CANBERRA
BUSINESS COUNCIL

High Speed Rail for Australia
An opportunity for the 21st century

A submission by the
Canberra Business Council

Committed to the Growth and Development of Canberra and the Capital Region

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What is high speed rail?

High speed rail refers to passenger trains travelling at 250km/h or more, on purpose-built tracks. Among the best known examples are the Japanese Shinkansen or bullet trains, the French TGV (Train à Grande Vitesse) and the German ICE (Inter-City Express).

The typical operating speed of high speed trains has increased to 300km/h, and speeds of 350-360km/h are in prospect.

The energy required for operation at such speeds means that high speed trains are invariably powered by electricity.

Although high speed rail systems are focused primarily on the movement of people, they are being used increasingly for freight, and this will grow in the future.

High speed rail has an outstanding safety record. Since the start of operations in Japan in 1964, there has not been a single fatality nor a serious injury in an accident on a high speed line.

High speed rail around the world

Apart from the early users such as Japan, France and Germany, high speed rail lines are now being extended, built or developed in many countries across the world.

Countries which are extending their existing networks include Belgium, France, Germany, Italy, Spain, Switzerland, Japan and South Korea.

New systems are under construction or being planned in The Netherlands, Poland, Portugal, Russia, Sweden, Vietnam, China, India, Iran, Saudi Arabia, Turkey, Morocco, Argentina and the USA (in California).

High speed rail is not challenged by low cost airlines. In France, for example, high speed trains are described as “the low cost carrier”.

A table is attached from *Railway Gazette International* listing high speed rail lines in operation or under construction (but excluding others being planned).

Previous Australian proposals for high speed rail

Plans for high speed rail in eastern Australia stopped in 2000 when the then government and the Speedrail consortium could not agree on the level of government financial support required for the Sydney-Canberra Speedrail project. The proponents had seen this as the first step in a possible Melbourne-Canberra-Sydney-Brisbane network.

Earlier, the VFT consortium had pursued a Melbourne-Sydney project. Developed between 1984 and 1991, this proposal ended for a similar reason, when the federal government did not agree to the tax provisions put forward by the proponents.

Effectively both these previous projects did not come to fruition because of a failure on the part of governments and the proponents to establish and agree at the outset what their respective financial commitments should be.

Why Australia should look again at high speed rail

Since the ending of Australia’s last high speed rail project in 2000, many changes have occurred which suggest that this form of transport should be re-examined. This section discusses reasons why high speed rail should be reconsidered for Australia.

Changes in high speed rail technology, competitiveness and supply over the past decade

Speeds are increasing. A record of 575km/h was set by a French TGV in April 2007. This speed was achieved by a train which could operate on the tracks of the Sydney metropolitan network – necessarily at much lower speeds.

Commercial speeds have increased. Trains in France now run routinely at 320km/h. On the recently-opened line from Madrid to Barcelona an operating speed of 350km/h is expected. Plans are being made in France to lift everyday speed to 360km/h.

These speed increases, together with increasing congestion at airports and longer processing times for travellers as a result of security measures, mean that high speed rail is competitive for longer journeys than before. Previously, a journey time of three hours by rail was considered the upper limit in competitive terms. Now, experience in France is that, of rail+air travel, high speed rail captures 90% market share for rail journeys of two hours; 66% at three hours; and 45% at four hours. For leisure travel, high speed rail attracts a significant market share on journeys up to six hours.

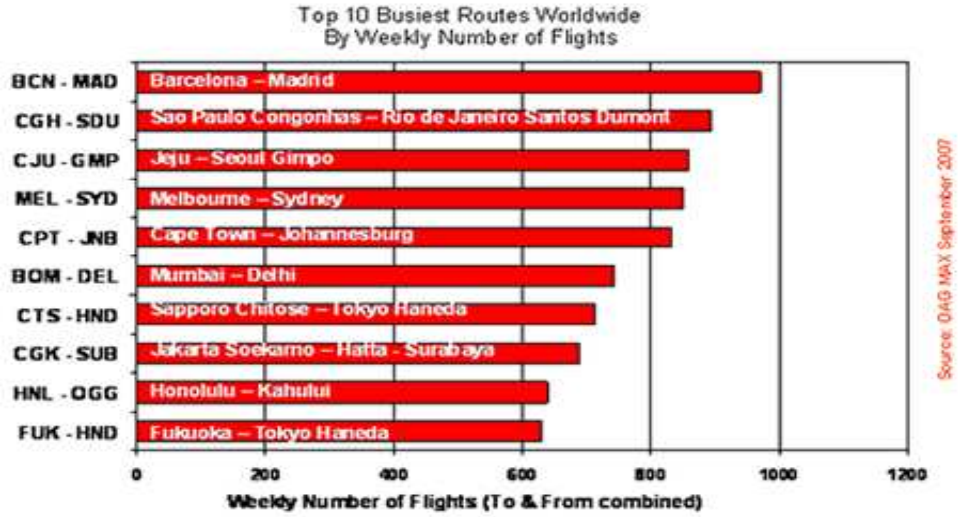
More suppliers of high speed train technology have entered the market, adding to competition and lowering costs. The list of manufacturers currently includes Alstom (France); Siemens (Germany); AnsaldoBreda (Italy); Talgo (Spain); Rotem (Korea); Hitachi, Kawasaki and others (Japan); and Bombardier (international).

