High Speed Rail in Australia

Proposals / EOI's / Studies

- 1980s – "VFT" Sydney – Canberra – Melbourne
- Early 1990s – "SpeedRail" Sydney – Canberra
- Late 1990s – VHST Competition Sydney – Canberra with 4 bidders
  - 200-250 km/h High Speed + Tilting Capability
  - 300-350 km/h Very High Speed Non Tilting
  - 500 km/h Maglev
- ARUP-TMG ECVHST Study 2001;
- Rail CRC Study 2009/2010;
- Infrastructure Partnerships Australia/AECOM Report
- September 2010 - Department of Infrastructure and Transport Internal Brief *"A profile of high Speed railways"*
- 2011 – Government award of new study phase 1.
- 2012 – Stage 2 study awarded

East Coast Very High Speed Train Study 2001

Key Study Objectives

- Is there a place in Australia's transport strategy and policy for an East Coast VHST?
- To provide the Australian Government with an analysis of VHST potential, approaching the issue from a national benefit perspective and within a longer- term transport infrastructure context.

ECVHST Study - Last words in 2001

"……...an EC VHST could have a place in Australia's transport future. The securing of that place, however, would be dependent on whether it can become an integral part of a vision and action plan for a new paradigm of development, mobility and transportation connectivity in the East Coast corridor.

If it does have a place, an EC VHST will not achieve it in the absence of political vision and leadership, long-term bipartisan political commitment, the full participation of all Governments and the collective will and skills of Australians."

Full Report available at:

http://www.infrastructure.gov.au/rail/publications/index.aspx

Japan in 1964
- Key Historical National Priorities

- Reduce energy consumption;
- Lessen dependence on imported oil;
- Create new development centres on a national economic spine;
- Reduce pressures on major cities by long distance work commuting.

France (TGV) 1981

France (TGV)
- Key Historical National Priorities

- Reduce energy consumption;
- Lessen dependence on imported oil;
- Solve lack of capacity between Paris and Lyon;
- Create an export technology.

Germany (ICE) 1991

Germany (ICE) 1991

- Key Historical National Priorities

- Fast Services for Passengers and Freight;
- Land bridging between Eastern and Western Europe;
- Create an integrated capacity in internal mobility and cross border trade;
- Reunification of East and West Germany.

And now?

China's Harmony Express

- Guangzhou(10.33 million) to Wuhan (8.97 million);
- terminus to terminus1023km;
- two 8-car trains each way - non-stop time 3hr8min;
- Average speed 326 km/h;
- limited stop trains - 3 hr42mins to 3hr 56mins;
- fastest top speed in the world of 394km/h.

And now China - Key National Reasons

- To Increase the rail capacity by separating passenger and freight lines;
- Promote regional development;
- Raise current technology standards, catalyze innovation in its industry, export these technologies;
- National integration through the compression of time and space.

Source: Karl Fung Research,2010

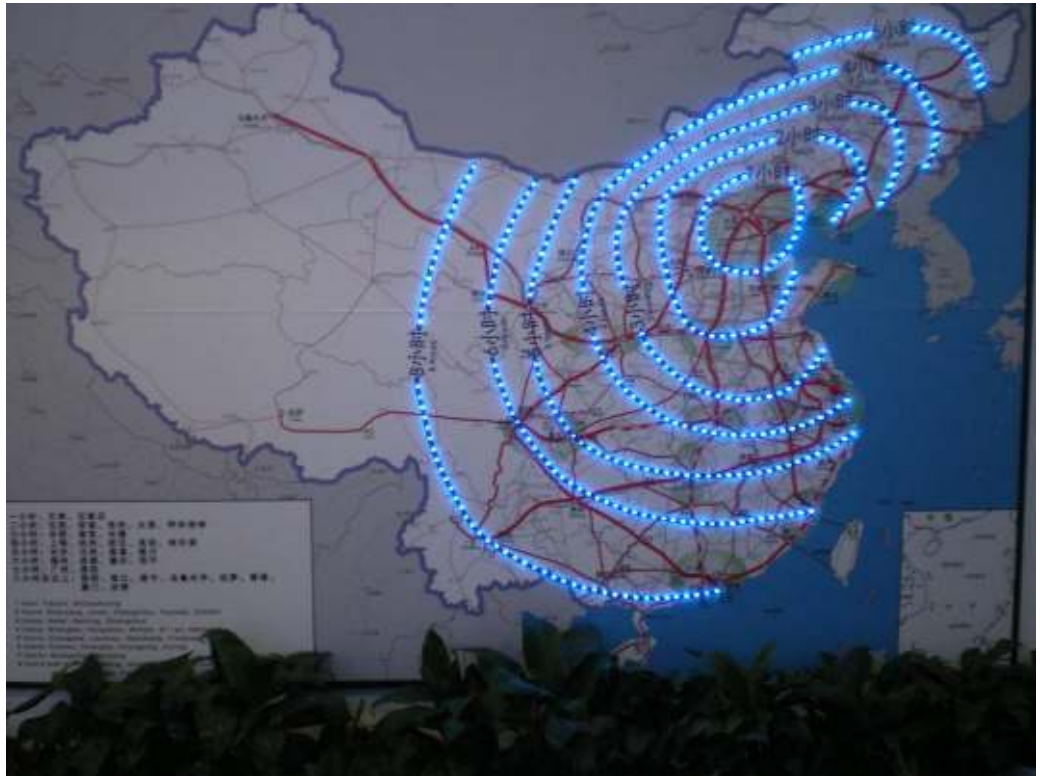
The Central People's Government of the People's Republic of China (2005), 'Mid-to-Long Term Railway Development Plan'

Ministry of Railway, (2008), 'Mid-to-Long Term Railway Development Plan (Revised 2008)

China's Big National Reasons

- To increase the rail capacity by separating passenger and freight lines;
- Promote regional development;
- Raise current technology standards, catalyze innovation in its industry, export these technologies;
- National integration through the compression of time and space.

- 2010 - 7531 kms HSR operational;
- 2010 - 10,000 kms under construction;
- 2012 - 13,000 kms of HSR operational
- 2020 – 16,000 kms and 90% of population



China's Achievements

- Guangzhou(10.33 million) to Wuhan (8.97 million);
- Terminus to terminus =1023km;
- Two 8-car trains each way - non-stop time 3hr8min;
- Average speed 326 km/h;
- Limited stop trains - 3 hr42mins to 3hr 56mins;
- Fastest top speed in the world of 394km/h.

Beijing – Tianjin HST at Beijing South Station

7th World Congress, Beijing

Transportation
Associates

Beijing South Station and Onboard CRH 380

Running at 350 km/h

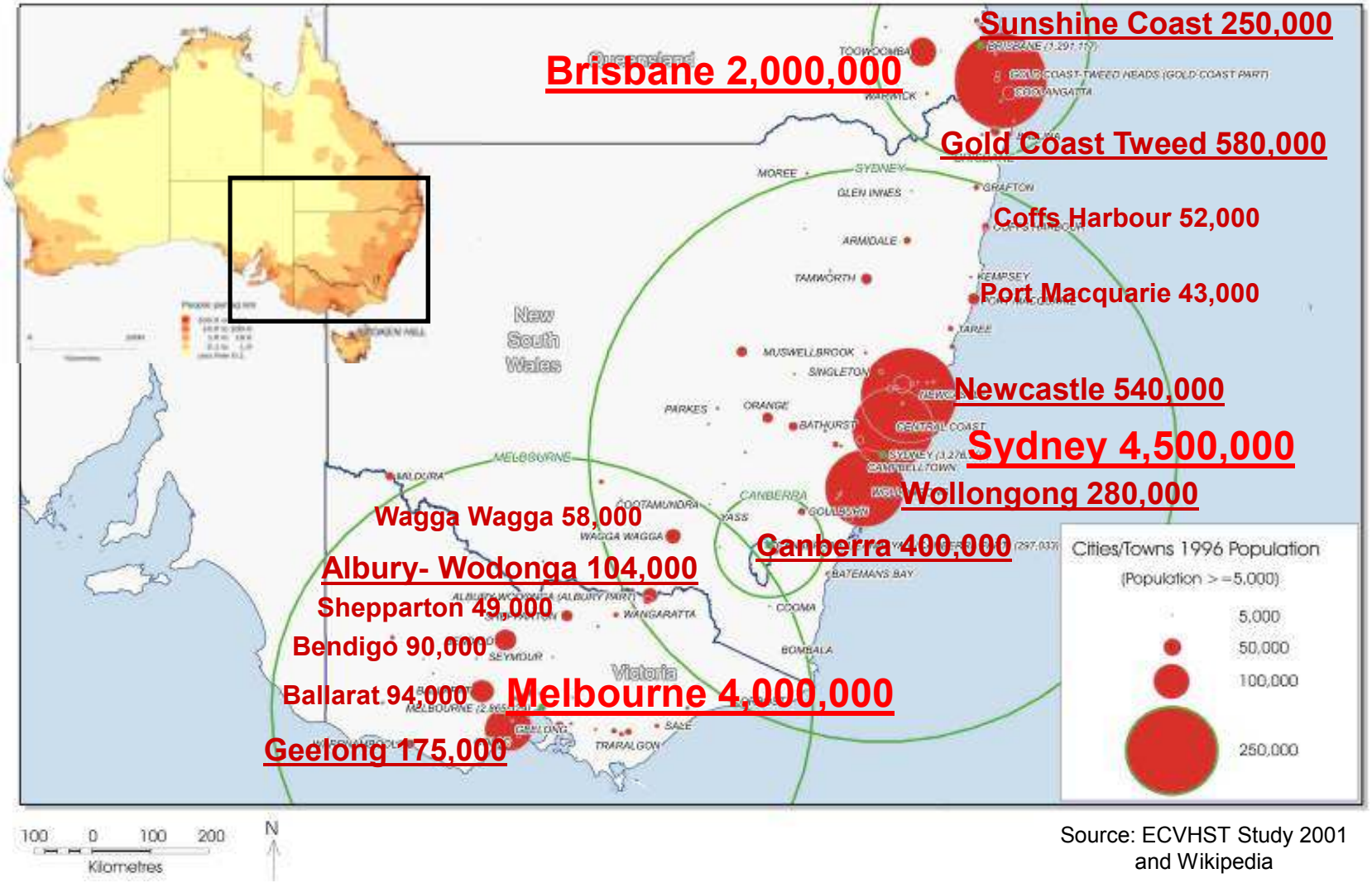
It's not about the technology ....

