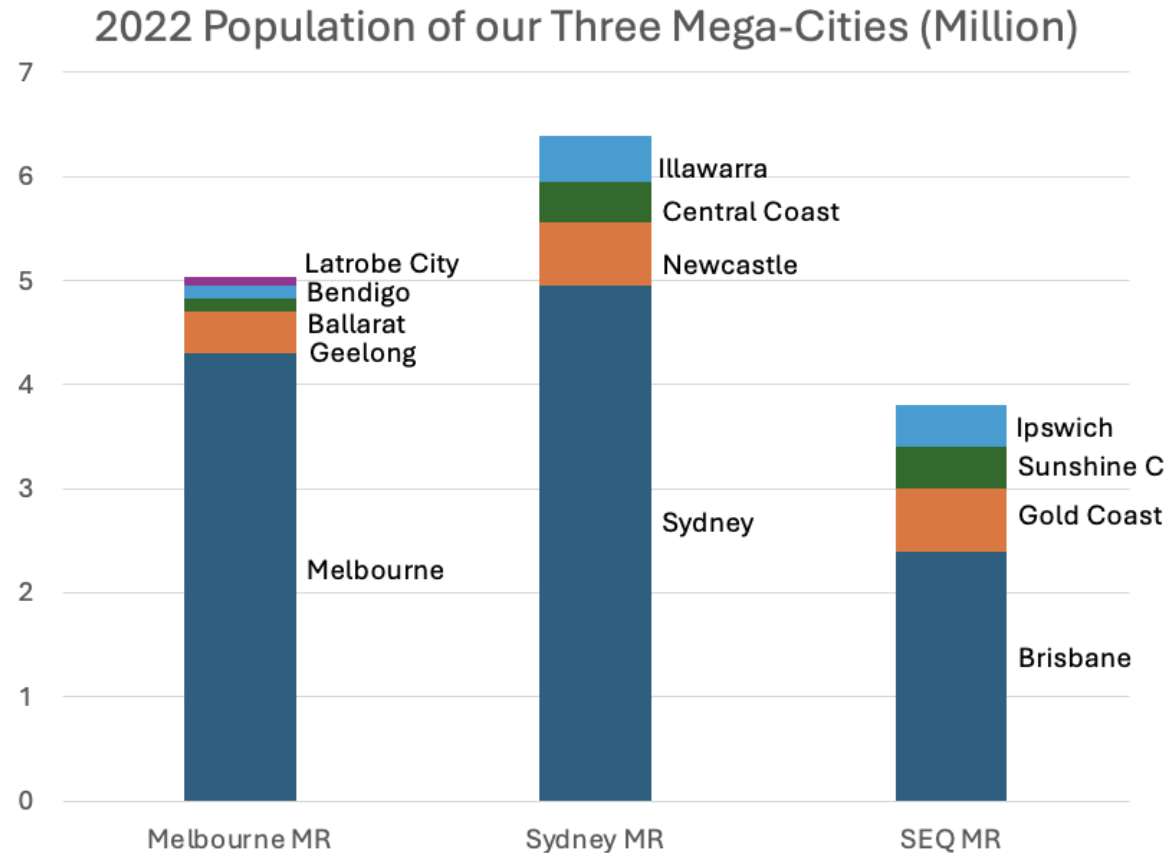
- Generally flat country, but difficult terrain around Sydney
- Ridiculously high cost of infrastructure in Australia
- Railways traditionally run by State, not Federal or Private sector
- Political realities dominated by big cities
- Powerful Airlines – World's 5<sup>th</sup> busiest air route is Sydney – Melbourne

## The Do Nothing Alternative

- "If you always do what you always did, you always get what you always have"
- No HSR means more highways and airports
- No solution to housing crisis or uneven economic opportunities



# Australia's “mega regions” are too dominant



- Our three mega-regions had 15 million people in 2022, and are dominating population growth
- All are experiencing
  - high housing costs,
  - rising congestion and
  - high costs of infrastructure.
- These problems are already spreading from the capitals to Newcastle, the Sunshine Coast and Geelong.
- State Governments are improving rail links within each mega region.
- But this won't be enough...

