

**THE SPEEDRAIL PROJECT FOR A HIGH-SPEED  
RAIL LINK BETWEEN SYDNEY AND CANBERRA**

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**ABSTRACT**

Speedrail is a proposal for a high-speed rail service linking Sydney with Canberra, driven by its strong potential for sharing an existing market of more than 6.8 million Sydney-Canberra trips and 3.5 million intermediate trips.

A 1995 feasibility study found that Speedrail's Sydney-Canberra link is commercially financible. The proposal is being assessed by the New South Wales, Commonwealth and Australian Capital Territory governments.

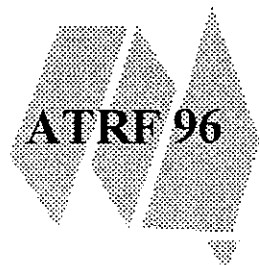
Capital costs will approach Aust\$2 billion. Initially, trains will run at 300km/h between the outskirts of Sydney and Canberra, using proven TGV technology. In Sydney's suburban area they will run at reduced speeds. Services will travel via the New Southern Railway, now under construction, and will be able to pick up passengers at Sydney airport.

The journey time from Sydney Central to Canberra for non-stop trains will be 1 hour 20 minutes - comparable with air when access/egress, check-in and waiting times are included

The paper outlines the proposal and mentions similarities with overseas developments; differences from other projects (constructing privately-owned infrastructure and operating a service over it is unusual in Australia); policy issues for government such as land acquisition and financial involvement; and inter-operability

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by

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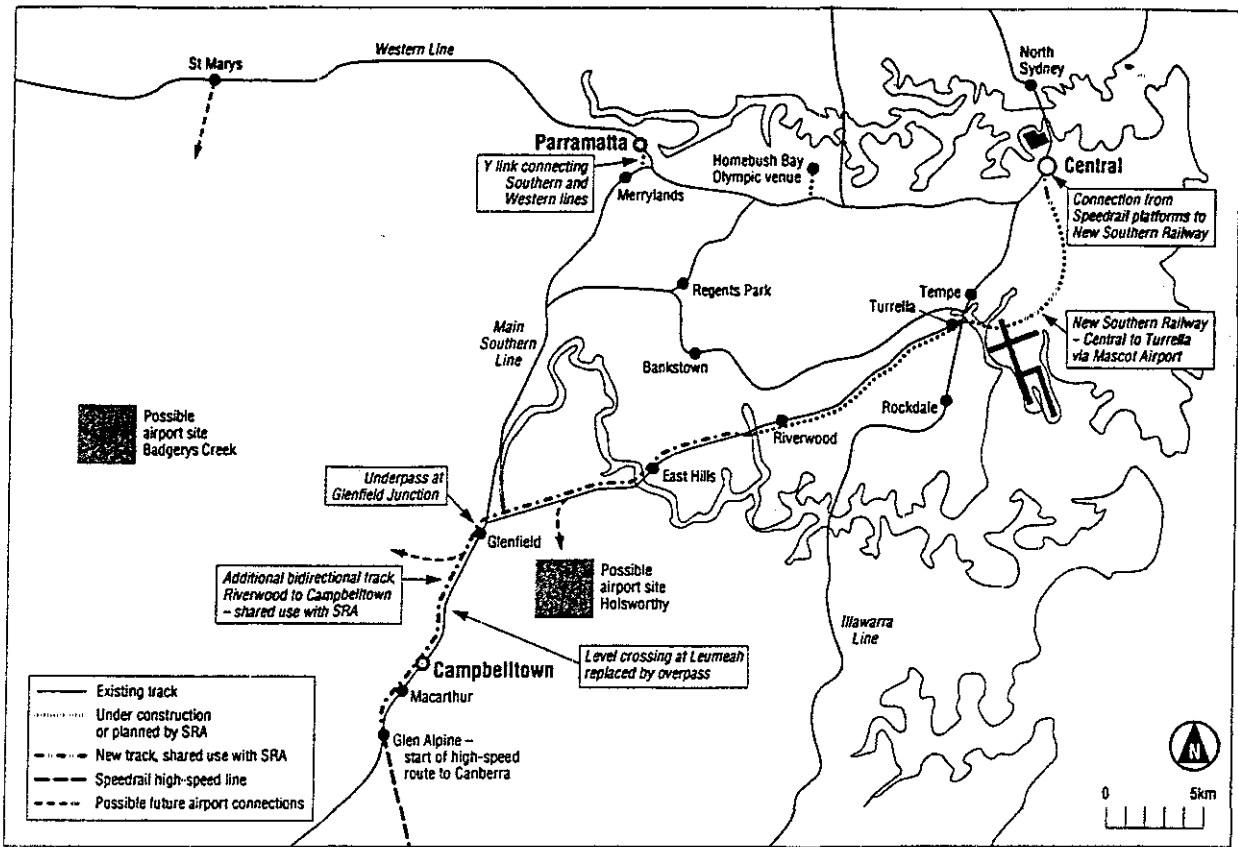
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## Introduction

