

22<sup>nd</sup> May 2013

Director, High Speed Rail Study  
Department of Infrastructure and Transport  
GPO Box 594  
Canberra ACT 2601

Dear Director,

In response to the invitation to provide comment to the High Speed Rail Phase-2 Report 10,000 Friends of Greater Sydney (FROGS) makes this submission.

### ***Credentials for making Submission***

FROGS was established specifically to pursue implementation of the *Sustainable Transport in Sustainable Cities* (STinSC) project completed by the Warren Centre at Sydney University, 2000-2003 which gave Sydney the concept of *A City of Cities* as the basis for developing Sydney.

FROGS is currently expanding the STSC study to 2051.

### ***Comments on the High Speed Rail Phase-2 Report***

#### **A Viable Way Forward?**

The Phase-2 report makes a useful contribution to identifying some major potential benefits of a future High Speed Rail (HSR) network, especially the high economic value of business trips between State capitals.

However, as currently specified, the project lacks an economically viable way forward, because:

- the majority of perceived benefits are dependent on completing the full network (or at least Sydney to Melbourne) and are subject to much risk, not least as they depend on very long term population forecasts and technological uncertainties (i.e. whether the currently specified technology will be the best available in the future),
- the full network is unaffordable in the near term and earlier investment cannot be justified anyway as the Benefit / Cost ratio is a marginal 1.1 at the standard discount rate of 7% accepted by Australian Treasuries (a lower rate will be considered inappropriate without explicit adjustment of benefits for systemic risks), and,
- any first stage to the project will be especially uneconomic, as it will incur the high costs of excessive tunnelling required in the capital cities (especially Sydney), but deliver relatively smaller benefits.

If Australia is to develop a HSR network, it needs a realistic implementation strategy where each stage is economically viable in its own right, and future stages can be varied in design or timing (or even cancelled) depending on the unfolding economic, demographic and technological future.

Even though it is not possible at this stage to commit to a full HSR network, reserving potential corridors in the near future can support a



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Greater Sydney<sup>R</sup>**  
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***Working Towards a  
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flexible, staged and economically viable strategy that could ultimately deliver HSR. This may involve preservation of multiple corridors, to keep options open for the alternative technologies and routes (such as those discussed below) that may be revealed as optimal in future.

Preserving corridors can substantially reduce the future cost of future infrastructure provision, yet may have little cost either in direct financial terms (if implemented through planning controls rather than property acquisition) or even economic terms – since corridor preservation can direct future property development around and along the corridor, rather than preventing development levels overall (thus creating little opportunity cost).

### **Objectives of a High Speed Rail (HSR) Network**

While economic analysis of a defined project should demonstrate confidence that the benefits to society will exceed the project's costs, project development activities could be guided by a clearer articulation of objectives. A number of potential objectives (and prospective project benefits) are not currently captured in the Phase-2 report or its economic analysis, but could be important justification for viable first stage and/or subsequent stage investments.

For example, it seems a key objective should be to promote development of regional cities rather than the over-concentration of population in a limited number of huge cities. Better connection of regional cities to Sydney could support continued population and business growth linked to Sydney's high-productivity economy, but with less housing and transport congestion than would otherwise result (and which seems to be already slowing Sydney's growth). Stage-1 investments that brought the Central Coast, Wollongong and other relatively near regional centres to within closer commuting distance of Sydney could deliver such benefits, without necessarily requiring the ultimate HSR technology (e.g. tilt trains with some straightening of existing track).

Travel times will be minimised and regional city growth maximised if the number of regional stops are kept to a minimum, and smaller regional centres are connected to the HSR / mainline by rapid bus links. Over time, the growth of the selected regional cities would build up higher levels of travel demand, which could then provide stronger justification for subsequent larger investments. The benchmark for Sydney in this respect is South East England, where 900,000 people commute to Greater London each day to work by fast rail and 300,000 workers commute from Greater London to Regional Cities within a 150 km radius.