Source: <https://www.abs.gov.au/statistics/people/population/regional-population/latest-release>





# Fastrack Australia Approach

- Integrating our Mega Regions
- Horses for Courses
- Build and Operate in Stages
- National Passenger Operator
- Integrated Urban Development
- New Governance Arrangements



*s being reawoken after a long period of dormancy and a new Berlin  
Christian Charisius/dpa*





# Integrating our Mega-Regions

## High Speed Rail

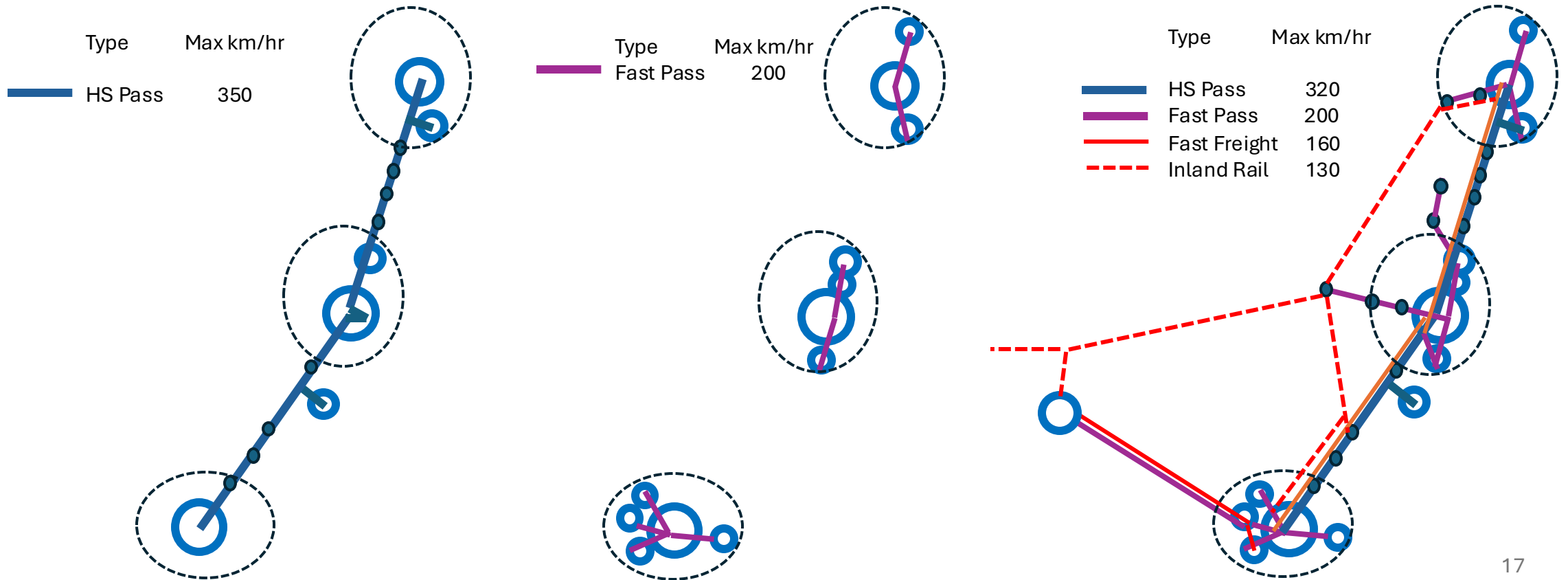
The 2013 report (1) envisaged a 350 km/hour stand-alone high-speed rail line connecting Melbourne, Sydney, Newcastle and Brisbane, with branches to Canberra and the Gold Coast, but few stops or connections to other cities

## Faster Rail

Victoria, NSW and Qld have been building or talking about upgraded rail links out of their capital cities to nearby regional cities, but with no coherent plans for high-speed rail connecting them.





















## Integrated Approach

Fastrack Australia propose integrating high-speed and faster rail, freight and passengers, and an extension to Adelaide, to produce an integrated network for SE Australia covering over 70% of our population.