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Speedrail is a proposal for a high-speed rail service linking Sydney with Canberra. The service will have the following features:

- The journey time from Sydney Central to Canberra for non-stop trains will be 1 hour 20 minutes. This journey time is comparable with air when access/egress, check-in and waiting times are taken into account.
- The service will be very frequent, with a trip every hour from early in the morning until late at night.
- The service will be highly reliable and punctual, and virtually free of delays caused by weather conditions.
- Speedrail's estimated full economy Sydney-Canberra fare is \$75 in 1996 dollars. This is about half the current airline full economy fare. Speedrail will offer a range of fares including discounts.
- Initially, trains will run at 300 km/h between the outskirts of Sydney and Canberra, using proven TGV technology. Speedrail's infrastructure and control systems will be able to accommodate 350 km/h trains when they become available. In the Sydney suburban area, Speedrail trains will run at reduced speeds, comparable with those of existing trains.
- Speedrail's Sydney terminal will be at Central station, either on the surface or underground depending on the optimum connection with the New Southern Railway. Services will travel via the New Southern Railway, now under construction, and will be able to pick up passengers at the domestic and international terminals at Sydney airport. Some Speedrail trains will make an additional stop at a station in the Glenfield/Campbelltown locality, improving access for travellers from nearby areas. Most trains will then run non-stop to Canberra.
- Intermediate stations will serve the Southern Highlands and Goulburn. These centres will be served by trains additional to the non-stop Sydney-Canberra services.
- Speedrail's Canberra terminal is planned to be located adjacent to Canberra airport.
- Speedrail's trains are fully compatible with the track, electrical supply and signalling systems of the Sydney suburban rail network. Accordingly, some Speedrail services are planned to originate from Parramatta, or a location nearby such as Clyde, rather than Central, to provide improved access for travellers from western Sydney.



Sydney entry and airport links

Mode	Sydney-Canberra trips	Trips within corridor	Total trips
Car	5,440,000	3,326,000	8,766,000
Air	688,000	-	688,000
Scheduled coach	344,000	40,000	384,000
Unscheduled coach	203,000	55,000	258,000
Train	109,000	57,000	165,000
<b>TOTAL</b>	<b>6,784,000</b>	<b>3,477,000</b>	<b>10,261,000</b>

Sydney-Canberra corridor travel in 1994

Speedrail is a private-sector joint venture between Speedrail Pty Ltd and GEC ALSTHOM Australia Limited. The Hindmarsh Group – an Australian based project management organisation with interests in property, construction and investment in Australia, South East Asia and the USA – is an equity participant in Speedrail Pty Ltd.

A feasibility study of the project was completed in the first half of 1995. The overall finding of the study was that Speedrail's Sydney-Canberra link is commercially financible.

With a capital cost approaching \$2 billion, Speedrail is among the very largest investment projects under consideration in

Australia today. It is certainly the largest infrastructure project, as indicated in listings published by the Development Allowance Authority.

The proposal is currently being assessed by a secretariat established by the New South Wales, Commonwealth and ACT governments. The Commonwealth Government has given Speedrail "major project facilitation" status. This is aimed at ensuring that necessary government approvals are coordinated and resolved within commercial time frames.

GEC ALSTHOM, the major partner in Speedrail, has signified its interest in taking a substantial long-term equity position in the project, to the extent of \$200 million or some 40% of the equity requirement. Speedrail's proponents are currently holding discussions with other potential investors.