Travel demand on the east coast

It is sometimes claimed that Australia "does not have the population for high speed trains". Such a statement is irrelevant: what matters is travel on specific routes.

Sydney - Melbourne has the fourth busiest air service in the world, with some 70 flights each way per day between the two cities. The only busier routes are between Madrid and Barcelona, Sao Paulo and Rio de Janeiro, and Jeju and Seoul.

The ranking of the world's busiest air routes as at September 2007 is shown in the following table.



Source: OAG (Official Airline Guide) – see http://www.oag.com/oag/website/com/OAG+Data/News/Press+Room/Press+Releases+2007/OAG+reveals+latest+industry+intelligence+on+the+busiest+routes+2109072

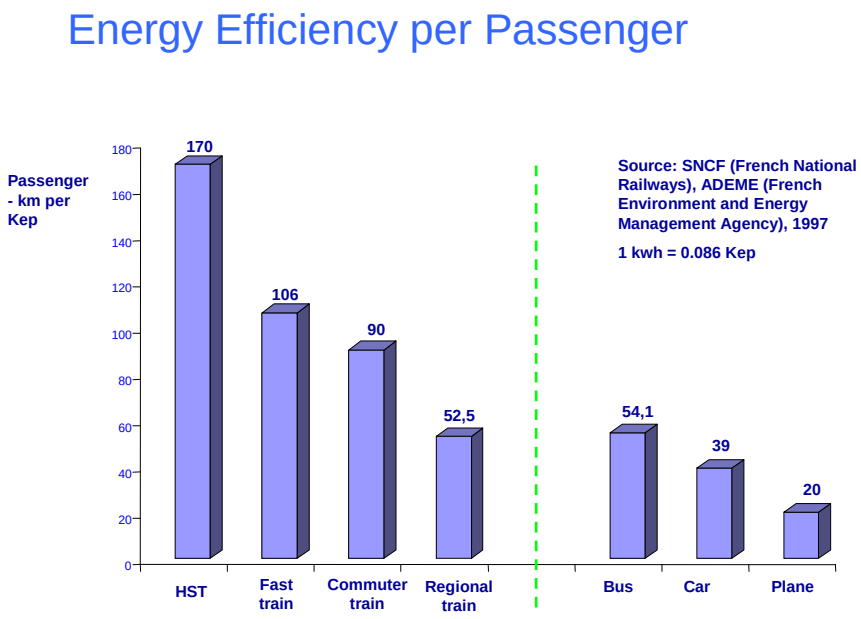
Sydney-Brisbane is also a busy air route, ranking seventh in the Asia-Pacific region. In the same corridor, travel between Sydney and the Gold Coast could be added to the Sydney-Brisbane figure.

The level of travel on these routes is a clear indication of the potential for the use of high speed rail in Australia. A route which linked Melbourne and Sydney via Canberra, and Sydney and Brisbane via Newcastle and the Gold Coast; would link these major cities but further, through the provision of additional 'stopping' trains, would serve regional centres such as Benalla, Albury/Wodonga, Wagga Wagga, Goulburn, the NSW Central Coast, Taree, Coffs Harbour and Grafton.

Energy efficiency

Since 2000 when high speed rail development ceased in Australia, the price of energy has risen sharply and these increases show no sign of abating.

