

# ***VFT***

## ***Concept Report***



This report has been prepared as part of the feasibility study of the VFT, a proposal for a new high speed passenger transport system between Sydney, Canberra and Melbourne.

The purpose of the report is to address issues concerning the project which are of interest to governments. It has been prepared by the VFT Joint Venture, with discussion and comment at successive stages being provided by the New South Wales, Victorian and Commonwealth Governments and the ACT Administration.

The report has been submitted to Ministers in the respective governments, and is being published for the information of organisations and individuals with an interest in the project.

Published by VFT, a joint venture of The Broken Hill Proprietary Co. Ltd, Elders IXL Limited, Kumagai Gumi Co. Ltd and TNT Australia Pty Limited.

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Printed by Pirie Printers Sales Pty Ltd, Canberra, ACT

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Report***

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## PREFACE

This report is based on work undertaken on the VFT project up to and including the pre-feasibility report completed in June 1987, and the passenger market study completed in August 1988. All aspects of the project will be intensely reviewed during the feasibility study, scheduled for completion in 1990. Accordingly, statements and predictions made in this report are subject to revision in the light of work undertaken during that study.

# EXECUTIVE SUMMARY

## INTRODUCTION

The VFT is a proposal for a new high speed rail system between Sydney, Canberra and Melbourne. Speeds of up to 350 km/h will allow non stop travel times of one hour between Sydney and Canberra and two hours between Canberra and Melbourne, giving an overall time of three hours between the two State capitals.

The system will be electrically powered and will use steel wheels on steel rails, similar to the technology employed on the successful and profitable high speed railways in Japan and France, but utilising higher speeds. The operating speed of 350 km/h planned for the VFT will make it faster than any other train currently operating in the world.

The VFT project is planned to be built and operated by private enterprise. The current two year feasibility study of the project is being funded by a Joint Venture of BHP, Elders IXL, Kumagai and TNT to a budget of \$18.9 million.

Preparation of the Concept Report is an early activity in the feasibility study of the project. Its purpose is to address issues concerning the project which are of interest to governments. It has been prepared by the VFT Joint Venture, with discussion and comment at successive stages being provided by the New South Wales, Victorian and Commonwealth Governments and the ACT Administration.

The Concept Report does not attempt to resolve every VFT issue relevant to government. Rather, it is intended to identify and expose those issues, and to specify how they will be addressed during the remainder of the project. The Concept Report has been identified as the basis on which governments will make decisions to facilitate further activities involved in the feasibility study.

Receipt of positive government responses to the Concept Report is the first milestone in the feasibility study program. The VFT Joint Venture expects that governments will indicate their support for the feasibility study process in the following ways:

- take action promptly to facilitate access to land for survey and testing for route investigation purposes
- facilitate the feasibility study through the co-operation of all relevant departments and instrumentalities
- indicate that provided due processes including environmental studies are satisfactorily completed, governments will at that time support the project and will legislate to support the process of land acquisition for the route.

## STATUS OF THE PROPOSAL

The feasibility study is scheduled to be completed late in 1990. The design and construction period for the system is estimated at five years. If a decision to proceed is taken late in 1990, test operations on an initial section of track, possibly between Goulburn and Canberra, could begin in 1992 or 1993 and commercial operation between Sydney and Canberra could start by about the beginning of 1995. Full operation between Sydney and Melbourne could start by about the end of 1995.

## SERVICES

To meet the anticipated demand, on a typical weekday there will be more than 35 fast trains each way between Sydney and Melbourne. The fastest trains will take three hours from end to end, but other trains will take longer than this, depending on the number of intermediate stops. For much of the day fast services will be provided at hourly intervals, with additional services at peak periods, while most intermediate stations will be served by several trains per day. Fares will be structured to be competitive with alternative modes.

As well as carrying passengers, the VFT will also carry express freight, with the same transit times as for passengers. Additional revenue may also be available from use of the right-of-way for facilities such as pipelines or communication cables.