# This will Minimize Costs and Maximize Benefits

- Reduces costs by sharing tracks appropriately
- Brings forward benefits by makes it easier to stage improvements to infrastructure and services.
- Combines benefits of high-speed rail and fast rail

Benefits	Stand-Alone HSR	Fast Rail Only	Integrated National Network	
Long Distance Passengers				
Commuter Passengers				
Freight Efficiency				
Decentralisation				
Regional Development				
Emissions Reduction				
Housing Choice and Affordability				

# Horses for Courses

Type of Infrastructure	High-Speed Lines	Existing Lines	Inland and Transcon Lines
Electrification	25 KV AC	Generally not, except suburban	No
Axle Loads	22 tonnes	19 – 30 tonnes	25-30 tonnes
Permitted Speeds	Up to 350 km/hr	Up to 160 km/hr	Up to 120 km/hr
Curvature	Low	Often very significant	Varies

**Trains running mostly on High-Speed Lines**



**Trains running both on high speed and on existing lines**



**Trains running on existing lines**



**Trains running on Inland and Transcontinental Lines**



**Stadler Dual voltage Commuter Train**



**Cargobeamer fast freight train.**



**Vlocity Regional Train**

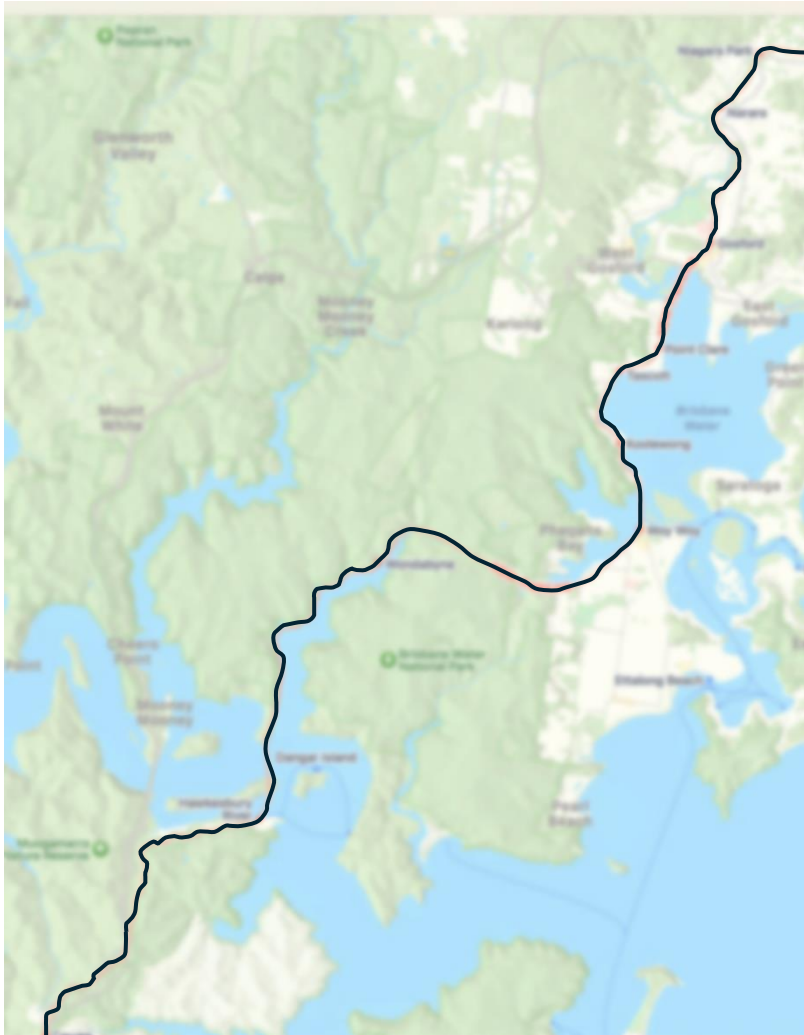


**Long Distance Tourist Train**





# The Sydney – Newcastle Corridor



- Existing rail is **slow and congested** due to 19<sup>th</sup> century alignments, and the volume of commuter, freight and long-distance passenger traffic.
- HSR between Sydney and Newcastle could **treble total rail capacity**, and allow **faster travel**, facilitating
  - Population growth
  - Mode shift from road as rail services are accelerated
  - Additional freight and long-distance passenger trains
- Requires both the existing and the new line.
- **But how best to achieve this?**



New Intercity Train to be introduced shortly on the Sydney – Newcastle Route.