Source: Peter Thornton

…..Its about Big National Goals

Australian National Flag flying at Parliament House, Canberra Photo: Auspic

East Coast Population Centres

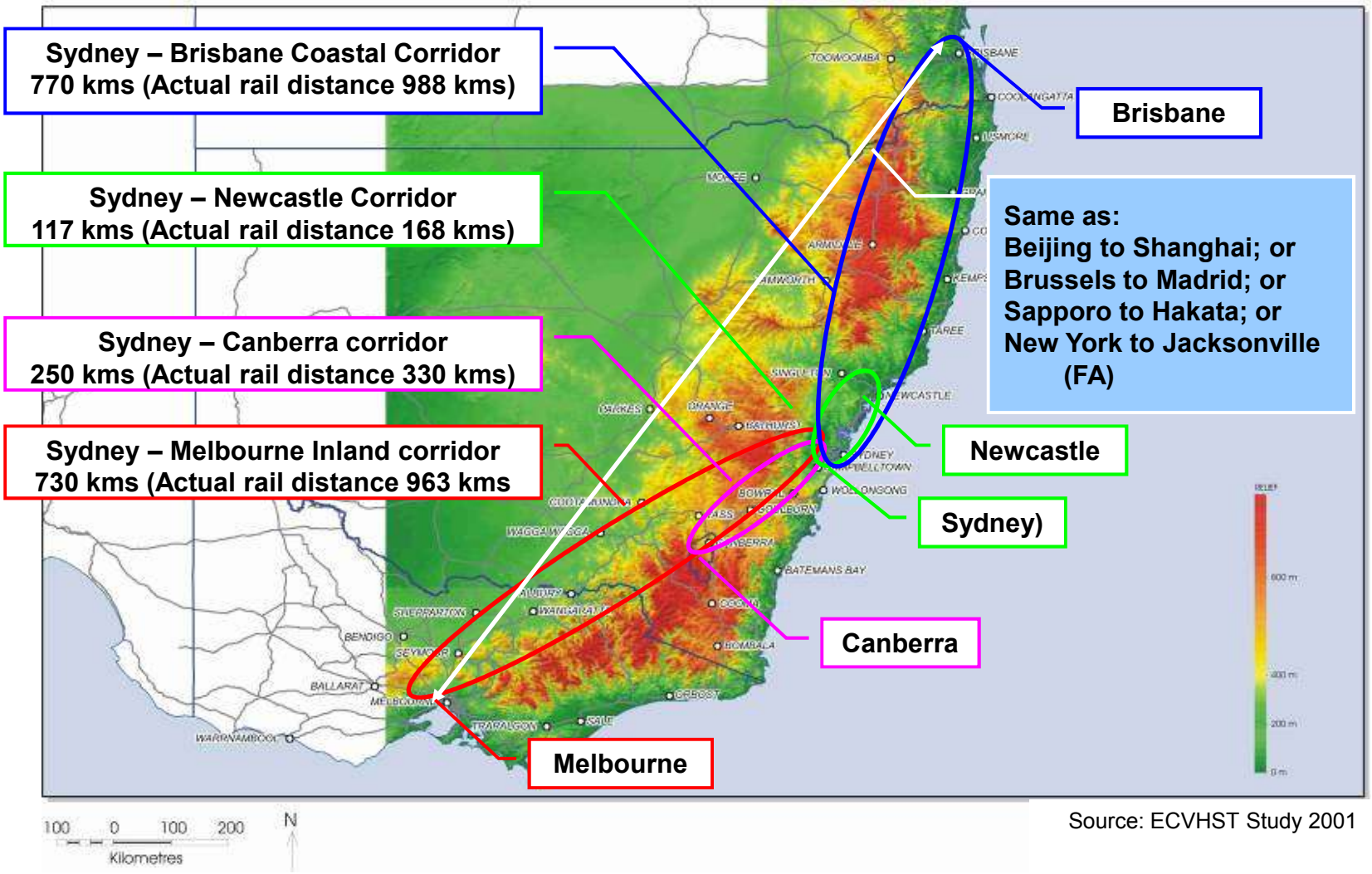


Source: ECVHST Study 2001 and Wikipedia

HSR and Regional Development

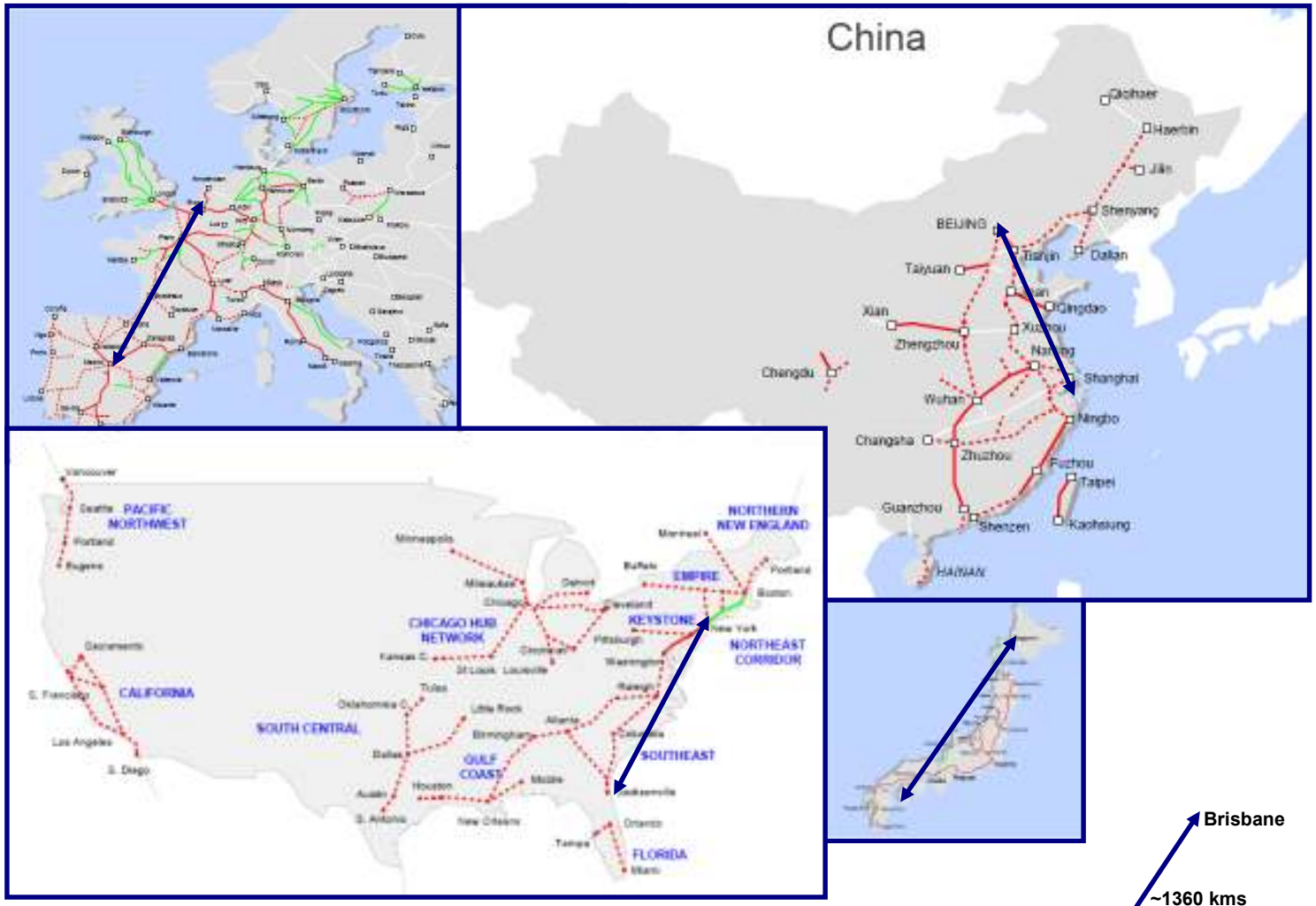
- The World Bank *"High Speed Rail: The Fast Track to Economic Development?"* July 2010
- Lobbying by States *"South Australia should sit up, take notice and claim a seat at the table of the federal inquiry into high-speed rail"*
- Lobbying by cities and towns – The Illawarra Mercury collected 70,000 signatures in support of HST going via Wollongong in the '90s;
- *"Shepparton left behind as report shows faster rate of growth for cities with VLocity trains"*
- *"The indirect effects of a high speed line do not appear automatically,"* Prof E Quinet.