## ROUTE OF THE VFT

Work undertaken up to date by CSIRO and by consultants in the pre-feasibility study resulted in definition of the currently planned route of the VFT via Gippsland, and indicated that it is practical from an engineering viewpoint and is commercially viable.

Obviously there are other possible routes for the VFT. An essential requirement is that a service must be provided to Canberra. One of the aims of the feasibility study is to determine the best route for the VFT and the alternative options via Albury are currently being studied. Initially, this examination will be at a level of detail similar to that applied to the Gippsland route in the pre-feasibility stage. It is not possible to indicate how quickly a decision between the basic alternative routes, via Gippsland and via Albury, can be made. It is possible that, on the basis of the initial study at the "pre-feasibility" level, one route will have such a clear advantage that the other can be discarded. If there is a balance between the alternatives, further work at a more detailed level will be necessary before the decision is made.

The greater part of the content of the Concept Report is not specific to any route; however, unless otherwise indicated, those sections which are route-specific refer to the Gippsland route.

## TECHNOLOGY

The VFT will be a wheel-on-rail system, electrically powered from overhead wiring. It is similar in concept to the successful high speed railways already operating in Japan and France and under construction in Germany.

The current rail world speed record is 406 km/h, set by the German Federal Railways in May 1988. The highest commercial speed currently employed by a railway is 270 km/h on the French TGV line between Paris and Lyon. On the TGV Atlantique, which will link Paris with Le Mans and Tours, a speed of 300 km/h will be adopted from the start of operations in 1989.

The speeds currently achieved and planned by overseas railways provide confidence that the speed of 350 km/h planned for the VFT is technically feasible as well as commercially attractive. The feasibility study will determine and undertake any further work necessary to provide assurance of the technical feasibility, safety and reliability of such operations.

Consideration has been given to the adoption of magnetic levitation (Maglev) for the VFT, rather than a wheel-on-rail system. There are two reasons for the selection of wheel-on-rail technology for the VFT in preference to Maglev. First, none of the three competing systems (two in Japan and one in West Germany) have been sufficiently developed to be available in the timescale desired for the VFT. Second, the track cost for Maglev systems is currently about two and a half times that of a wheel-on-rail system.

The VFT trains will have a life of around 30 years, after which they will require replacement. At that time, or earlier if feasible and economically desirable, further consideration may be given as to whether those replacements should be wheel-on-rail trains, or whether the right-of-way should be converted for Maglev operation.

## FINANCES AND OWNERSHIP

Successive market studies have provided a high level of confidence in the predicted level of demand for the VFT service. A major passenger market study completed in August 1988 indicated a demand in 1995 of 6.6 million equivalent Sydney-Melbourne one way trips by VFT. A sensitivity analysis showed that demand for the VFT and its potential revenue would be very robust. The projected demand for the VFT is consistent with the current usage of high speed rail services in France and Japan, on a comparative population basis.

Capital and operating costs for the VFT were estimated in the pre-feasibility study. Financial analysis of the project has indicated rates of return which are sufficient to encourage further studies. However it is expected that financial structuring will be needed in order to make the project bankable. The financial structure of the VFT during the construction and operating phases will be considered in detail during the feasibility study.

## ALTERNATIVES TO THE CURRENT PROPOSAL

As already indicated, a study is being made of route options via Albury. Other alternatives to the current proposal include doing nothing to improve the existing railway alignment between Sydney and Melbourne, but relying increasingly on road and air services for passenger travel in the corridor; and upgrading the existing railway between Sydney and Melbourne, to provide a reduction in the travel time for passengers to around eight hours. These alternatives would not provide travellers and the Australian community with the benefits which will result from construction and operation of the VFT. A journey time of eight hours would attract a very small share of the market. Further, upgrading the existing line would not provide a service to Canberra.