The objective of supporting Sydney-based economic development also requires consideration of synergistic options to enhance Sydney's internal rail network and promote business development in its population centre at Parramatta – particularly by better connecting it to Sydney CBD through a new “Western Express” line (see below).

Another objective could be the growth of efficient and environmentally less damaging rail freight (avoiding the costs of truck growth), which HSR could support by relieving current rail lines of passenger demand (especially between Sydney and Newcastle). Alternatively, “stage-1” rail investments could be transferred to freight use when future new technologies such as Maglev can offer a better full inter-city HSR passenger service.

HSR could also avoid the cost of expanding other transport modes (particularly roads and aviation) that would otherwise be required to support passenger growth along the east coast over the next 40-50 years. Importantly, the higher quality journey that it would provide creates the opportunity of extracting greater revenues from users (and reducing the cost to Government) – especially for business customers, who will have greater opportunity for working on the train than when travelling by plane, car or taxi. This would involve standard yield management pricing techniques, as applied by all airlines and European train businesses (rather than the flat fares assumed in the Phase-2 modelling).

### **Supporting Sydney's Development – the “Western Express”**

One of the options short-listed in the Phase-1 HSR report for further detailed analysis was for a HSR link into Sydney's centroid and population centre at Parramatta, rather than Sydney CBD. This would be supported by interchange to/from a separate new fast metro "Western Express" line, which would connect Sydney's CBD to Parramatta with a travel time of only about 10 minutes, before continuing on to Penrith on existing tracks.<sup>1</sup> The combination of this line and Sydney's broader transport network would ensure all areas of Sydney were closely connected to the HSR station at Parramatta.

Parramatta is an appropriate location for a future HSR terminus, given that by mid century it is expected to have a workforce of 100,000, with 4 million people living to its west (vs 2 ½ million to the east) and a strong flow of high-level professionals from Sydney's high-growth residential North West, as well as from the Golden Arc of major business activity to the North and North-East (including a workforce of 100,000 at Macquarie Park). Strong growth in Western Sydney's population and economy is quite likely to be also supported by an airport at Badgerys Creek.

The Western Express metro may be economically viable in its own right in the relatively near future, and has been previously proposed as a self-funded, premium-priced privately financed project. With frequent, all-day, "turn up and go" services, the project would deliver dramatic time savings (compared to current total travel times of over an hour) and increased capacity for existing customers on Sydney's busiest rail corridor, and the improved connectivity to Sydney CBD could also support increased business location in Parramatta, whilst maintaining strong agglomeration economic benefits through the tight link to Sydney CBD.

Taking advantage of the Western Express, a HSR link terminating in Parramatta would avoid about three quarters of the 67 kms tunnelling currently specified, thus reducing the cost by billions of dollars and making stage-1 projects to Newcastle or Canberra more affordable and economically viable in the nearer term.

However, despite the Phase-1 study recommendations, it seems the Phase-2 Study has inappropriately specified the option of terminating HSR at Parramatta, by excluding the Western Express. The Phase-2 report makes no reference to the Western Express and indicates that the option evaluated has \$45 billion lower user benefits (vs HSR going to Sydney CBD), which are attributed to "the need to transfer modes and travel a further 20 kilometres, as well as the lack of potential parking to cater for demand by car". This magnitude of benefit loss implies an average time loss in the order of an hour per business customer, which could be consistent with assuming travel from Sydney CBD on existing CityRail services. It also implies that the overwhelming majority of HSR business travellers are travelling from Sydney's CBD or eastern suburbs, which raises questions as to the validity of the assumed pattern of trip origins and destinations in 40-50 years. There is no transparency on these assumptions in the Phase-2 report, even though they have a major impact on the claimed economic benefits (since access to/from HSR stations vs the airport represents a significant portion of total benefits and the value of business travel time swamps that of leisure trips). New business market surveys may be needed to ensure a robust understanding of these critical parameters.