East Coast Geographic Realities



Source: ECVHST Study 2001

Australia In Perspective - Scale



Source: UIC

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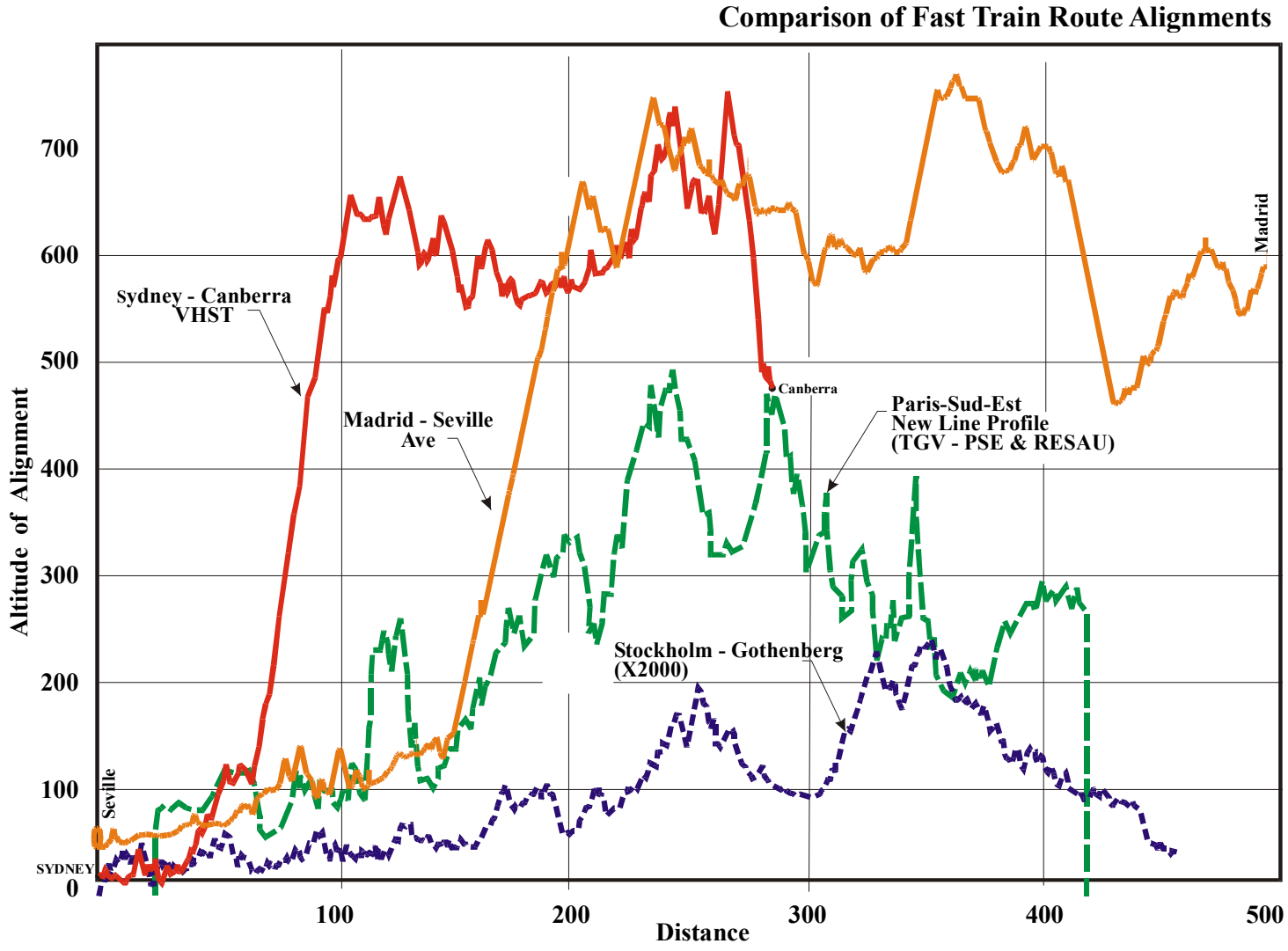
Australia in Perspective
- World's Flattest Continent?



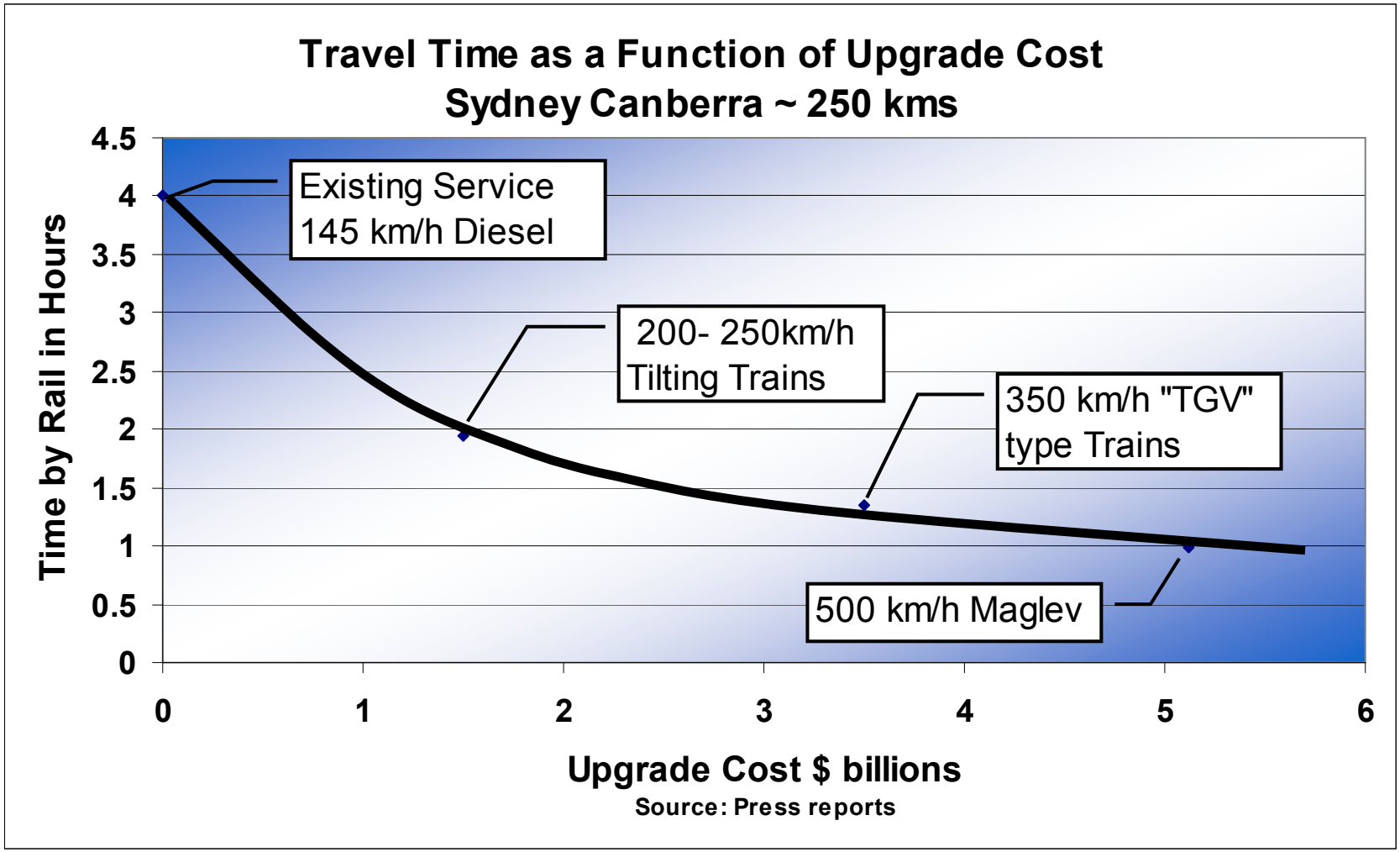
Source: PB Thornton Research 2001

How fast is fast enough?

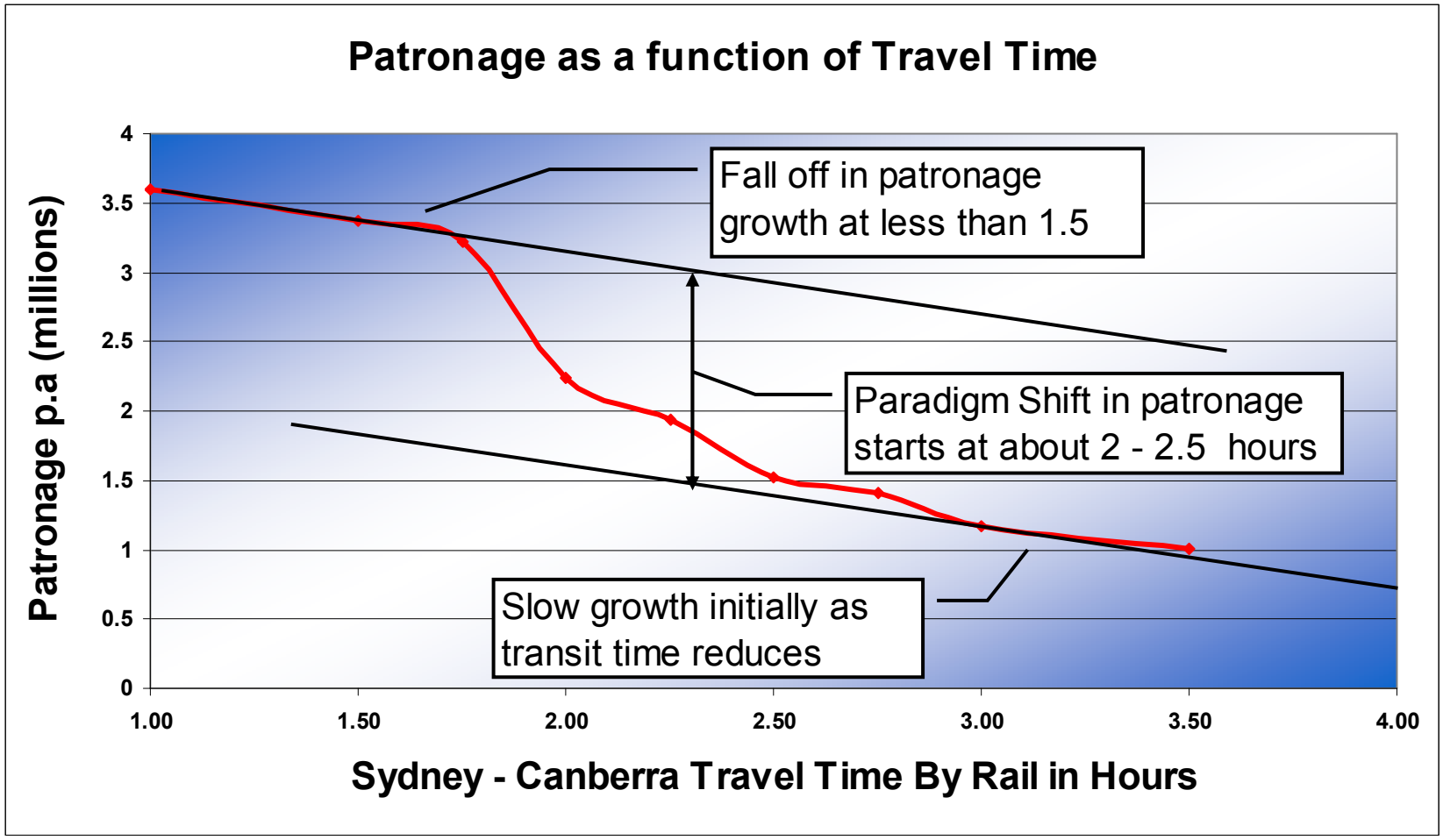
http://www.copyright-free-photos.org.uk/aircraft/5-BA-Concorde.htm