## ECONOMIC IMPACTS

The VFT will have a number of economic impacts:

- It will play a major role in ensuring the realisation of the potential benefits to consumers of airline services from the increased scope for competition among domestic airlines on termination of the two airline agreement in 1990.
- It will facilitate a more balanced distribution of population in New South Wales and Victoria, and alleviate congestion in Sydney and Melbourne.
- It will provide higher levels of transportation output, generating substantial benefits from travel time savings.
- It will provide lower levels of inputs; it has lower operating costs than other modes, derived in large measure from its efficient use of energy. The VFT will use only one-fifth to one-seventh the energy per passenger used by jet aircraft or private cars.
- It will bring Australia to the forefront of rail transport technology, providing both local and export opportunities.
- The VFT corridor could serve wider uses, through construction of oil or gas pipelines, electricity transmission lines and communication services.
- It will have major beneficial impacts for tourism, helping to take the pressure off Sydney and Melbourne and spreading tourism demand more evenly along the corridor between those cities.
- It will alleviate Australia's balance of payments problems, by reducing the demand for imported vehicles, by allowing savings in fuel imports, by increasing invisible exports through the stimulation of tourism and by increasing Australia's technological and export capabilities.

- It will have significant employment effects, including the creation of some 25,000 jobs during the construction phase.
- During the project's construction, overheating of the market as a result of regional demand for skilled labour and the possible diversion of resources from other areas could create problems. At a macro level the effect of the VFT on the construction industry is not expected to impose significant strain on resources, although this issue will be reviewed during the feasibility study.
- On the basis of analysis undertaken in the pre-feasibility study, the project will provide a social return to the Australian community additional to the financial rate of return to the investors in the project.

## IMPACT ON OTHER TRANSPORT MODES

A major part of the passenger patronage of the VFT will be diverted from existing transport modes - air, coach, rail and car. Freight will be diverted from air and road.

The impact of the VFT will be greatest on air transport. It will delay the need for a second Sydney airport, and it opens up new options for that airport.

It will enable the cessation of existing unprofitable rail passenger services between Sydney and Canberra; Sydney and Melbourne; and Melbourne and Bairnsdale. The VFT will not affect existing rail freight operations, although it could provide revenue for them during the construction phase: there is also potential for synergy between the VFT and the FFT<sup>1</sup> proposal for a fast freight train service between Sydney and Melbourne.

Given that a significant proportion of existing rail travellers are pensioners and others travelling at concession rates, governments will wish to consider how such travellers can be provided for when the conventional rail services cease. It will be open for governments and the VFT to negotiate for the carriage of these travellers on the VFT, with governments paying for the VFT to carry them rather than supporting them through the existing rail systems.

The impact on the road-based modes will be less significant. To the extent that car travellers and freight are diverted from the Hume Highway, there is a substantial community benefit from lower exposure to road accidents.

Because of these impacts on other modes, a decision to build the VFT will affect a number of government decisions.

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<sup>1</sup> The FFT is a proposal for significant upgrading of the existing Sydney/Melbourne railway to improve its performance in hauling freight. Consultants have recently been engaged to undertake a pre-feasibility study of the FFT.

## CONSEQUENCES OF FAILURE

An issue of concern to governments is the potential liabilities with which they would be faced, should the VFT project not be completed, or if it should fail after completion.

Finance for the project will be provided largely by international banks which will require, as a condition of lending, commitments by the partners to complete construction of the project once started. Once completed, the project has a low operating cost relevant to total cost. The marginal cost of operation, i.e. labour, power and maintenance, is small in comparison with the level of annual interest and depreciation charges. Even if the market collapsed to a fraction of that assumed, the partners and the financiers would continue to operate the system in order to provide whatever contribution was possible towards debt repayment.

## ROUTE ACQUISITION

In urban areas it is planned the VFT will use government owned land, either within existing railway boundaries or in freeway median strips. Outside the urban areas, the VFT requires a new route and will buy the necessary strip of land. In all areas the VFT will pay fair prices for the land used. In the ACT the VFT will lease its right-of-way. The VFT will have an impact on the land holdings which it crosses: these will be alleviated by the frequent provision of underpasses or overpasses for livestock and farm vehicles. In some cases the advent of the VFT may make a portion or whole of a farm uneconomical to retain. In such cases the VFT will come to commercial arrangements with land owners.

