The Maglev Alternative

Maglev Fast Rail	Regional Rail Link
$4.3 Billion	$4.3 Billion
500 km/h	160 km/h
Melbourne - Avalon – Geelong 15 minutes	Melbourne - Geelong 1 Hour
Melbourne – Airport 6 Minutes	

A proposal to swap the Regional Rail Link for a Maglev Fast Rail System

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www.MonorailsAustralia.com.au

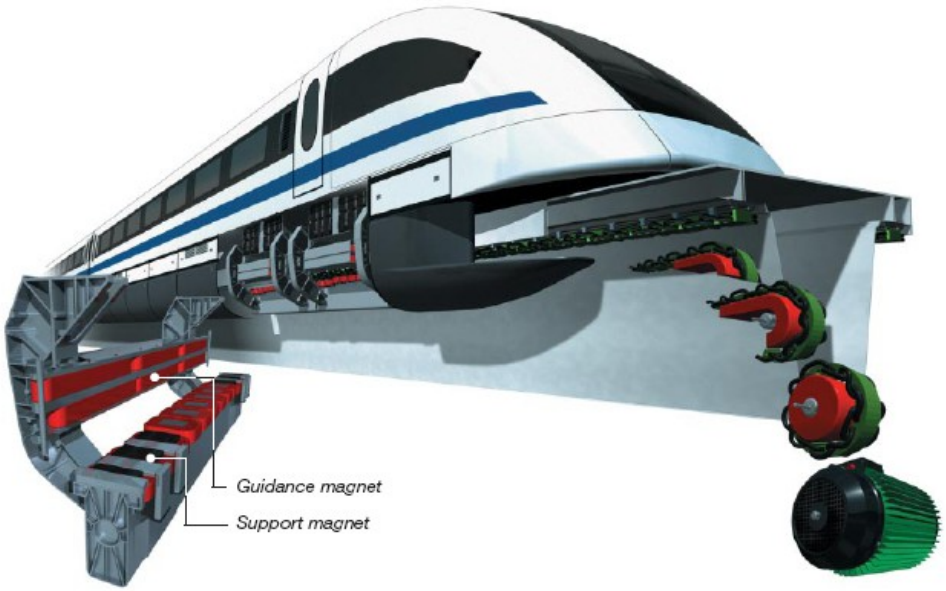
What is Maglev Fast Rail?

Instead of wheels, Maglev Fast Rail systems use magnets to levitate the train above the track. The track propels the Maglev train along the track at speeds of up to 500 km/h.

There is no friction between the train and the track, there are no overhead wires.

Inside the train the magnetic field strength is one tenth of the magnetic field of a hair-dryer. The train levitates using on-board batteries which can keep the vehicle floating for up to an hour without any mains power supply to the track.

Outside there is no noise from steel wheels on steel track, no sparking from overhead wires.



Maglev Fast Rail Advantages

- **Total Independence** – a Maglev system would not use any part of the existing rail system. Maglev trains will never have to wait for Metro trains to get into Southern Cross Station.
- **The Most Affordable Grade Separated System –** where no spare easement is available fast rail must be built on pillars or underground. Maglev track can easily be placed on pillars to cross existing road and rail networks.
- **Ease of Installation –** elevated Maglev track can be placed above road and rail easements. It could run across farm land to Avalon Airport.
- **Low Energy Consumptio**n – Maglev uses less energy then most other fast rail systems, and far less than road or air transport.
- **Lowest Maintenance Costs** – Because there is no contact between the track and the train and there are no overhead wires Maglev maintenance costs are much less than other fast rail systems.
- **Higher Grades, Tighter Corners** – Transrapid Maglev can accommodate steep grades up to 10% compared to 4% for conventional trains. This means Maglev's can be placed on freeway median strips or alongside existing tracks. Conventional fast rail systems (E.g. French TGV or German ICE trains) would have to have a whole new easement.
- **The Fastest System** – At up to 500 km/h Maglev is the fastest fast-rail system available. Maglev's can reach 300 km/h in 104 seconds – more than 3 times faster acceleration than conventional fast trains.
- **Safety** – Maglev trains are fully grade-separated. The trains wrap around the track so cannot de-rail. Trains are fully automated.

Costs

In 2008 one of the Maglev manufacturers, Transrapid, quoted $4 Billion for a dual-track Maglev all the way from Geelong to Frankston via Melbourne Airport.

This was comprised of:

- $34 Million per kilometre for double track.
- $16.5 for commuter carriages up to $20 Million for luxury carriages. Trains may have up to 10 carriages.