http://www.sydneyairport.com.au/SACL/Photo-Gallery.html

Sydney – Canberra
Cost of Speed Time

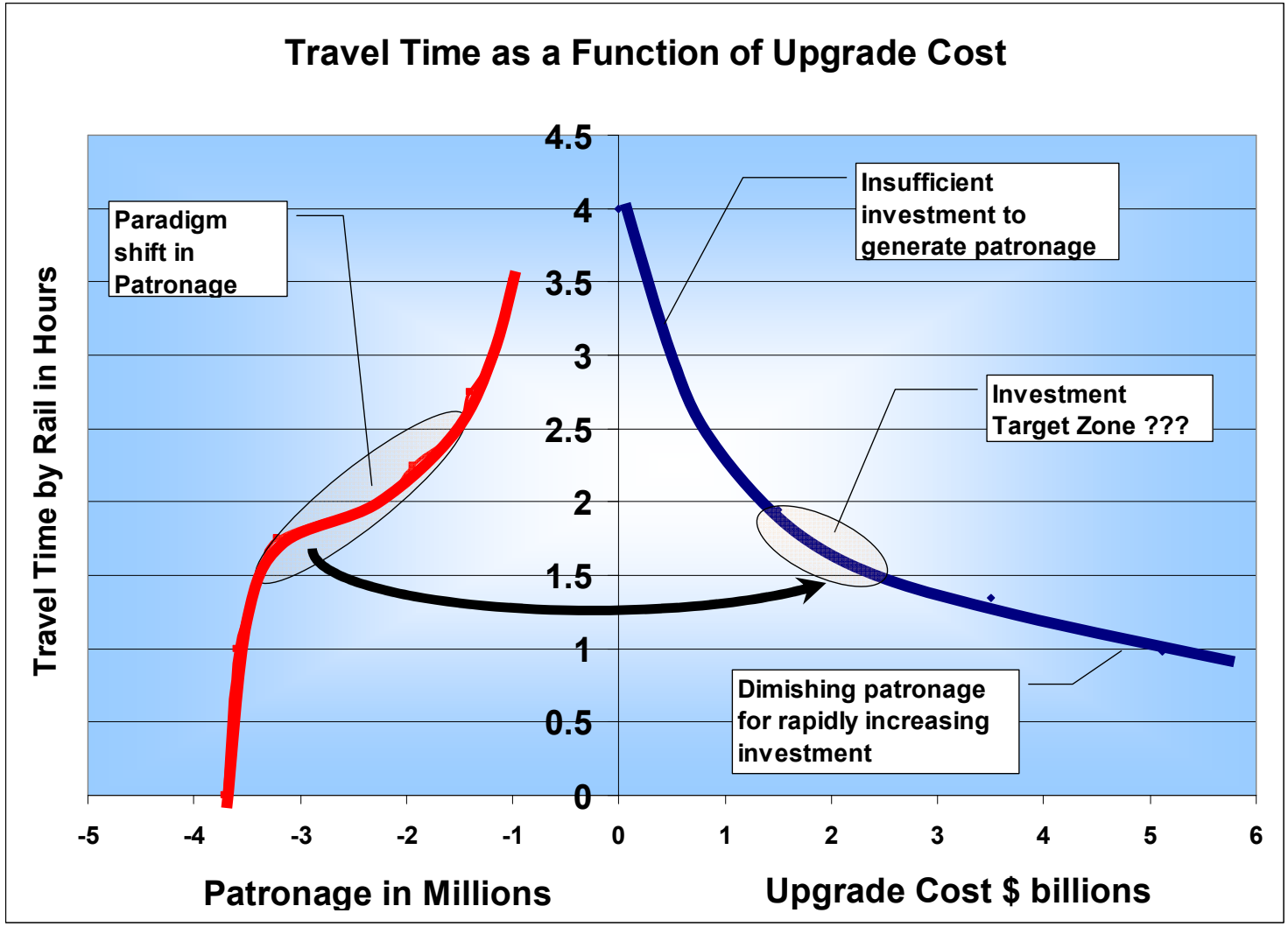


Sydney – Canberra Patronage Response



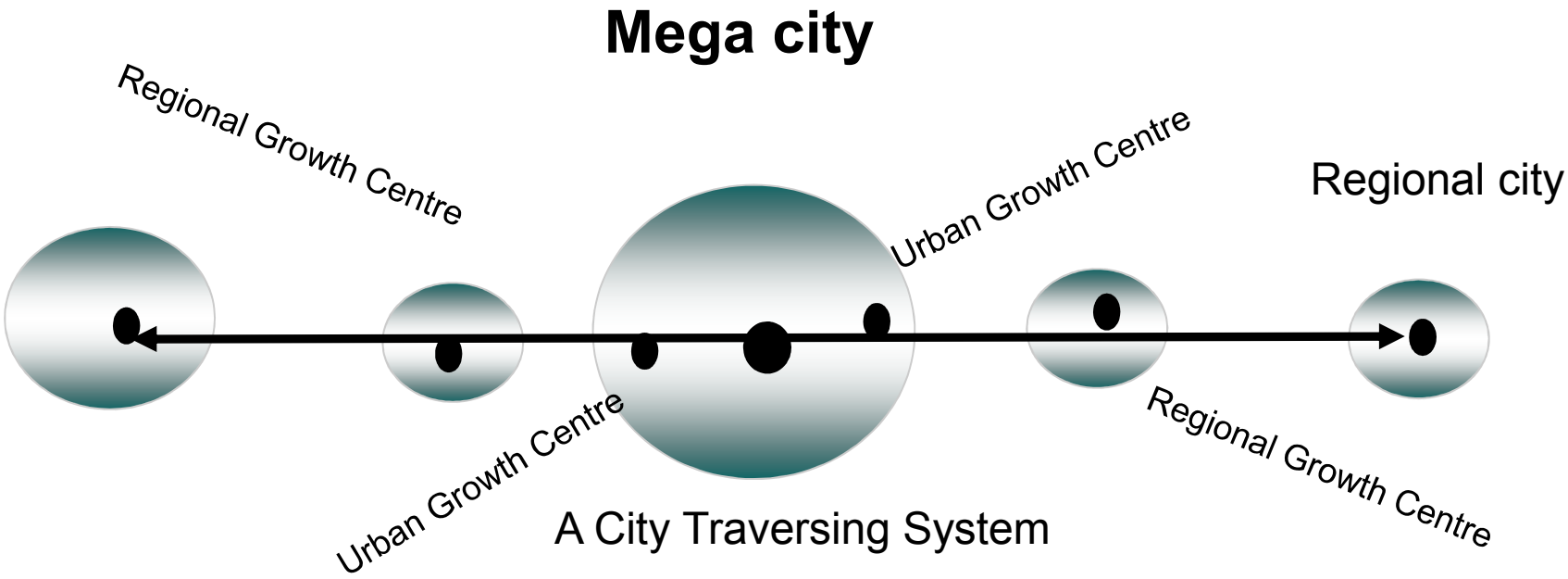
Source : Capital Rail Research

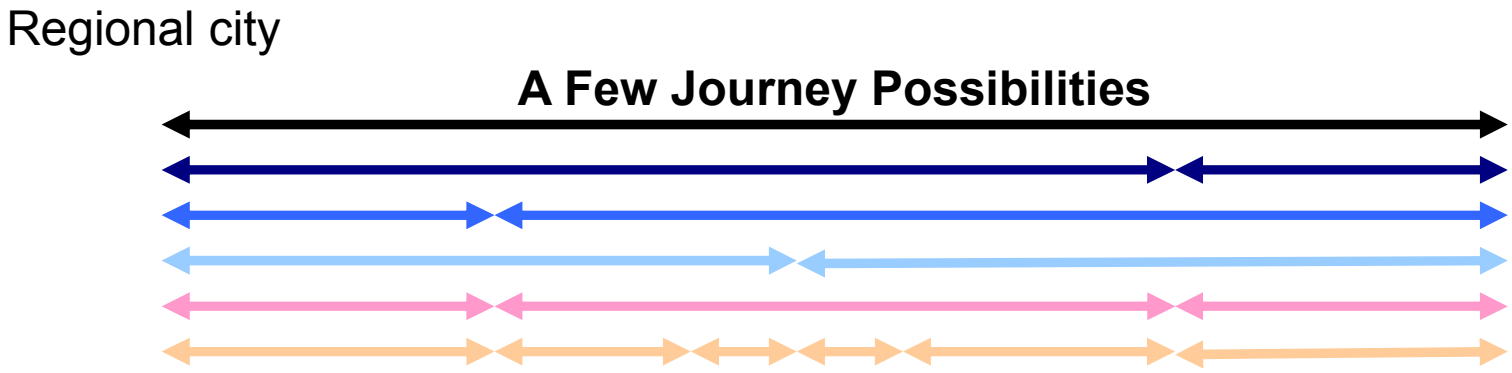
Sydney – Canberra
Investment Sweet Spot?