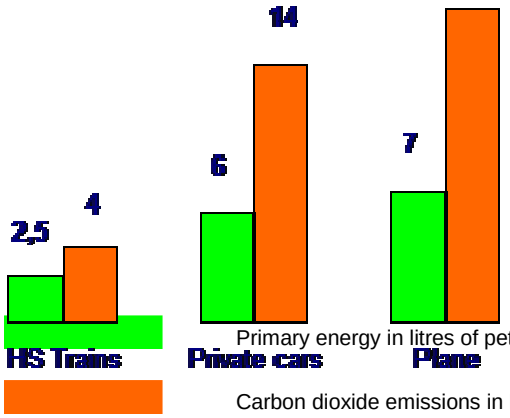
High speed rail is more efficient in its use of energy than competing modes of transport, as shown in the following diagram:



Climate change

Climate change is a major issue across the globe. High speed rail compares very well with competing modes in terms of carbon dioxide emissions, as shown in the following diagram, which also shows a comparison of primary energy use.

Carbon dioxide emissions and energy use



Primary energy in litres of petrol per 100 passenger-km

Carbon dioxide emissions in kilograms per 100 passenger-km

The carbon dioxide emission figures in this diagram are based on the situation in Europe: Australia's near-total reliance on coal for the generation of electricity would suggest that emissions by high speed trains in Australia would be higher than shown. However, being electrically powered, high speed trains have the potential to draw their energy from renewable sources. For example, Belgium is to build 20 wind generators alongside its second high speed line. They will produce more than the energy requirement for that section of line.

Use for freight

As indicated above, high speed rail systems are focused on the movement of people. However they are also being used increasingly for freight. This ranges from use of the high speed tracks by conventional freight trains, where gradients permit (in Germany and Italy, for example), to the operation of dedicated freight trains at the same speed as passenger trains. The latter is the case with the postal TGV trains in France. This activity is soon to be substantially increased as the first step in an initiative entitled Cargo Rail Express which will see a major expansion of high speed freight services in Europe.

Partners in this project, which is included in the European Union Logistics Action Plan, include Paris Charles de Gaulle airport, Amsterdam Schipol airport, FedEx, TNT and the French National railways; see http://www.spiegel.de/international/business/0,1518,534978,00.html

High speed freight: a postal train running at up to 300km/h in France. Photo: *Olivier Julian*

An Australian high speed rail network could carry freight on either of these two bases (i.e. use of the tracks by conventional freight trains or by high speed freight trains); or the high speed alignment could provide, again where gradients permit, a route for an independent freight track, improving existing main lines by reducing their length and curvature.

The opportunity for Australia

Developments over the past decade suggest that it is time Australia took another look at high speed rail. Trains are becoming faster, making routes such as Melbourne-Sydney and Sydney-Brisbane, each with three hour travel times, well within the competitive distance for high speed rail.

The demand for travel between Melbourne and Sydney – the world's fourth busiest air route; and between Sydney and Brisbane, seventh busiest in the Asia/Pacific region – suggest that a high speed rail service would be well used. In addition, regional centres would benefit from better access to capital cities.

High speed rail would mean that travel on these routes would be undertaken in a much more energy-efficient way than at present.

Perhaps most important, that travel would be undertaken in a more climate-friendly way that greatly reduces carbon dioxide emissions compared with alternative modes.

The prospect that a high speed rail system could carry freight is another significant potential benefit.

Next steps

The Government has already indicated that high speed rail will be considered by the new entity Infrastructure Australia. Based on the growth in high speed rail around the world, the lack of such a system in Australia represents a significant deficiency in the nation's infrastructure.

Beyond the audit to be conducted by Infrastructure Australia, the organisations which have compiled this submission recommend that the Government should go further.
There is no point in undertaking yet another feasibility study. High speed rail has been studied in Australia since 1984.

It is recommended that the Government should adopt a policy position that high speed rail has a role to play in Australia's transport in the future, on a route from Melbourne to Sydney via Canberra, and from Sydney to Brisbane via Newcastle and the Gold Coast.

Such a network will have a multi-billion dollar capital cost, but if developed in stages would be well within the financial and budgetary capacities of Australia, on the assumption that the cost is shared between the public and private sectors. The popularity and success of high speed rail overseas indicates its ability to generate both financial and economic – and not least, environmental – benefits.

The next step should be a scoping study to consider and examine:

- The most appropriate staging of high speed rail on the Melbourne/Canberra/Sydney/Newcastle/Brisbane corridor;

- Financing options including the roles of the public and private sectors. As stated earlier, high speed rail stalled in Australia because there was not a clear understanding between the public and private sectors on what their respective funding contributions should be. The range of financing models used overseas should be examined;

- Structuring options: a range of approaches is available, including awarding a build-and-operate concession to a single entity, or ownership of the fixed infrastructure by the Government's existing track owner, the Australian Rail Track Corporation with open access by operating companies. Other options are possible. Given that the network will be built in stages, an 'open system' approach should be specified so that trains built by a variety of operators can run on it.