Freight Train on the Cowan Bank.

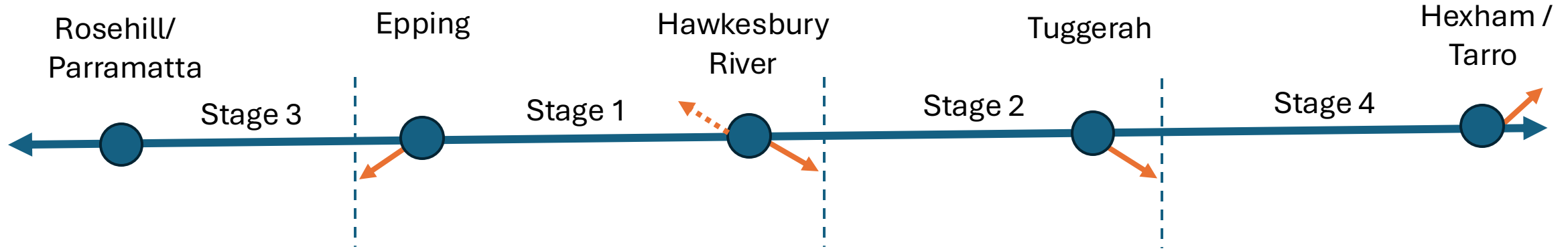
Section of the “Short North” through the Central Coast, showing the excessively winding route built 130 years ago.

For more details, see <https://www.fastrackaustralia.net/newcastle-corridor>



# Build it in Stages: Example Sydney to Newcastle

Fastrack Australia suggested building HSR between Sydney and Newcastle in four stages.

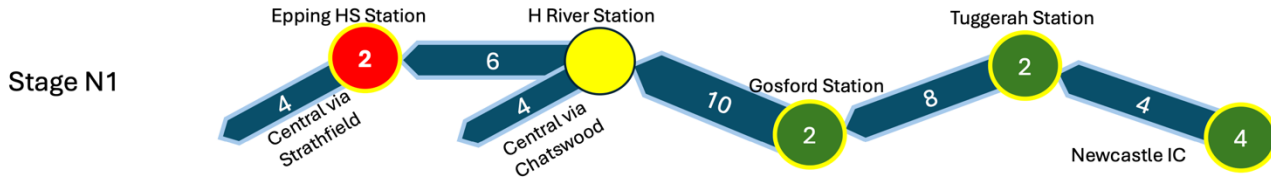


Stage	N3	N1	N2	N4
From	Rosehill/Parra	Epping (W Ryde)	Hawkesbury R	Tuggerah
To	Epping	Hawkesbury R	Tuggerah	Newcastle West
Civil	Tunnel	Tunnel	Bridge + Tunnel	Mostly Surface
Station(s)	Rosehill / Parramatta	Epping (Underground) Hawkesbury R (surface)	Tuggerah (surface)	Newcastle West (Surface)
Power	25 KVAC	25 KVAC	25 KVAC	25 KVAC
Max Speed	200 kph	250 kph	250 kph	320 kph