## **High-speed rail in an international context**

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High-speed rail systems – defined as trains operating at speeds above 200 km/h on newly built alignments – are operating in six countries: Japan, France, Italy, Germany, Spain and Belgium. Extensions or new lines are being built in all of these six countries and in Korea; they are planned to start soon in Taiwan. High-speed railways are planned by at least a dozen more nations, encompassing almost every country in Europe, including eastern Europe, as well as Britain, the United States, Canada and of course Australia.

The following are some developments of particular relevance to high-speed rail in Australia.

- Belgium joined the high-speed rail club on 2 June 1996, when TGV services started running over the first section of the high-speed route from Lille to Brussels. At present only the first 14 kilometres of high-speed line in Belgium, from the French border near Lille to Antoing, has been commissioned. Until the remainder of the high-speed route to Brussels is completed in 1998, trains will complete their journey using existing tracks. When the

high-speed line is complete, the journey time from Paris to Brussels, previously 2 hours 15 minutes, will be cut to 1 hour 25 minutes.

The new line from Lille to Brussels is an important link in the European high-speed rail network. Eurostar trains operating from London to Brussels will use it, with an eventual journey time of only 2 hours 40 minutes. The line also forms part of the high-speed rail corridor linking Paris, Brussels, Cologne and Amsterdam.

- In Britain, a consortium entitled London and Continental Railways has been awarded a concession for construction and operation of a new high-speed connection from London to the Channel Tunnel. The new tracks will be shared, for much of their length, with commuter trains – as proposed by Speedrail for our tracks through the suburbs of Sydney. As a result, the British government will contribute very substantially to the cost of the project, and is handing over to the successful bidder the assets and business activities of the British component of European Passenger Services, the current high-speed Eurostar operation between London, Brussels and Paris. The project cost is about £3 billion, of which the government contribution will total about £1.4 billion, including the transfer of the Eurostar business.
- In Florida in the USA, a consortium including GEC ALSTHOM has been selected to finalise a proposal for the construction and operation of a high-speed network linking Miami with Orlando and Tampa, using TGV trains running at 320 km/h. The state government is committing US\$70 million per year for a period of 25 years to support the project. This follows a realisation that if car use were to continue unchecked, they would in the future need to build freeways 40 lanes wide. Such a prospect is unacceptable. Strong resistance also exists in Europe against the construction of further freeways.

The Florida project is also being assisted by the *High Speed Rail Development Act*, passed by the US Congress in 1994 and known as the *Swift Act*, after Al Swift who sponsored it. It provides federal assistance for planning, right-of-way acquisition and detailed design of high-speed railways.

On the other side of the USA, California's Intercity High Speed Rail Commission is investigating opportunities for high-speed rail in that state, particularly along the Los Angeles-San Francisco corridor.

- Spain is of interest because of all the countries currently operating high-speed rail, the size of the system most closely resembles that planned for Australia. High-speed rail has revolutionised travel between Madrid and Seville since its introduction in 1992.

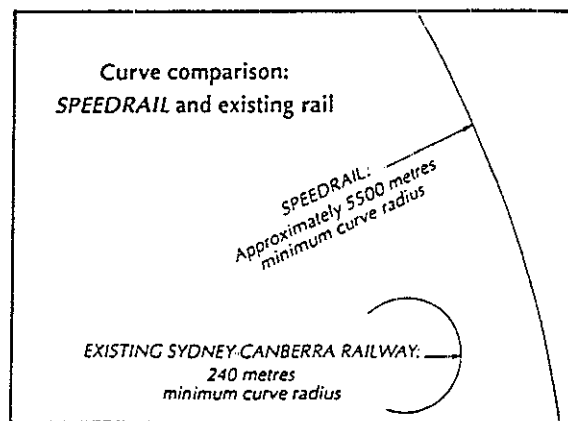
The Spanish railways have a policy that passengers receive a full refund of their fares whenever a high-speed train arrives more than five minutes late. When introduced, this led to an immediate increase in traffic and revenue of 11%. Since the scheme began, less than 0.2% of revenue has been returned as a result of the application of this policy. In 1995 the Spanish high-speed service operated 16,659 trips, of which only 10 failed to arrive within five minutes of schedule. The service recorded an increase in patronage of 8.5% over the previous year, while revenue grew by 13%.