Source: Capital Rail 1998

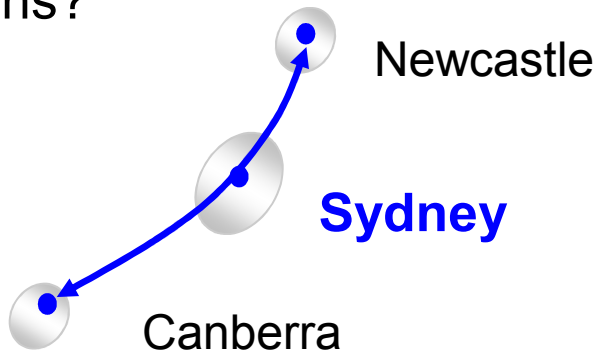
A model for an Australian HST ?

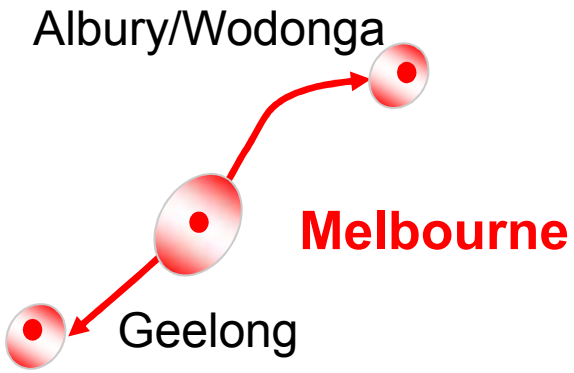




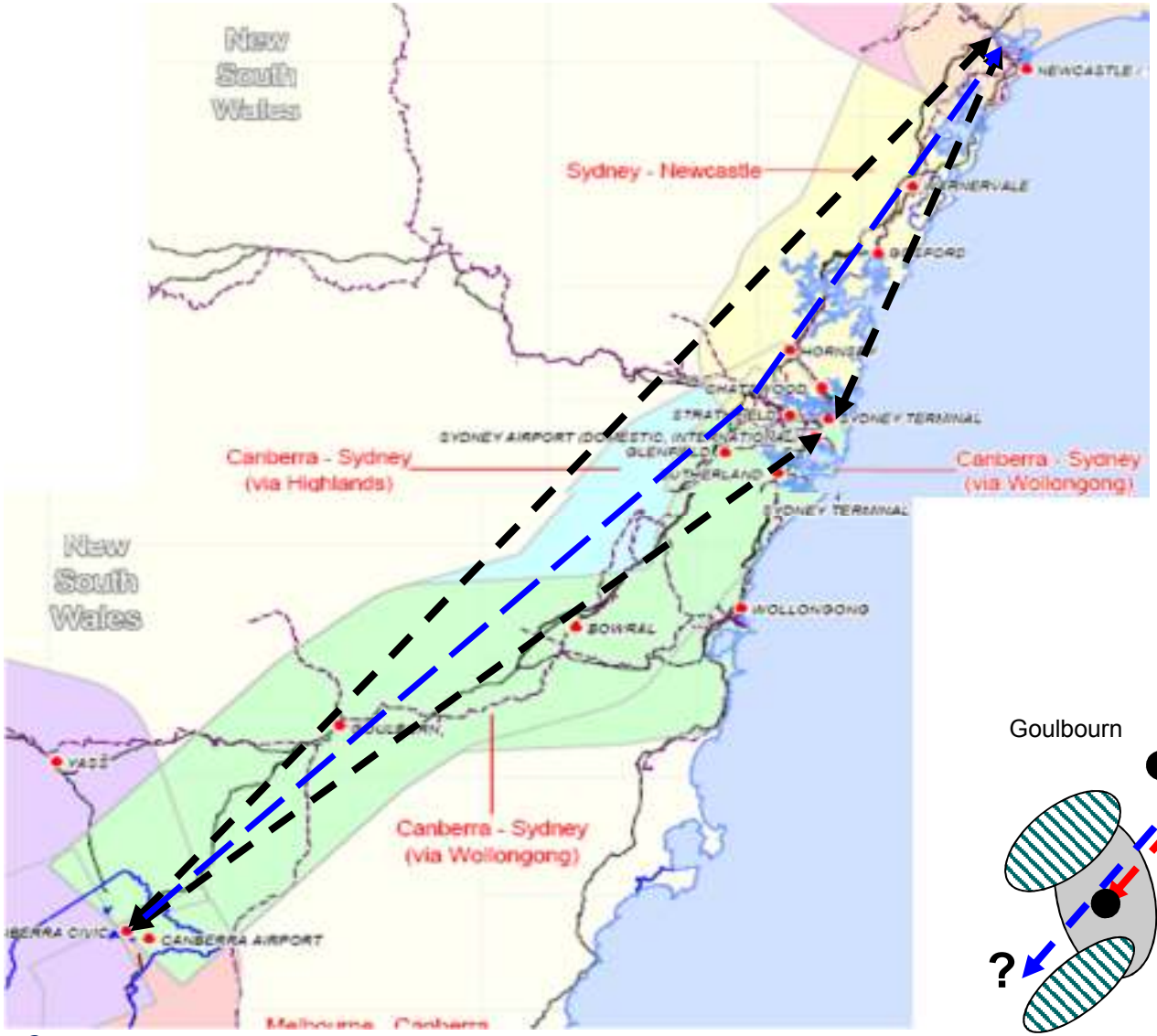
Elements of An Australian HST

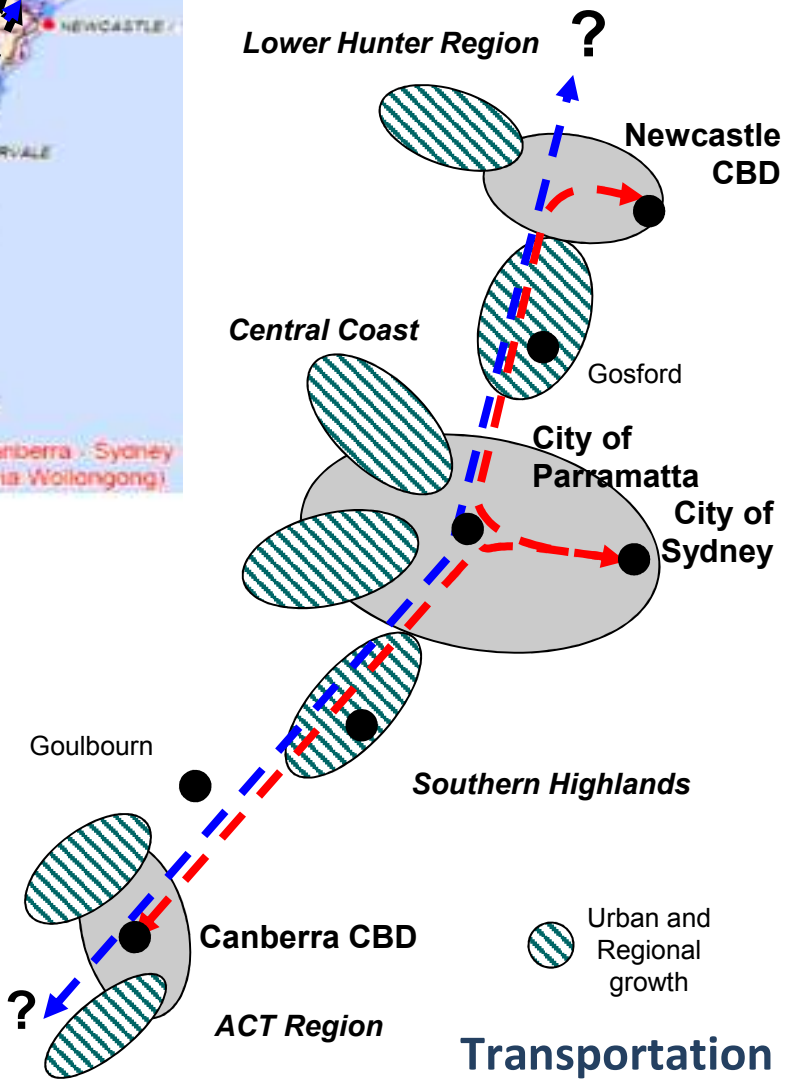
- Where first?;
- Who owns;
- Who pays;
- Who delivers;
- Who operates and maintains?





Newcastle to Sydney and then Canberra?