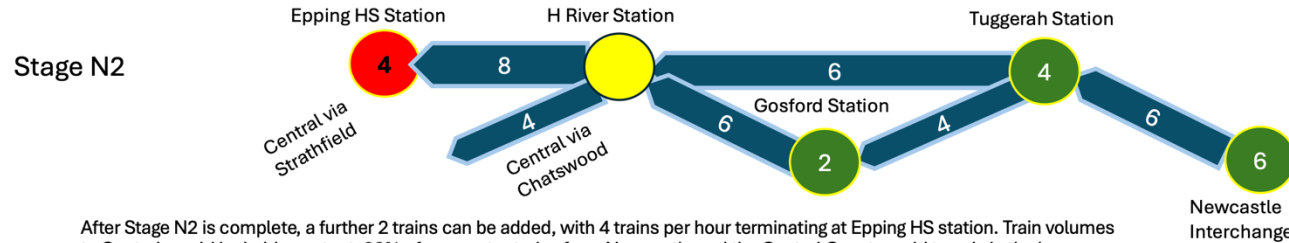
# Staging of Service Enhancements

2 Trains starting /hour  
2 Trains terminating /hour

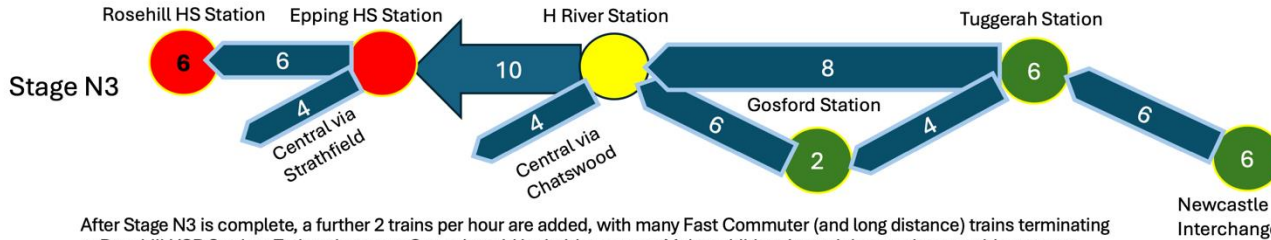
Southbound trains in morning peak hour (Commuter services only shown)



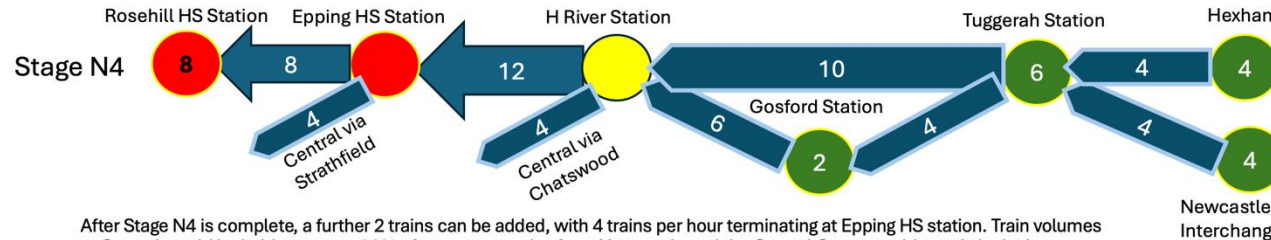
After Stage N1 is complete, a 25% increase in capacity can be accommodated, with 2 trains added, terminating in the centre roads of Epping Underground Station. Train volumes to Central would be held constant. 60% of commuter trains from Newcastle and the Central Coast would travel via the long tunnel, saving at least 15 minutes travel time compared with current services.



After Stage N2 is complete, a further 2 trains can be added, with 4 trains per hour terminating at Epping HS station. Train volumes to Central would be held constant. 66% of commuter trains from Newcastle and the Central Coast would travel via the long tunnel, saving 15-35 minutes travel time depending on their starting point.



After Stage N3 is complete, a further 2 trains per hour are added, with many Fast Commuter (and long distance) trains terminating at Rosehill HSR Station. Train volumes to Central could be held constant. Major additional travel time savings would accrue to passengers for destinations such as Parramatta, Olympic Park, Five Dock, Pyrmont and the northern CBD. The centre roads at Epping HS station would be used to terminate Fast Suburban Trains from Glenfield via Rosehill.



After Stage N4 is complete, a further 2 trains can be added, with 4 trains per hour terminating at Epping HS station. Train volumes to Central would be held constant. 66% of commuter trains from Newcastle and the Central Coast would travel via the long tunnel, with significant travel time savings depending on their starting point.