- In conducting the scoping study, the Government should invite submissions from interested parties as input to its analysis. The project should ultimately be market driven (rather than technology driven); there is no point in specifying a project for which a strong business case cannot be developed.

- While the issue of freight will primarily be a matter for the market, the study should consider to what extent high speed rail can contribute to the freight task, and can complement or contribute to the improvement of the existing interstate main line network.

Following the scoping study, the Government would be in a position to indicate a preferred first stage of the network and the key parameters for its financing; and to call for Expressions of Interest in its development. The Government may wish to specify an ownership structure, or it may wish to invite proposals from bidders; a key requirement, as indicated above, will be an 'open system' approach so that competition is maximized, both for operation of the first stage and for the development of further stages.

By following this course, Australia will join the many countries around the world which are gaining the transport, energy efficiency and environmental benefits of high speed rail.

The world speed record for rail: 575km/h, set in France in April 2007. Photo: *Jean-Marc Frybourg*

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Front cover picture: a 300km/h train for China, to run initially between Beijing and Tianjin. Photo: *Siemens*

New lines in operation at 250 km/h or more

Opened	Country	Route	Length km
1964	Japan	Tokaido Shinkansen	515
1972-75	Japan	Sanyo Shinkansen	553
1977-90	Italy	Roma – Firenze diretissima	246
1981-83	France	LGV Sud-Est	355
1982-91	Japan	Tohoku Shinkansen	535
1982	Japan	Joetsu Shinkansen	303
1987-91	Germany	Mannheim – Stuttgart	99
1989-90	France	LGV Atlantique	280
1991	Germany	Hannover – Würzburg	327
1992-94	France	LGV Rhône-Alpes	114
1992	Spain	Madrid – Sevilla	471
1993-96	France	LGV Nord	333
1994	France	LGV Interconnexion	102
1997	Japan	Nagano Shinkansen	117
1997	Belgium	LGV 1, Antoing – Halle	75
1998	Germany	Hannover – Berlin	264
2001	France	LGV Méditerranée	241
2002	Japan	Morioka – Hachinohe	97
2002	Germany	Köln – Frankfurt	177
2002	Belgium	LGV 2, Leuven – Ans	95
2003	China	Qinhuangdao – Shenyang	405
2003-07	UK	High Speed 1 (CTRL)	109
2003	Spain	Madrid – Lleida	481
2004	South Korea	Seoul – Daegu	224
2004	Japan	Kyushu Shinkansen	127
2005	Italy	Roma – Napoli	225
2005	Italy	Torino – Novara	85
2005	Spain	Madrid – Toledo	26
2006	Germany	Nürnberg – Ingolstadt	83
2006	Spain	Lleida – Tarragona	83
2006-07	Spain	Córdoba – Málaga	169
2007	Taiwan	Taipei – Kaohsiung	339
2007	France	LGV Est Phase 1	300
2007	Spain	Madrid – Valladolid	180
2008	Spain	Camp de Tarragona – Barcelona	108
New lines under construction			
2008	Belgium	LGV4, Antwerpen – Dutch border	40
2008	China	Beijing – Tianjin	115
2008	Italy	Milano – Bologna	182
2008	Netherlands	HSL-Zuid	85
2008	Turkey	Ankara – Istanbul Phase 1	251
2009	Belgium	LGV3, Liège – Aachen	42
2009	China	Wuhan – Guangzhou	968
2009	Italy	Novara – Milano	40
2009	Italy	Bologna – Firenze	79
2009	Spain	Madrid – Valencia – Alacant	914
2009	Spain	Barcelona – Figueras	132
2010	France	LGV Bretagne-Pays-de-la-Loire	182
2010	Italy	Firenze cross-city tunnel	7
2010	S Korea	Daegu – Busan	129
2011	France	LGV Rhin-Rhône	140
2012	Italy	Milano – Verona	137
2012	Italy	Verona – Padova	80
2013	China	Tianjin – Shanghai	1213
2013	Italy	Milano – Genova	114
2017	S Korea	Osong – Mokpo	230
2019	Germany	Stuttgart – Ulm	60
-	Germany	Nürnberg – Erfurt – Halle/ Leipzig	313
-	Japan	Hakata – Shin Yatsushiro	130
-	China	Hefei – Nanjing	166
-	Japan	Hachinohe – Shin Aomori	81
-	Japan	Hokuriku Shinkansen, Nagano – Toyama	162