As a result of efficient train maintenance, 100% of the train fleet is available at peak periods. Every unit is available for revenue-earning service.

Other high-speed rail systems also have high performance standards. For example in Japan, JR West, one of the operators of the Shinkansen or bullet train, has an average lateness of 24 seconds.

- In Canada, there have been a number of studies of proposals for high-speed rail between Quebec, Montreal, Ottawa, Toronto and Windsor. It is of interest that the

most recent report specifically compared a 300 km/h system – similar to Speedrail – with a lower speed, 200 km/h option. The study found that in both financial and benefit-cost terms, 300 km/h technology is superior to the 200 km/h option.



Curve comparison: Speedrail and existing rail

- There is a wide disparity between construction costs in countries building and planning high-speed rail systems. The differences are explained by terrain, by differing construction standards and by population density.

Terrain conditions, driving the need for tunnels and bridges, are the most important factor. Construction standards also have a substantial impact. A decision to share the use of high-speed tracks between passenger and freight trains, leading to the adoption of less steep gradients, pushes cost up. Perhaps as a result of this, and of the population density aspect, construction costs for high-speed rail lines in Germany are double those in France.

The high-speed line under construction in Belgium demonstrates clearly the impact of population density. When villages are only two or three kilometres apart, it is impossible for a new high-speed alignment to avoid them. There are at least two

locations where the line is being placed in a cut-and-cover tunnel, at great expense, to minimise the impact on towns and villages.

From these factors it can be appreciated why Speedrail is a relatively low-cost system. There is easy terrain between Sydney and Canberra, with no tunnels apart from the New Southern Railway between Central and Mascot airport. Speedrail will have only a small number of major bridges. It will have alignment standards tailored specifically for high-speed trains, reducing cut and fill and thus minimising construction costs.

Finally, low population density, while not helpful to revenue, means that Speedrail can readily avoid settled areas all the way from the edge of Sydney to Canberra.

- High-speed trains and services are becoming increasingly sophisticated. On-board facilities are superior to those in aircraft. They include not only entertainment such as personalised TV screens, but office facilities including phone and fax services. Mobile phones can be used. Data screens provide information on the train service, including time to the next station. The standard of on-board catering is high. A variety of seating arrangements is offered, giving first-class passengers, in particular, the advantages of choice. Ancillary services such as door-to-door baggage transfer have been introduced in Germany.

## The international scene: general issues and conclusions

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High-speed rail projects are proceeding in many countries. The benefits of high-speed rail are well recognised and documented. It competes strongly with air and road over distances in the approximate range of 250 km to 1,000 km.

High-speed rail has significant net environmental benefits. In particular, high-speed trains are more efficient users of energy than cars or aircraft. Noise is an issue

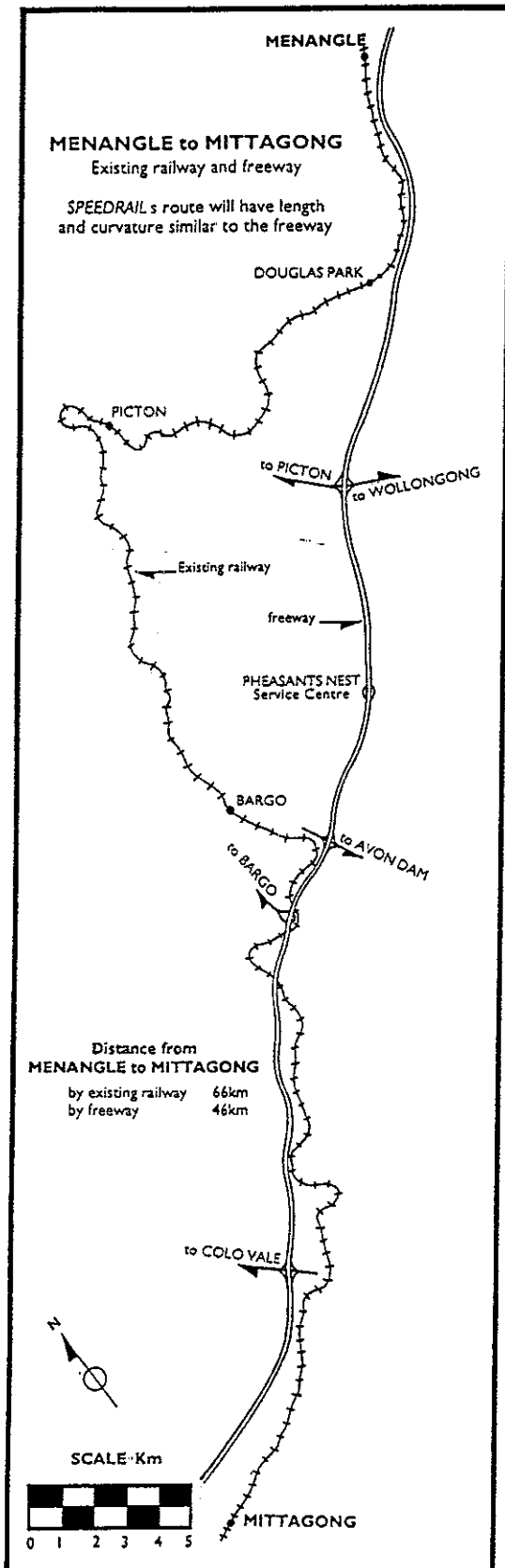
along the route, particularly in closely settled areas, but is addressed by providing barriers alongside the line where necessary, and trains are becoming quieter through improved design.