# Increasing Speeds and Frequencies

- After Stage N1 (Epping – Hawkesbury River) was completed, fast intermodal services would be introduced, using the long tunnel to significantly cut travel times between Newcastle and the Central Coast and Sydney.
- The current total of 8 services per hour departing Gosford in the morning peak would be increased to 10 per hour, with 4 continuing up the Cowan Bank to serve Berowra, Hornsby, Gordon and Chatswood, while six would use the high-speed tunnel to Epping, and continue on to Central via Strathfield using the existing line.
- After Stage N2 (Hawkesbury River to Tuggerah) was completed, fast commuter services from Newcastle would be further accelerated, and the total number of services from Newcastle and the Central Coast would be increased to 12 in the peak hour.
- After Stage N3 between Epping and Parramatta / Rosehill was completed, the fast commuter services would be diverted to terminate at Parramatta, and total services increased to 14 per hour, of which 10 would utilise the high-speed tunnel between Hawkesbury River and Epping.
- Finally, after Stage N4 was completed, new high-speed services would start from the high-speed station near Hexham, with a total of 16 services per hour between Newcastle/Central Coast and Sydney in the peak hour.
- The high-speed sections would also accommodate fast Inter-regional trains from the north and north-west (eg from Brisbane, Coffs Harbour, Armidale, Tamworth and the Upper Hunter).



# A National Passenger Rail Operator

- Only 12 daily long-distance passenger trains between Melbourne, Sydney, Canberra, Brisbane and Adelaide
- All are very slow (average 70-80 km/hr) due to 19<sup>th</sup> century alignments
- Most trains are now nearing 40 years old.
- Long Distance Trains are run by State Operators with no incentive to improve services
- A National Operator is needed to innovate, grow the passenger market while the high-speed lines are being built.

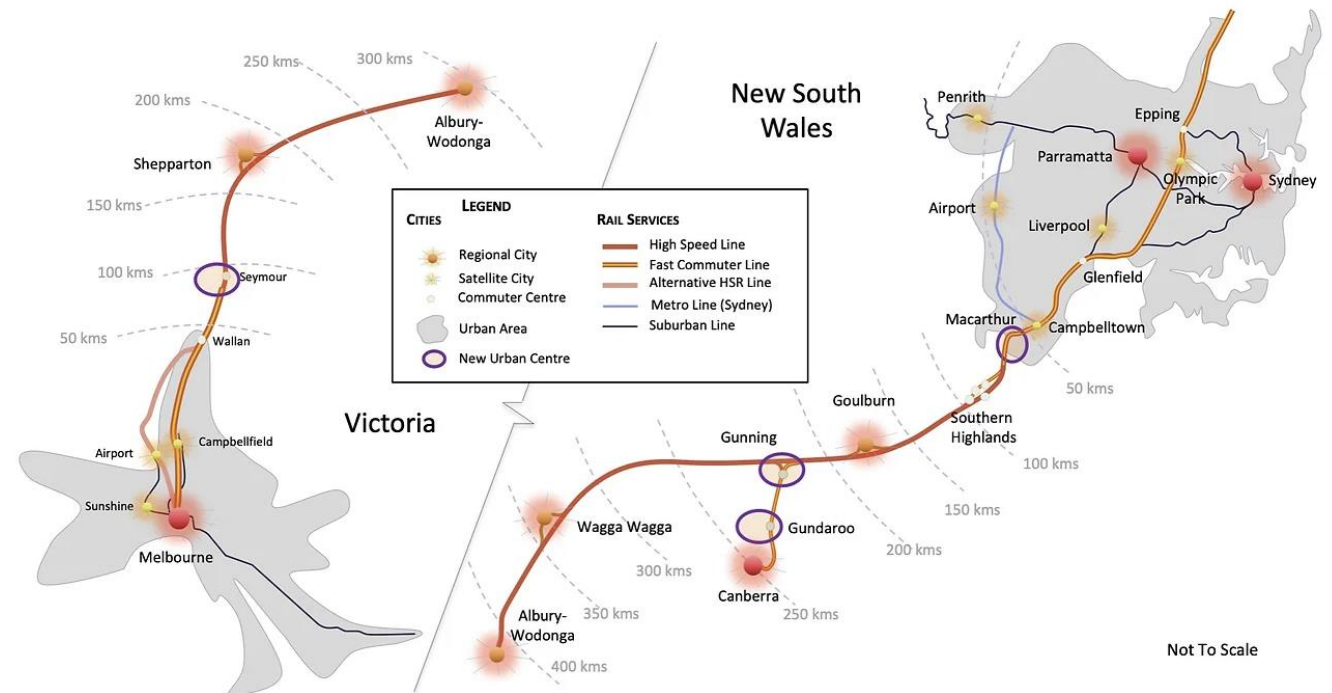
For more details, see <https://www.fastrackaustralia.net/national-operator>