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<sup>1</sup> Sydney Rail Plan Stage 1. A Strategy to take advantage of the Existing Rail Infrastructure and provide more trains, more seats, less wait, faster trips, 10,000 Friends of Greater Sydney Dec 2009. & Why does Sydney need a new fast Metro to the West ? 10,000 Friends of Greater Sydney Dec 2010

## **Future Technology**

As discussed above, a staged implementation strategy could potentially adopt different technologies for different stages. If final stage investments may not be made for 20 years or more, then a stage-1 investment would need to deliver most of its economic returns prior to this, and could extract residual value by, for example, subsequently being used for freight.

This means that the ultimate technology used to connect Australia's major cities need not rely on those technologies available today – as the Phase-2 report assumes. On the contrary, today's technologies are highly unlikely to be the best option available in twenty years.

Current developments in train technology development provide guidance on the sort of technologies that could be adopted.

One clear trend is the development of advanced train control systems, which permit safe operation of closely-spaced driverless trains at speed. Driverless operation, adopted in many metro systems around the world, fundamentally changes system optimisation, as it allows for smaller vehicles without increased operating costs. As control systems continue to develop, this will favour smaller, more frequent vehicles, especially on lower demand corridors. That in turn may permit more light-weight and lower cost infrastructure systems.

For very high demand corridors, China and Japan are looking at alternatives for future high speed rail. China has indicated favorable infrastructure costs for magnetic levitation technology, but still has issues with the train technology. In contrast it seems Japan believes magnetic levitation is the future technology for high speed trains and its next planned route, for Tokyo to Osaka, is being developed as magnetic levitation.

Maglev offers higher speeds, which is of particular importance in the context of the relatively long distance between Australia's capital cities. Even a relatively small speed increase would have material impact on the time savings relative to flying, which could significantly increase patronage attractiveness (and the economic benefits and revenue potential per passenger).

Maglev technology could also substantially reduce costs through difficult terrain as it can operate at much steeper grades, up to 5%. This could be significant on the Sydney-Newcastle leg, which has the highest cost per km. It could also impact on the Sydney-Canberra leg, permitting its route to run via Wollongong attracting greater patronage to this route and increasing its viability.

Maglev technology could also ease the need and significantly greater cost for tunneling particularly close to urban areas as it is primarily built above ground and can be accommodated within existing transport corridors e.g. the M7 Motorway corridor.

## **Recommendations**

To progress HSR further requires a realistic and economically-viable staged investment strategy, based on the following elements:

1. Immediate update of HSR business case to:
  - a. correctly assess the economic benefits of the Parramatta-Western Express option – drawing primarily from prior studies,
  - b. include more ambitious targets for business revenue (based on supportable assumptions for the Sydney business market, with transparency of origins and destinations within Sydney and the key trip attributes of value),
  - c. provide benefits to freight (e.g. through relief of existing track), and
  - d. determine potential alignment changes that may result from use of alternative future technologies, such as Maglev.

2. Reserve the corridors (and station locations and connections) identified by the updated HSR business case.
3. Identify and deliver short-term improvements to Sydney commuter links to Gosford-Newcastle and Wollongong (considering tilt trains and straightening existing track, and other transport modes) – to deliver immediate economic development benefits whilst building up regional demand to justify larger future investments.
4. “Western Express” fast metro Sydney CBD to Parramatta and Penrith – to support existing travel patterns and the future development of Parramatta.
5. HSR stage 1 from Parramatta to Wollongong-Canberra and Gosford-Newcastle (and no other stops) – possible Maglev.
6. Potential HSR second stages to Melbourne and Brisbane – possible Maglev.

Yours faithfully

## **Desmond Dent CEO**

*Desmond Dent  
Secretary and CEO  
10000 Friends of Greater Sydney*

*Signed on behalf of the following Directors*

John McInerney  
Ken Dobinson            Dobinson and Associates  
Bob Meyer                Cox Richardson  
Wayne Costin            Costin Roe  
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