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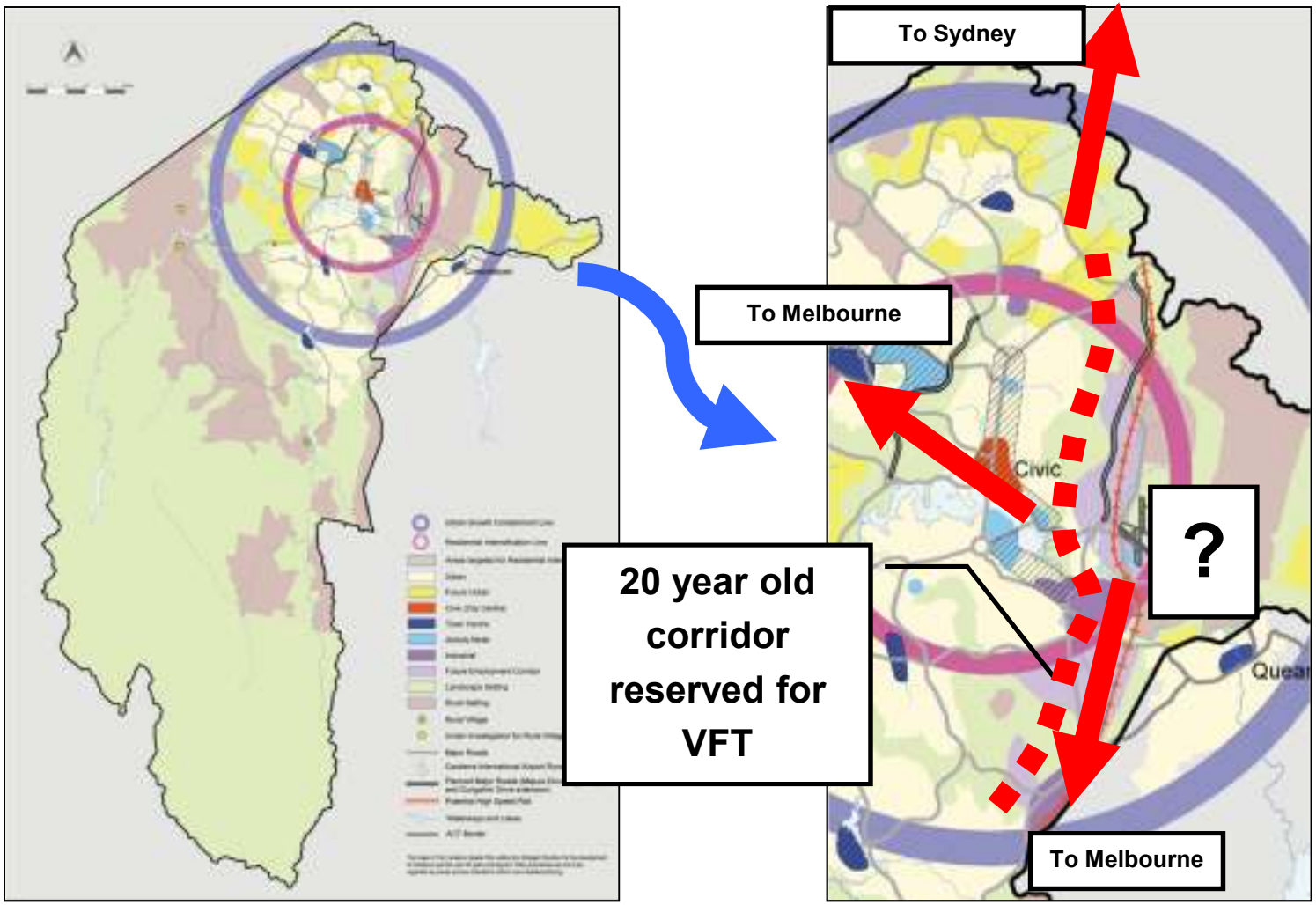
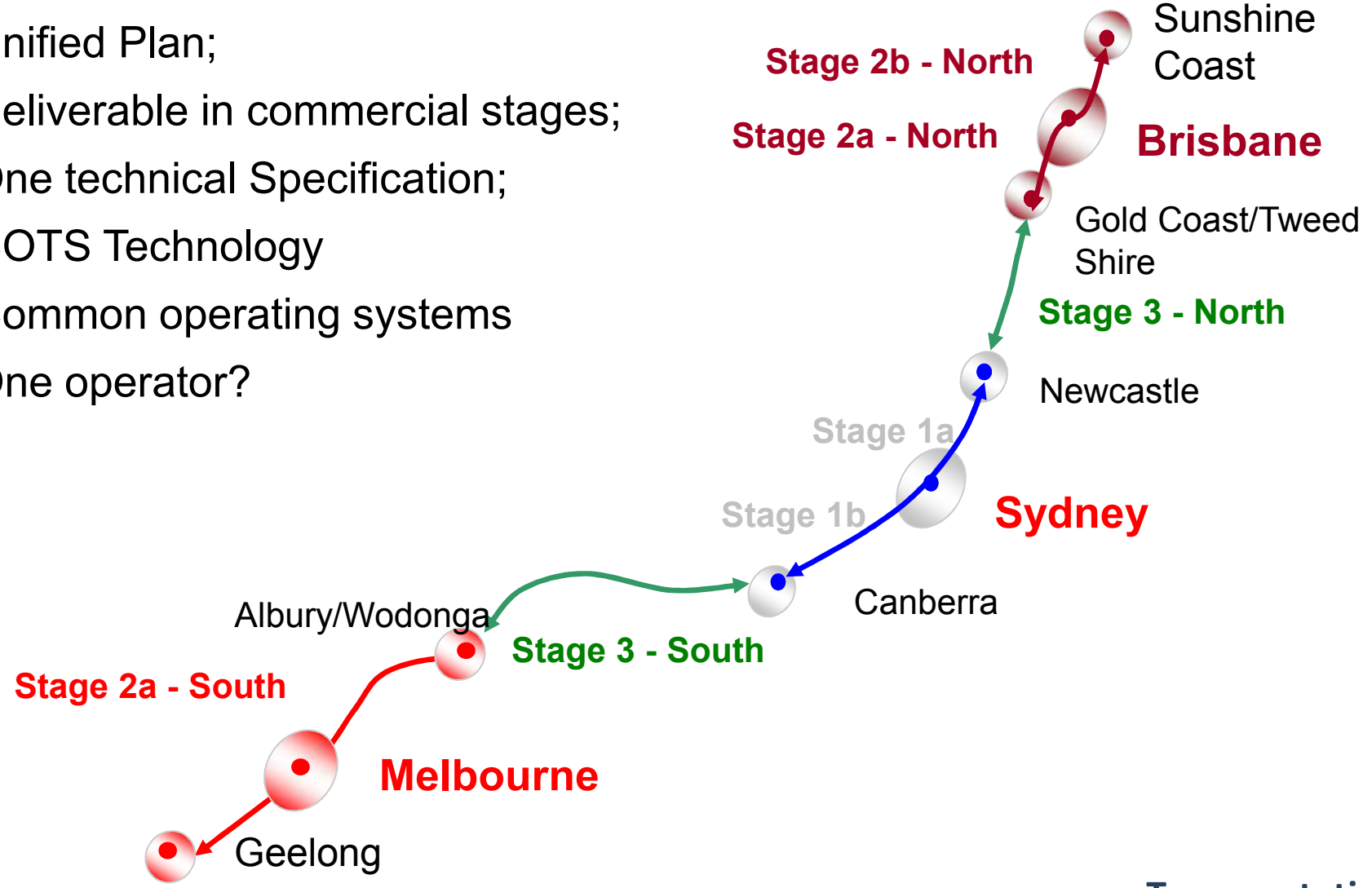
Canberra – which way next?



Delivery Staging for An Australian HST

- Unified Plan;
- Deliverable in commercial stages;
- One technical Specification;
- COTS Technology
- Common operating systems
- One operator?



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Case Study – Sydney - Newcastle

Newcastle

- Regional population 0.54 million
- Largest coal export port in the world

Sydney

- Metropolitan population 4.5 million
- Largest city in Australia

As the crow flies =117 kms CBD to CBD
(Beijing – Tianjin = 120 kms in 30 minutes)

CBD to CBD

Rail - 168 kms 2hrs 45mins ($15.60 rtn);

Road -164 kms; 2hrs 20mins

Air - 45mins plus 56mins ground access; ($166 rtn);

Source: Hamilton Lund & Tourism NSW

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Case Study – Sydney - Newcastle