# Integrated Urban Development

- HSR allows more balanced population patterns
  - Improved housing affordability
  - More equitable access to services, jobs
- Integrated Urban Development Strategies
  - Improved sustainability
  - Improved lifestyle options

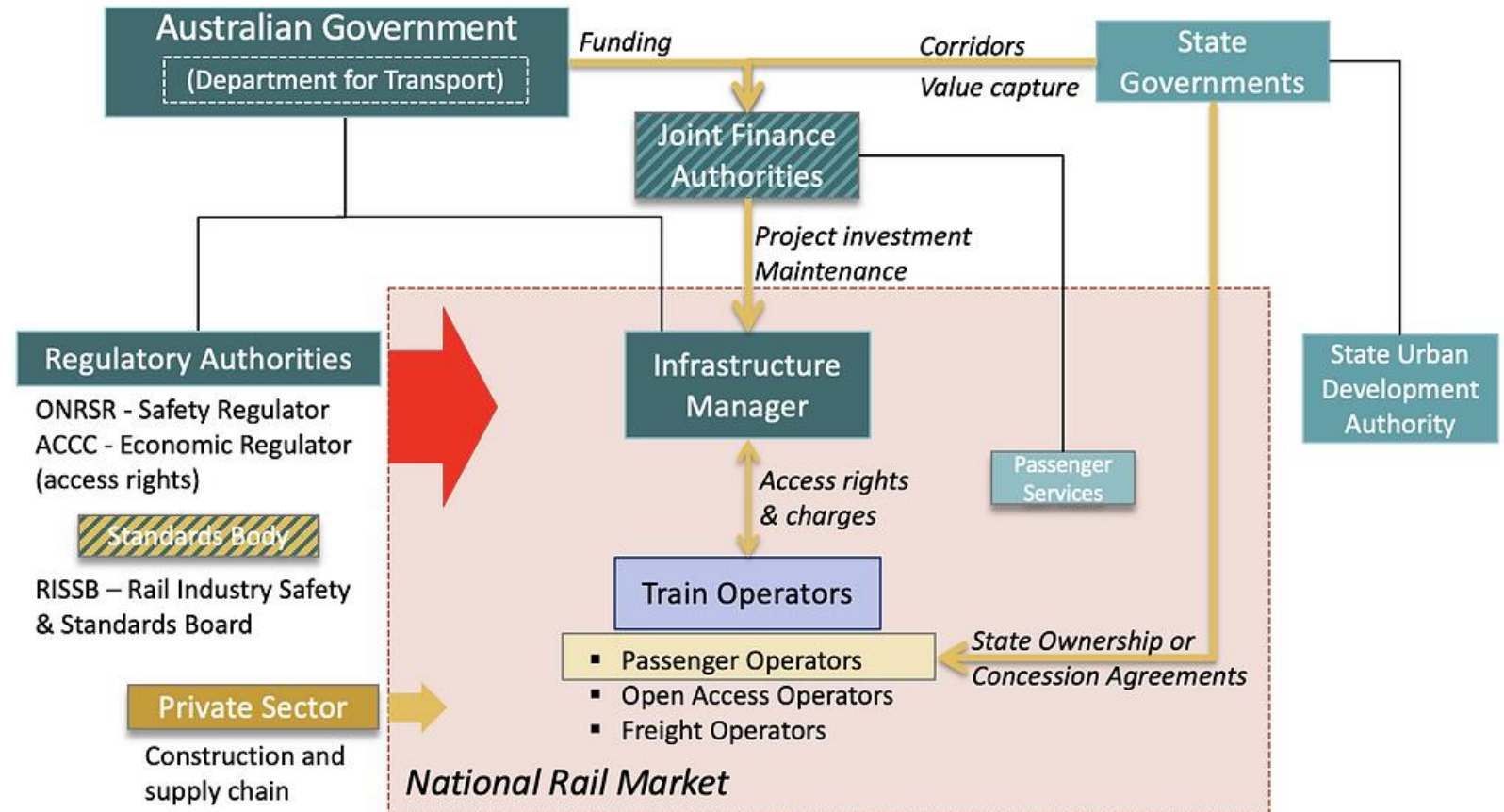
Creating economic connections by shrinking the distance between regional cities