These figures were confirmed to me on the 30th October 2010 by Peter Hatcher, General Manager of ThyssenKrupp Transrapid Australia.

This is highly competitive with other transport systems such as conventional rail or motorways and far cheaper than Melbourne's proposed Footscray - Domain rail subways systems ($900 million+ per km).

Suggested Routes

Elevated Maglev is able to easily traverse existing roads, railway lines, farmland and industrial areas.

Most of the suggested Maglev routes would be along existing rail easements or freeways with the Southern Cross Station above Wurundjeri Way.

At Footscray the Maglev track would need to be over the existing rail tracks and elevated above Hopkins, Nicholson & Albert Streets.

The Geelong Maglev could travel south from the existing rail line at Tottenham across industrial land to the Geelong Freeway and then follow the Freeway to Avalon Airport before going on to Geelong.

The Airport Maglev continues through Sunshine and then follows the Western Ring Road North to enter the southern boundary of Melbourne Airport near Airport Drive. The airport station could be between the main airport building and the Hilton Hotel. (This could later be extended to the Hume Freeway towards Sydney.)

(Building the maglev over CityLink to the airport may be feasible but would result in the loss of the central lanes of the existing motorway as there is no median strip. Assuming this is unacceptable a route using the Western Ring Road is suggested here.)

Suggested routes for the Geelong and Airport Maglev tracks.

Inter State Extensions

The proposed system is valid as a 'stand alone' Victorian network or the start of an inter-State fast rail system. Unlike conventional steel-wheel fast rail systems a Maglev system could use the existing Freeway median strips for much of the distance. Existing freeway reservations can be used from Melbourne Airport to the Hume Freeway.

A Maglev train could reach Sydney in two hours.

Existing Maglev Systems

- The Emsland test track has operated since 1984.
- The 30 kilometre Shanghai airport Maglev has operated since 2004. The top operational commercial speed of this train is 431 km/h, making it the world's fastest train in regular commercial services.

The 53km Melbourne-Avalon section of a Melbourne Maglev system could operate at up to 500 km/h making it the world's fastest train.

Station Design

To minimise dwell times I suggest that platforms be provided on each side of the train at the station as shown above at Shanghai. Passengers could then board from one side and alight from the other.

All platforms should have platform railing as shown above. All platforms should be capable of accommodating the ten carriage Maglev trains, or be able to be extended to this length at a later stage. Unlike the manual operated rope barriers on the Shanghai system automatic gates would be used.

Southern Cross Station

The Maglev station would be above Wurundjeri Way and be integrated into the existing station complex. Two Maglev tracks would be serviced by three platforms which would become Southern Cross Station platforms 17, 18 & 19. The wide central platform 18 would be for passengers departing for Melbourne Airport or Geelong on either track. Platforms 17 and 19 would be for incoming passengers to alight from Maglev services.

Other Stations

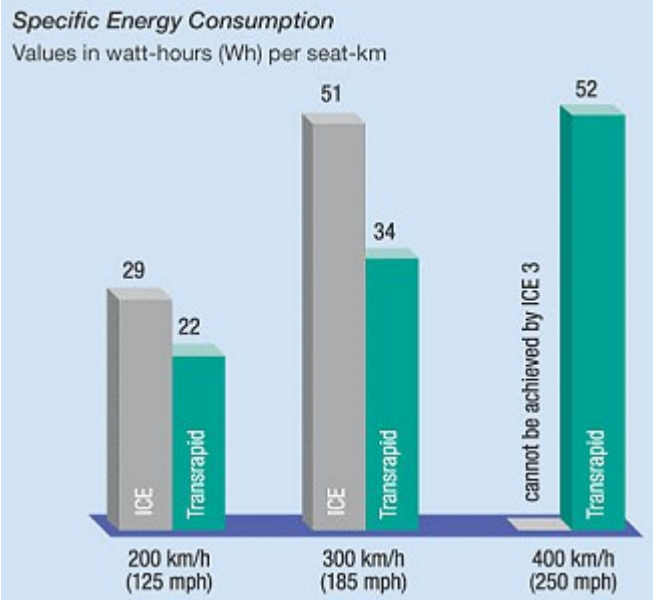
The three-platform configuration described above is recommended for the other three stations to avoid boarding passengers having to wait for alighting passengers to get off the train.

Operation

Maglev systems have low running costs due to the low power consumption and the lack of contact between the train and the track.