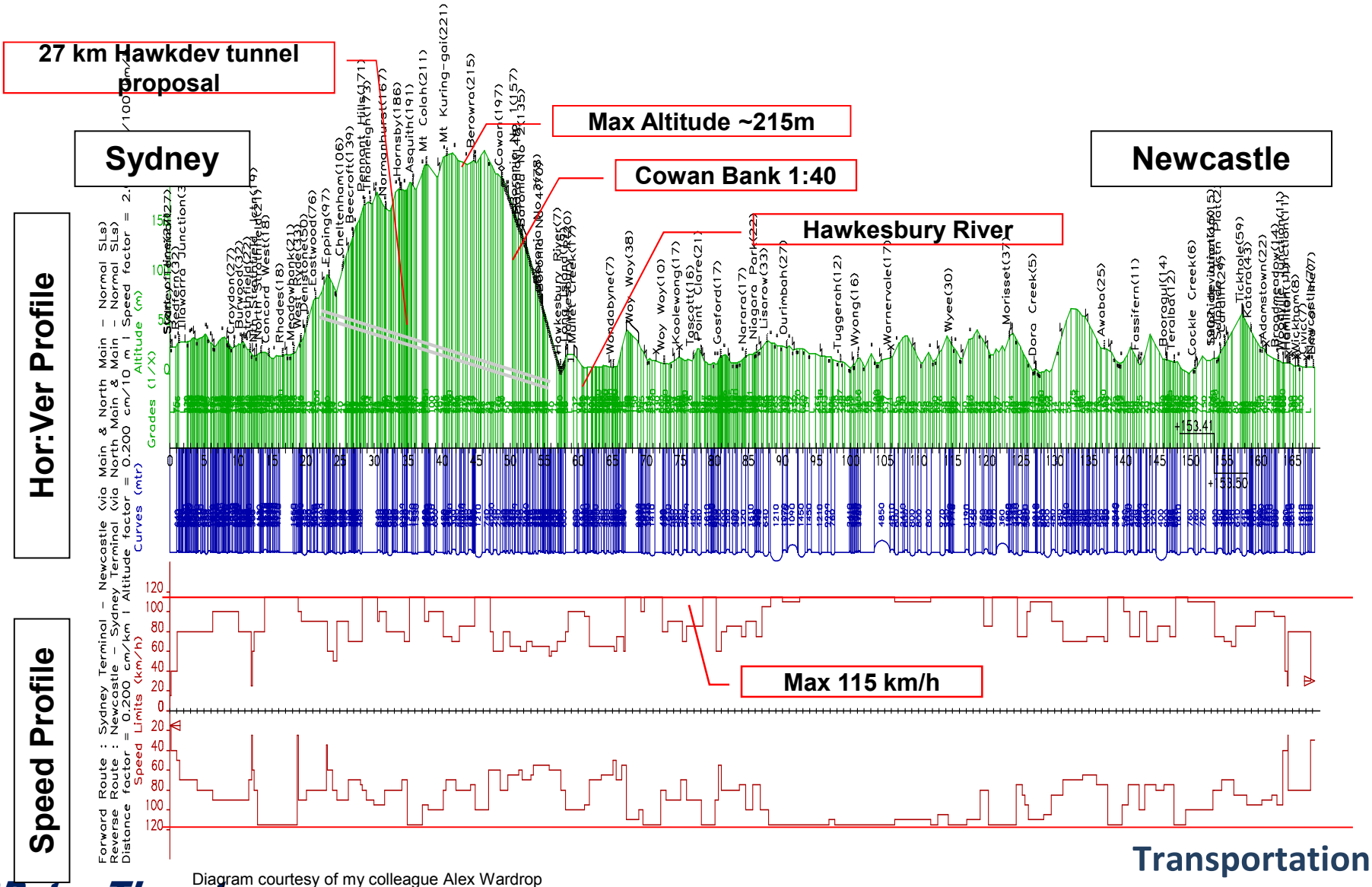


Diagram courtesy of my colleague Alex Wardrop

Case Study – Sydney - Newcastle

All stops Inner Suburban
Tight curves / steep grades

Limited stops Outer Suburban
Urban environment

Limited Stops Interurban
Many stations

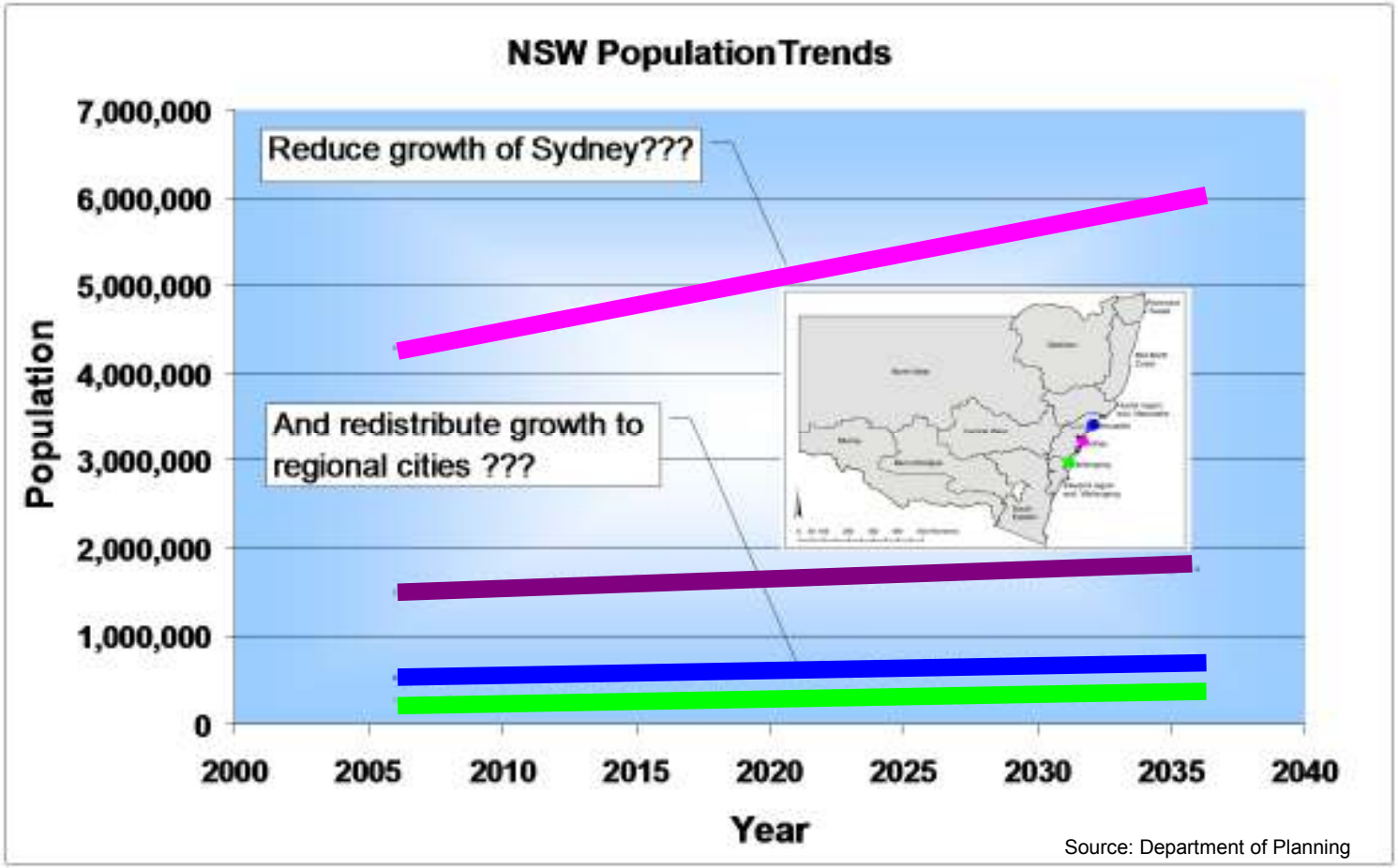
Bulk materials
Level crossings

Long Distance passenger
160km/h diesel hauled

Intermodal/General Freight
Old locos back in service

All photos Courtesy of my colleague Alex Wardop

Case Study – Sydney - Newcastle



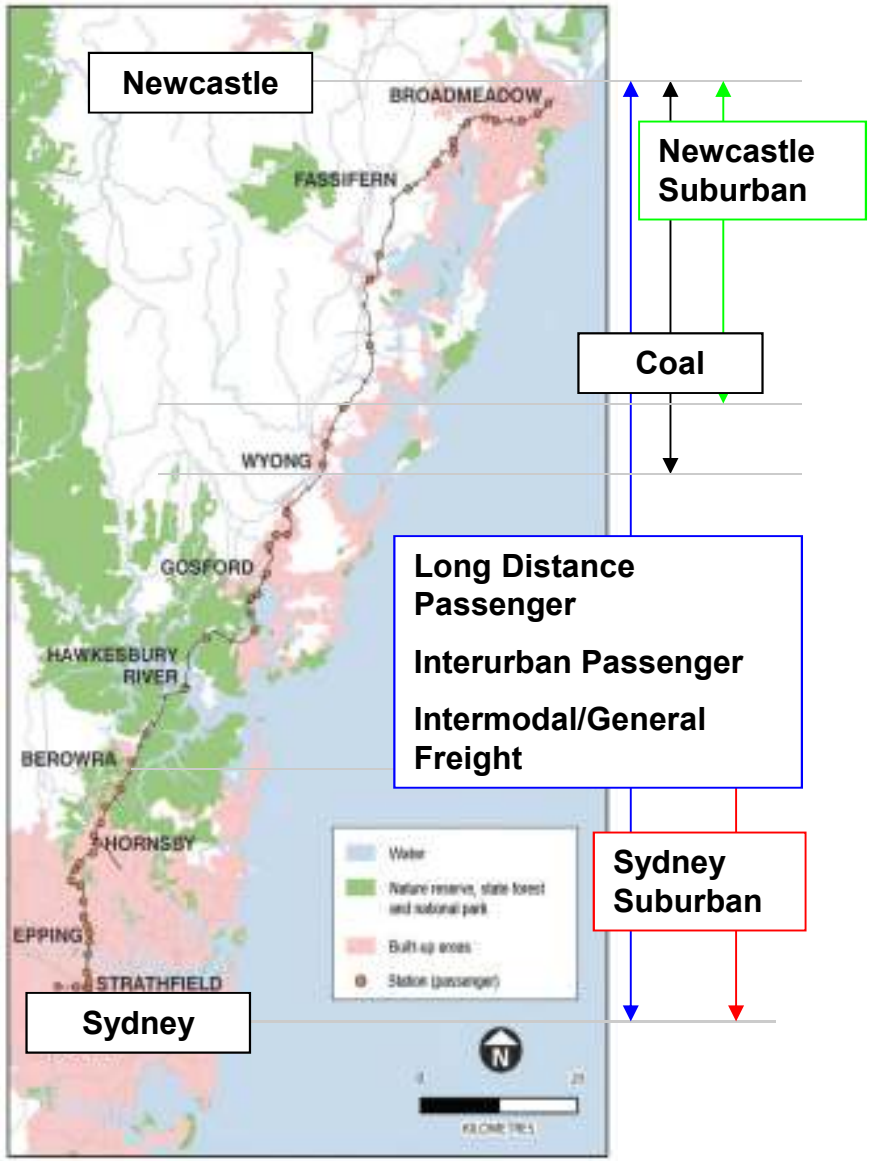
Case Study – Sydney - Newcastle

Central Coast by 2031

- 100,000 more people to +400,000
- But >65 yr olds >24%
- 56,000 new jobs
- 7 town centres, 1 regional city – Gosford
- No new transport corridors currently
- 25% commuting out
- Any commuting in?
- Will they pay a commercial fare???

http://www.planning.nsw.gov.au/StrategicPlanning/Regionalplanning/CentralCoastRegion/tabid/186/language/en-AU/Default.aspx

Case Study – Sydney - Newcastle



- Part of heaviest freight and commuter corridor in Australia
- Multiuser Corridor: 4 basic sectors;
- Passengers – ~ 36000 all day e/w
- Freight – Practical capacity 16 paths per day e/w; Excluded from passenger peak hours;
- 168 kms long ; 1 in 40 grades;
- Minimum Curvature 240 m;
- 8 tunnels - 3.8 km in length
- 1500V dc electrified;
- Mostly double track with short sections of triple and quad;
- 52 Stations.