Without government backing for land acquisition, it is likely that the VFT would face costly and protracted negotiations and legal proceedings about acquisition of the route. For this reason it is considered necessary for governments to legislate in support of the land acquisition process. A precedent exists in relation to pipelines built across privately owned land.

## ENVIRONMENTAL AND SOCIAL IMPACTS

The VFT will have a range of environmental and social impacts which are identified in the Concept Report. These will be the subject of further work during the feasibility study of the project. Some of the major impacts include:

- **Safety**

The safety record of high speed railways is outstanding. Since the Japanese Shinkansen started operation in 1964, 2.5 billion passengers have been carried and the number of deaths has been zero. By comparison, over a recent decade, the number of road deaths in Japan was 46,500. Similarly, the French TGV high



speed services which began operating in 1981 have an unblemished record.

The VFT will have safety standards no less stringent than those adopted on these overseas systems. It can therefore be expected that the VFT will have a beneficial safety effect for travellers in its corridor.

High quality security fencing will be provided along the route to ensure that neither people nor animals stray onto the tracks. The VFT will have no level crossings. To minimise the barrier effect of the security fencing, frequent underpasses will be provided for animal migration routes, for farm access and for local traffic.

- **Reduced Pollution**

Because of its fuel efficiency, referred to in section 3.3.2, the VFT will provide benefits from reduced atmospheric pollution. In addition, being electrically powered it will be less polluting than other modes of transport which use petroleum fuels.

- **Noise**

The VFT will yield an improvement to the noise environment of those areas close to the Sydney and Melbourne airports and the proposed second Sydney airport, as well as along the Hume Highway.

Reduction of the noise impact of the VFT will rely on two approaches. The first will be aimed at reducing the generation of noise at the source. Through improved design, the VFT is expected to be quieter than existing high speed trains operating elsewhere in the world.

The second main approach will be in the choice of the alignment of the VFT, which will be chosen so as to be as far away as possible from dwellings.

Other impacts identified in the report include:

- effects on urban parklands and infrastructure;
- impact on government-owned land;
- visual impact;
- national parks (noting that the currently planned route avoids both national parks and heritage areas identified by the National Trust and the Australian Heritage Commission);
- impact on mineral reserves;
- river and floodplain crossings; Aboriginal and heritage sites.

## INDUSTRIAL RELATIONS IMPACTS

The VFT regards the establishment of a satisfactory industrial relations environment and of effective industrial relations as critical to the success of the project. The uniqueness of the project will enable the opportunity to be taken to effect sound industrial relations policies and structures consistent with modern trends and to implement effective practices and procedures designed to promote employee involvement and industrial harmony.

## FEASIBILITY STUDY ACTIVITIES

The following are the principal activities in the feasibility study:

- route determination and alignment investigations; discussions with land holders
- environmental studies
- technical investigations and development
- railway operations studies
- market studies/marketing plan
- land acquisition processes
- determination of capital and operating costs
- analysis of associated businesses, e.g. communications, pipelines
- financial evaluation and project financing.

The Concept Report sets out an outline of a proposed environmental impact analysis, involving relevant environmental, social and economic issues. It would include a communications program, aimed at establishing two-way communication with people along the proposed route. The report also contains a proposed outline of the planning and environmental approvals process, and indicates the actions by governments which must take place in parallel with the VFT feasibility study program.

The most appropriate process for environmental and planning approvals is still being evolved, but in its current form it is based on the following steps:

- VFT produces a Concept Report (or Notice of Intent) that describes the project and identifies key issues for consideration by both government and the public.
- All four governments consider the report and agree to facilitate the planned feasibility studies. They set agreed and uniform EIS guidelines for the environmental study.
- The four governments may agree to set up a combined inquiry. This inquiry would review the environmental documentation as

it is produced during 1989 and 1990, and after a public exhibition period may conduct a public hearing.

- After considering the submissions, subject reports and other documentation, the inquiry would advise all four governments on the environmental impacts and the governments would then issue environmental and planning directives.
- Planning approvals would be embodied in the directives and would form the basis for State Environmental Planning Policies and land acquisition legislation.