For more details, see <https://www.fastrackaustralia.net/national-operator>

# New Governance

- Currently too complex
  - Many track managers
  - Inappropriate access charges
  - Lack of standards
  - Barriers to rail
- New arrangements needed
  - National perspective
  - Streamlined structures
  - New approaches to planning and land value capture



# Parallels with the US ?

- **Appropriate corridors and proven technology**
- **Long-term political and funding support**
- **Smart ways to cut build costs**
- **Avoid conflicts over corridor land**
- **Note the costs of the “do nothing” approach**
- **Sell it as a nation building project**
- **Emphasize its strategic significance**

## The State Of High-Speed Rail Projects In The U.S.

High-speed rail projects & proposals and their projected cost in the U.S., by construction/funding phase

— Fully funded — Partially funded/  
under construction — Lacking significant  
funding



As of Apr. 25, 2024

Source: Statista Research

<https://www.forbes.com/sites/katharinabuchholz/2024/04/29/the-state-of-high-speed-rail-projects-in-the-us-infographic/>



# Where to from Here?

## Australia

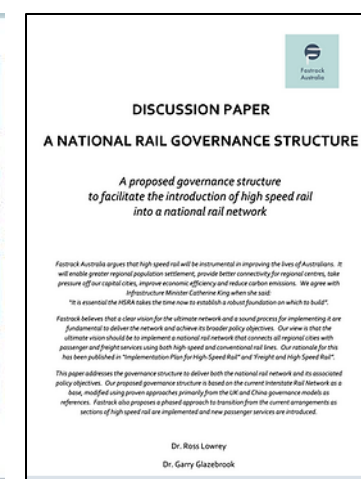
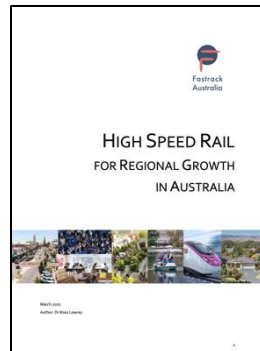
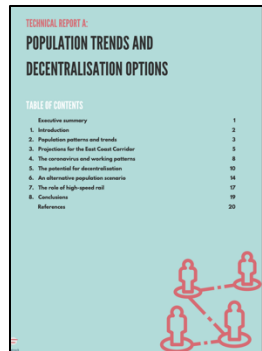
- Positive signs but depends on the next election. Coalition not yet on board.
- Also depends on budgetary situation even if Labor returned.
- Long wait for first HSR operation even if proceeds
- Need for shorter-term staged developments to generate public support
- Open question as to whether I will see it in my lifetime?

## USA

- California HSR – likely to depend on election
- NE Corridor – some progress inevitable, but will be limited by budgets
- Las Vegas – some progress. Appeal to Republicans as a private sector initiative?
- Florida – Incremental expansion of Brightline.
- Texas – could it be resuscitated?
- Overall – could it be accelerated as part of a stage 2 “Inflation Reduction Act”?

# Thank you...For Further Information

To download the detailed reports below and for presentations, database and other information on high-speed rail, see [www.fastrackaustralia.net](http://www.fastrackaustralia.net)



Report	High Speed Rail – A New Approach	Population Trends and Decentralisation Options	High Speed Rail for Regional Growth	Implementation Plan for High-Speed Rail	Implications of High-Speed Rail for Canberra and the Capital Region	Freight and High-Speed Rail	A National Rail Governance Structure	The Route Through Sydney	A National Passenger Rail Operator	Integrated Network for Sydney-Newcastle Corridor
Author	Glazebrook	Glazebrook	R Lowrey	Glazebrook & Lowrey	R Lowrey	Glazebrook	Lowrey	Glazebrook	Glazebrook	Glazebrook
Data	2021	2021	2021	2023	2023	2023	2023	2023	2024	2024
Key Focus	Overall Concept	Population & Decentralisation	Regional Growth	Staging Plan	Canberra HSR	Freight	Governance	Routes & Alignments	Operation	Integration