Case Study – Sydney - Newcastle

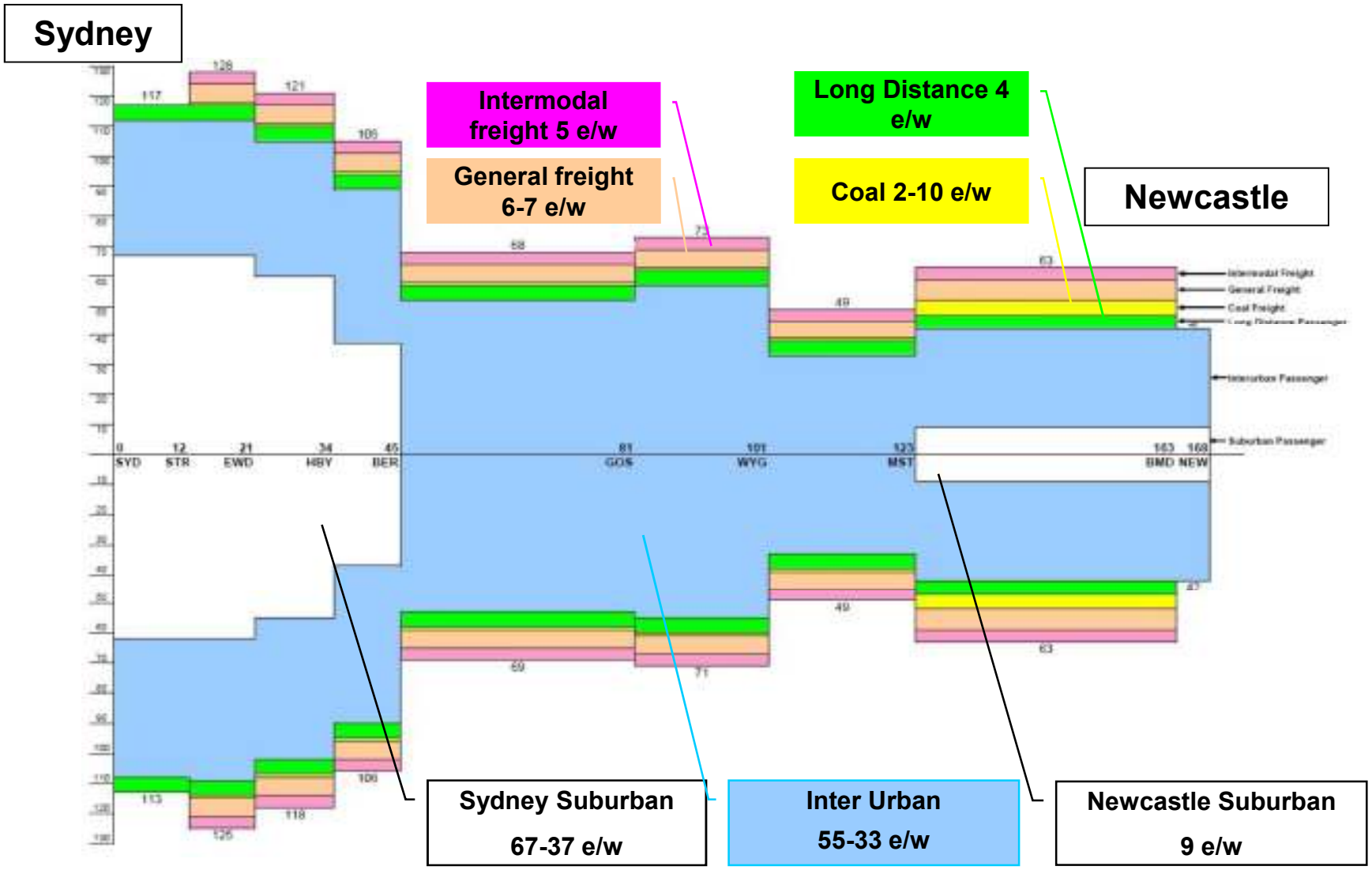


Diagram courtesy of my colleague Alex Wardrop

Case Study – Sydney - Newcastle

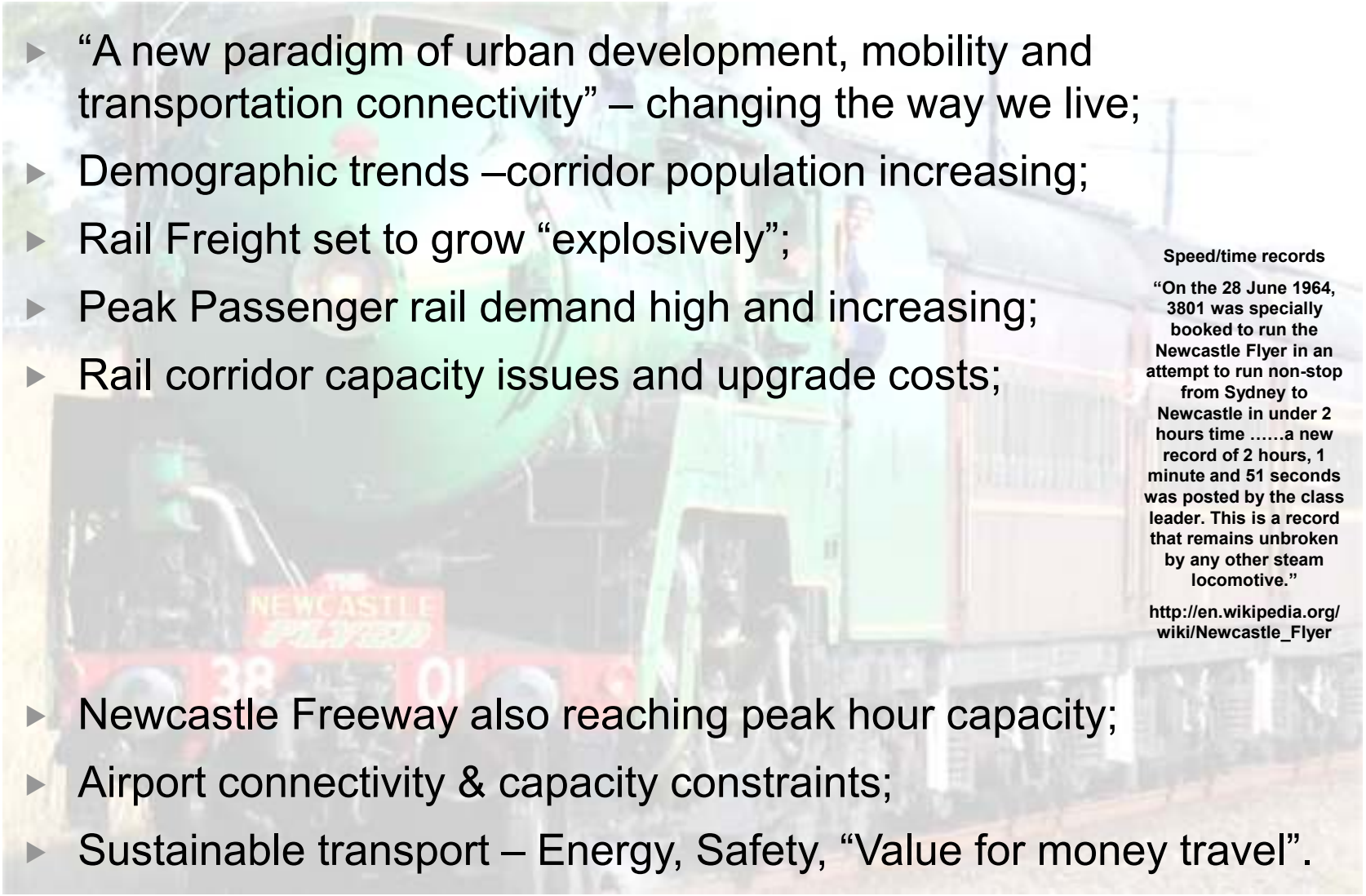
Source: Tourism NSW

Case Study – Sydney - Newcastle

Source: Hamilton Lund & Tourism NSW

Case Study – Sydney - Newcastle

- "A new paradigm of urban development, mobility and transportation connectivity" – changing the way we live;
- Demographic trends –corridor population increasing;
- Rail Freight set to grow "explosively";
- Peak Passenger rail demand high and increasing;
- Rail corridor capacity issues and upgrade costs;



Speed/time records

"On the 28 June 1964, 3801 was specially booked to run the Newcastle Flyer in an attempt to run non-stop from Sydney to Newcastle in under 2 hours time ……a new record of 2 hours, 1 minute and 51 seconds was posted by the class leader. This is a record that remains unbroken by any other steam locomotive."

http://en.wikipedia.org/wiki/Newcastle_Flyer

- Newcastle Freeway also reaching peak hour capacity;
- Airport connectivity & capacity constraints;
- Sustainable transport – Energy, Safety, "Value for money travel".

Phase 2 HSR Study Conclusions

- 1748 kms dedicated route – Melb-Can-Syd-Bris; 20 stations;
- Mix of express and limited stops services;
- Connectivity to other transport systems;
- 2012 $ 114 billion - Melb-Syd $50b; Syd-Bris $64b;
- 46m -111m pax intercity & regional trips central forecast - 83.6m pax pa; 40% of the intercity air travel market; Syd – Mel 19 m pax pa
- Staging – Syd- Can; Can- Mel; Syd- New; Bris-Gold; Gold- New; Syd-Mel = operational by 2035?
- Govt required to fund upfront infrastructure costs;
- Funding gap of 86% if commercial funding maximized;
- If pax forecast achieved, above rail operation self funding – if fares comparable to airfares
- Economic BCR 2.3 to 2.5 at 4% discount rate
- FIRR 0.8 – 1. and EIRR 7.8%

So where are we at?

- Government commitment; ✓
- New HSR Study Completed ✓
- Confirm “Big National Reasons”; ?
- Successful 1st Stage; ?
- Define next stages of an East Coast HST; ?
- Corridors reservations now - city entries and exits; ?
- Create defendable zonings; ?
- Create an HSR business NOT an HSR construction project; ?
- ***"the big difference between Spain and other European countries is that the others plan services while we just plan spending."***

Http://www.Coshoctontribune.Com/article/20110206/OPINION02/102060311/1014/OPINION/the-spanish-example-warning

Keeping an open mind on the subject

Is there light at the end of the HSR tunnel?!