Regional development benefits are important. In France, towns campaign vigorously to have new high-speed rail routes pass nearby, so that they can gain the benefits of the system.

Funding of projects is a topic of widespread interest. Projects built to date have been government-financed, with some innovative packaging including local contributions in France. For the future there is no clear pattern, other than a move towards mixed government/private sector funding. Government contributions are seen as an essential component, even in strongly private-sector oriented countries such as the United States. This is perhaps a recognition of the situation applying to competitive modes, wherein airports and roads are typically provided by government, with users paying on an "as used" basis: new airlines do not have to pay up front for new airports.

300 km/h is being regarded as a benchmark operating speed. There appear to be no proposals for newly built lines to operate at speeds below 300 km/h. Many proposals are adopting the same approach as Speedrail, of designing the alignment for 350 km/h operation, with initial services at 300 km/h. And there is no doubt that speeds will increase above 300 km/h, to 350 km/h or even higher. Trains with operating speeds in the region of 350 km/h already exist in prototype form, or are being planned, in Germany, Japan and France. The next new TGV route in France, the TGV Est from Paris to Strasbourg, is expected to be the first railway in the world to have a normal operating speed of 350 km/h.

Inter-operability is an issue in Europe. Although European countries have a common railway gauge, electrification and signalling systems vary greatly. It is thus difficult for high-speed trains, and their drivers, to operate internationally. The significance of this for Australia is that extensions of Speedrail, for example to Melbourne or Brisbane, must adopt the same engineering standards as the Sydney-Canberra link.



Menangle to Mittagong - existing railway and freeway

## Speedrail: differences from other projects

Speedrail is unusual, in that it is a proposal for the construction of privately owned infrastructure, and the operation of a service over it. Indeed the Speedrail proposal is market or service-driven. The construction of Speedrail's infrastructure - a new railway extending over a distance of more than 200 km - tends to dominate consideration of the project, because of its cost and the issues associated with its construction. However, it is important to understand that the construction of the infrastructure follows the requirements of the service, and not the reverse.

Speedrail is different from most of the other current or recent projects or proposals for private sector involvement in areas of transport hitherto regarded as the preserve of governments. It is unlike the provision of motorways such as the M2, M4 and M5 in Sydney, where the private sector has built or is building roads which had been planned by the government, but which had not been built because of lack of finance. Once built, the role of the private sector as operator is minimal. Those projects provide a facility for the movement of road vehicles - cars and trucks. The private sector does not provide a service

along the infrastructure, in the same way as we understand the operation of a rail or bus or air service.

Conversely, Speedrail is also different from proposals to open up the government-owned rail systems in Australia to private operators. In this context the role of the private sector is limited to operation, and excludes provision of, or improvement to, the infrastructure. Progress is being made towards the establishment of open access regimes, whereby new operators will be able to run trains along existing railway tracks: such a regime came into effect in New South Wales on 1 July 1996.