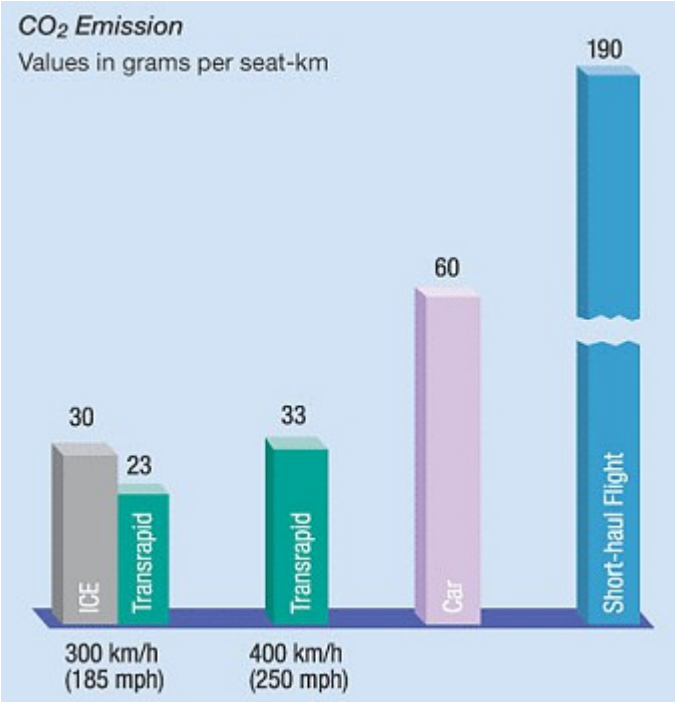
For this reason ticket prices should fall within the normal range of existing Metro or V/Line tickets. Day-to-day operation of the system could be managed by Metro or V/Line.

High Energy Efficiency



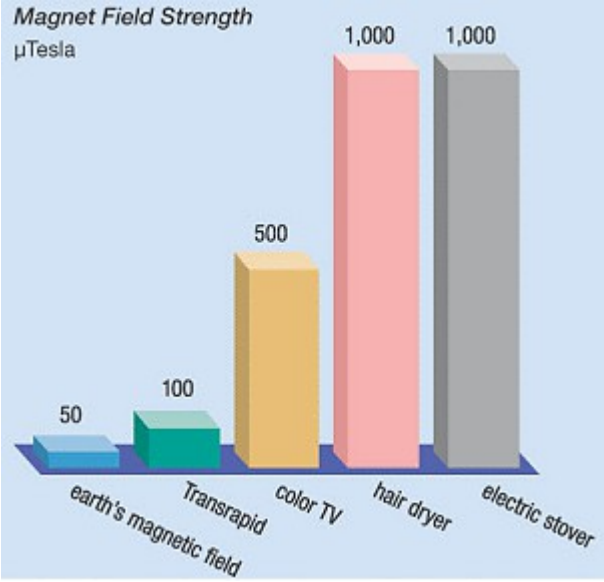
Transrapid energy efficiency compared to German ICE conventional steel-wheel fast trains.

Low Greenhouse Emissions



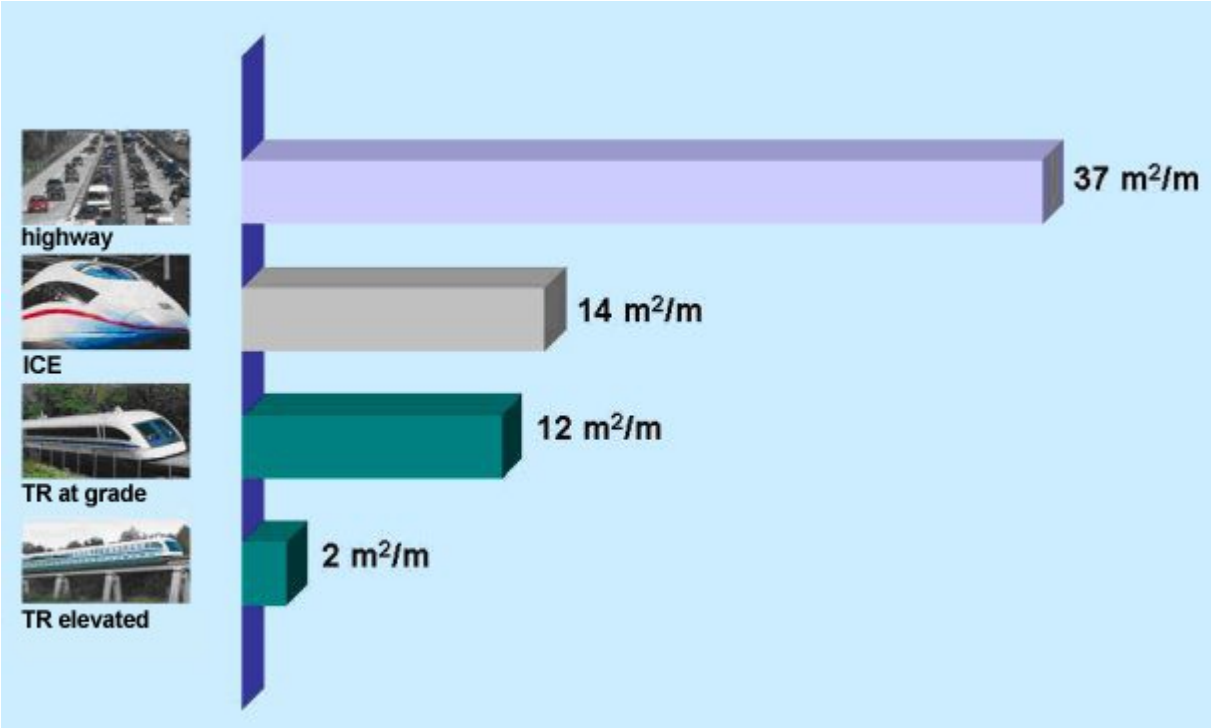
Transrapid CO_2 emissions compared to German ICE conventional steel-wheel fast trains, cars and aircraft.

Low Magnetic Field Strength



Transrapid magnetic field strength inside the cabin compared to a hair dryer and other domestic appliances.

Low Land Usage



Transrapid system land use compared to motorways and German ICE conventional steel-wheel fast trains.

High Gradients

As the Transrapid is capable of climbing steep gradients (ten percent compared to four percent for normal railroads) and able to handle tight curves (1950 meters at 300 km/h compared with 3200 meters for normal railroads), it is possible to flexibly adapt its guide way to the landscape and to have it tightly follow existing roads, railroad tracks, and power lines.

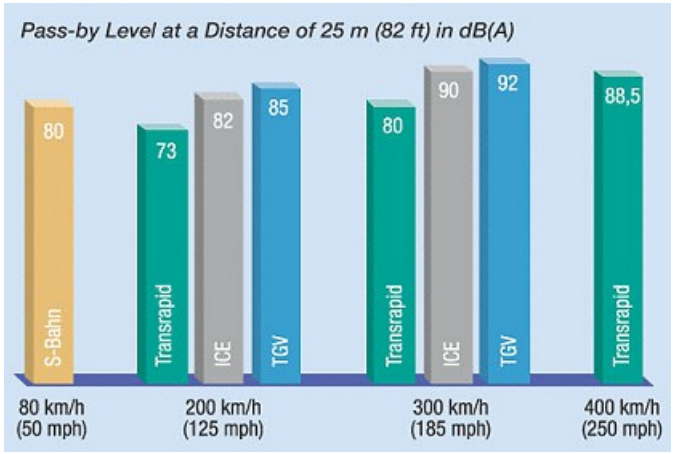
Air Turbulence

When the Transrapid passes by it generates minimal turbulence. Thanks to the aerodynamic optimization of the Transrapid vehicle, there is nothing more than a slight gust at a distance of 2 meters when the Transrapid passes by at a speed of more than 380 km/h. There is no perceptible air movement under the elevated guide way and the air movement produced by the vehicle on at-grade guide way at a speed of 330 km/h is only as strong as a moderate wind.

This means the Transrapid system could be placed along motorway median strips without impacting vehicles on the motorway. (Note that even 'at grade' Maglev track is elevated about 1 to 1.5 meters.)

Low Noise

At speeds around 200 km/h, you can hardly hear the Transrapid. It can quietly hover through cities and urban areas because with to its non-contact technology, there is neither rolling nor engine noise. At higher speeds, there is only the noise of the wind. At 300 km/h, the Transrapid Maglev vehicle develops less noise than a truck, and even at speeds above 400 km/h, it is not much louder than considerably slower railroads.



Flood Proof

Because Maglev track is elevated the Maglev system would be unlikely to be affected by flooding.

The proposed Regional Rail Link will be highly vulnerable to flooding as for long sections it runs in a channel.

Videos and Brochures

Please see our website for the following:

Flying on the Ground

The Emsland Test Track

Transrapid Quote for Melbourne System (2008)

Contact

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