Speedrail is different from both of these examples because, as already indicated, the project involves both the provision of infrastructure necessary to provide a service, and the operation of that service. The nearest comparable example, which is

about one-twentieth of the size of Speedrail, is the Pyrmont-Ultimo light rail project in Sydney, which also involves provision of infrastructure and operation of a service. Other examples with a degree of relevance are the privately-owned iron ore railways in the north-west of Western Australia. But these purpose-built freight railways bear little resemblance to a project such as Speedrail, which aims to carry passengers in a relatively densely populated area of Australia. Also unlike the iron ore railways, operating in areas remote from population, Speedrail will use existing SRA tracks or alignments to reach the centre of Sydney and to run through the suburbs. It is not an independent, stand-alone project in an operational sense.

Another relevant example is the Skitube railway in the New South Wales snow-fields, which provides a link, mostly underground, from Bullocks Flat terminal to Blue Cow, via Perisher Valley. This too is similar to Speedrail, in that the proponents built the infrastructure, and operate a service over it. Incidentally the approval procedures for this railway were unusual. Because it is almost completely located within – or beneath – the Kosciusko National Park, the approval conditions related solely to those applying to national parks. No legislation was passed to provide for its construction. The proposal only had to meet requirements – and they were arduous – for activities within a national park. Like other railways, Skitube is of course subject to the provisions of the NSW *Rail Safety Act*. Skitube is different from the Pyrmont-Ultimo light rail project, where legislation is being introduced to establish the powers of the consortium to lay track and operate rail vehicles in city streets.

## Issues for government

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Many issues relating to Speedrail are readily addressed within existing policies. Access to track in the Sydney suburban area is facilitated by recently-developed policies on open access, referred to earlier. Safety issues will be resolved by compliance with the *Rail Safety Act*. Business issues will be addressed by compliance with the *Trade Practices Act*, and in many other areas Speedrail will be subject to the

laws and regulations applying to any commercial undertaking.

However, the project does present a number of issues which do not fit any of the policy frameworks that already exist. As has been mentioned, it is not an example of the private provision of public infrastructure like a road; and it is much more than a private sector operator running trains on the existing network. Government has to construct a new framework for Speedrail, and that is in a sense the reason for establishment of the three-government secretariat referred to earlier.

### Land acquisition

Of the government issues specific to Speedrail, the most important is the acquisition of land for the route. Like any railway or road, land must be acquired from land holders along the route. Most can be acquired through negotiation, but there will inevitably be a need for compulsory acquisition, with appropriate compensation. Is it appropriate for government to bestow on a private sector entity such powers of compulsory acquisition? Similar issues arise for the Eastern Gas Pipeline, currently planned by a consortium of BHP and West Coast Energy – although in that case all that is required is the acquisition of an easement, below which the pipeline is buried. If the privatisation of airports is taken to its ultimate conclusion, whereby not only are existing airports sold but government withdraws from any plans to build airports in the future, a private sector entity planning a new capital city airport will face the same issues in relation to the acquisition of land for the airport.

Rather than leave this important question unanswered, it should be stated that Speedrail proposes that its right-of-way be acquired and owned by government, with Speedrail paying a lease fee. Such an approach is in fact consistent with plans for the so-called sale of Australia's major airports: they will not in fact be sold outright but will be leased.

### Government financial involvement

A key issue is that of government financial involvement with the project. Around the world, high-speed railways are either built



and operated by governments, or provided within a framework that provides direct government financial support – as is the case with the current project in Florida. This reflects the fact that these projects, including Speedrail, bring very substantial economic and community benefits. Speedrail will create many jobs – 13,500 for the three years of its construction. Speedrail will have social benefits, easing growth pressures on Sydney. It will promote regional development along the Sydney–Canberra corridor. High-speed rail systems are extremely safe, with not a single fatality recorded since the new era of high-speed rail began in Japan in 1964.

Given that many of these benefits are external, and cannot be captured by the sponsors of the project, the issue arises as to the justifiable level of government support to enable the community to realise those benefits.

Speedrail's proposals for government financial involvement are extremely modest by world standards. Speedrail will build new track and associated facilities in the Sydney suburban area, available for shared use by SRA trains. Payment for these facilities would be made by government via a take-or-pay throughput agreement over 25 years. Speedrail will pay running rights for those sections of SRA track that it uses, for example the New Southern Railway, and it will pay a lease fee for the strip of land acquired for the high-speed route from Campbelltown to the NSW/ACT border. The advent of Speedrail will enable the cessation of the existing loss-making passenger train service to Canberra. The result of the various payments in both directions is a small net payment to Speedrail, for which the state and the nation gain the benefits of a \$2 billion project.

### Risks

An issue for government, as it is for Speedrail's proponents, is that of the risks associated with the project. The proponents will carry the major risks of a construction cost over-run or of a shortfall in revenue below predicted levels. The project will be subject to an intense level of scrutiny by both equity partners and lenders, who will consider these issues before commitment to a financial close.

Two aspects of risk to government associated with the project have been raised. First is the risk that the project will fail before construction is completed, and that an obligation would fall on government to finish it. Second is the risk that it will fail during the operational phase, and that an obligation would fall on government to step in and continue to operate it.

If completion guarantees prove to be insufficient to ensure that the project is completed - highly unlikely given the construction guarantees and the level of companies involved - it should not be expected that financiers would look to government to finish the uncompleted project. They are more likely to seek an arrangement with alternative private-sector interests. Indeed not only will government have no obligation to finish the project, it will have no right to do so. The right to take over the uncompleted project will lie with the financial institutions which are lenders to the venture.

Once the project is completed and commissioned, it is highly unlikely that operations would cease. Consistent with other high-speed rail projects, Speedrail's operating costs are estimated to be about one-third of gross revenues. The major outlays in the early operational years are debt repayments, not operating costs. Even if revenues were only 50% of those forecast, and if no operating cost savings were introduced, revenues would still easily exceed operating costs. If the operating company defaults on loan repayments, the lenders may take control of the project – but it would be in their interests to keep it operating. Again, the right to take action would lie with the banks or other financial institutions which are lenders, not with government.

### Impact on Sydney Airport

Finally, an important issue associated with Speedrail arises not from the fact of it being a private sector proposal, but directly from the nature of the service planned. Speedrail is expected to replace the air service between Sydney and Canberra. In so doing it will relieve Sydney airport of some 60 movements per day. It is not often recognised that Sydney–Canberra is the third-busiest air route in Australia, in terms of the number of

aircraft movements. (The four busiest routes in order are Sydney-Melbourne, Sydney-Brisbane, Sydney-Canberra and Sydney-Gold Coast.) Thus Speedrail has implications which directly affect another transport mode, and affect it in a very contentious area, that of airport capacity in Sydney. The policy of the incoming Federal Government – that movements at Mascot will be capped at 80 per hour – will provide a strong incentive for airlines to maximise the return they receive from each aircraft movement. Routes which are less profitable and which use small aircraft will be looked at critically by airlines, and the service to Canberra will be an early candidate for attention.

In general in Australia, there is a tendency to examine transport modes in isolation from one another. The needs of road, air, rail and shipping are too frequently considered on a piece-meal basis. Speedrail's Sydney-Canberra link will have a significant and beneficial impact on congestion at Sydney airport – and if the high-speed rail service is ultimately extended to Melbourne, or via the Gold Coast to Brisbane, the effects will be very much greater. It will be a challenge for our policy-makers to recognise and address the inter-modal impacts of a high-speed rail service such as Speedrail.

## Conclusion

Speedrail presents a number of policy issues for governments. This discussion should not be construed as implying that Speedrail represents, in toto, a problem for governments. Rather it presents a very significant opportunity, or range of opportunities.

Speedrail will introduce world-best practice in rail passenger transport to Australia. Through its efficiency as a transport system it will contribute to micro-economic reform. It will bring a range of benefits, as discussed earlier: lower travel costs, reduced energy consumption, employment generation, regional development and others.

The next stage in the project, following the current evaluation by the three governments, will be a development phase in which other investors will join the joint venture, and work will be done to refine the detail of the project, including route definition and environmental studies leading to the Environmental Impact Statement. If the project moves promptly into this phase, construction could begin in 1998 and the Sydney Canberra service could begin in 2001, the year of the centenary of Australia's federation.

