



Thursday 27th July 2023

Rail Interest Group

Melbourne High School

Forrest Hill, South Yarra, VIC 3141

The benefits of urban passenger rail

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Public Transport Research Group

Monash Institute of Transport Studies

Monash University, Australia



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TRANSPORT
STUDIES



Introduction

Capacity

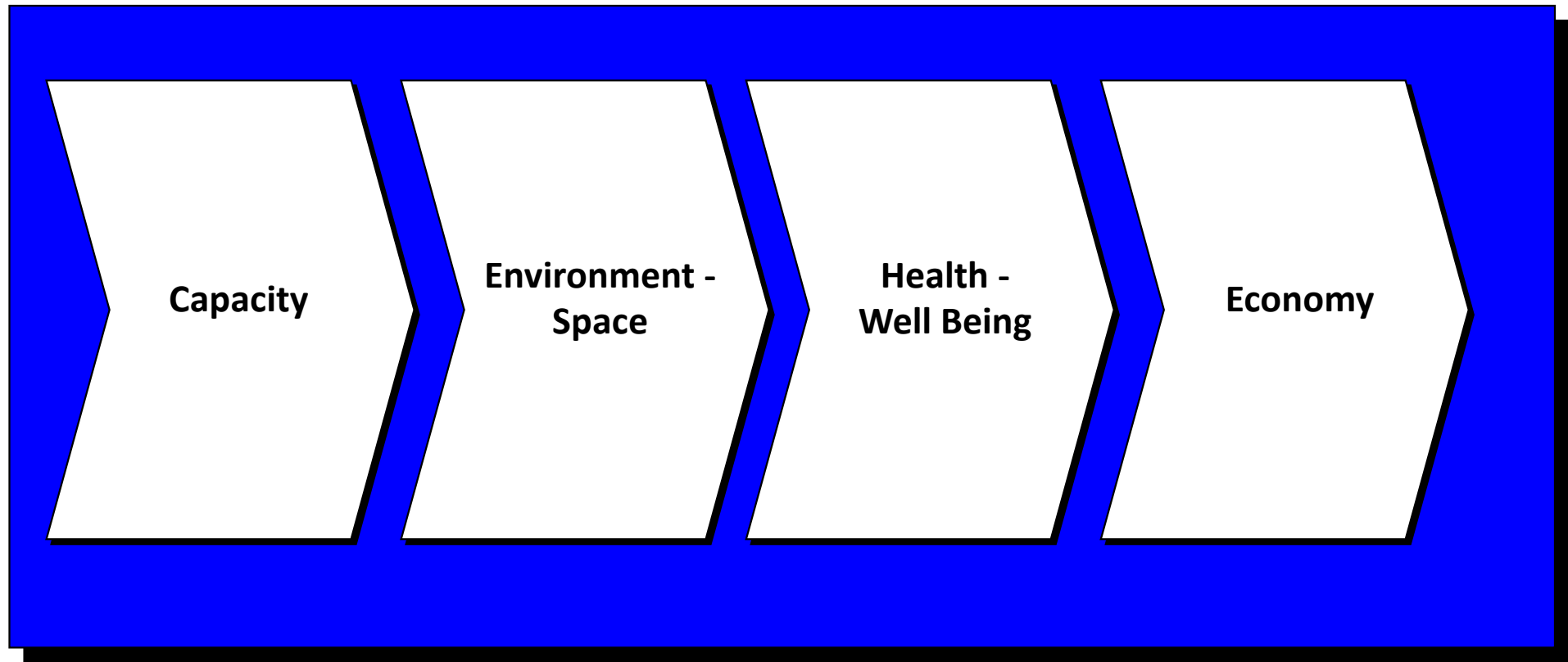
Environment – Space

Health – Well Being

Economy



This presentation outlines the benefits of urban passenger rail



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Capacity

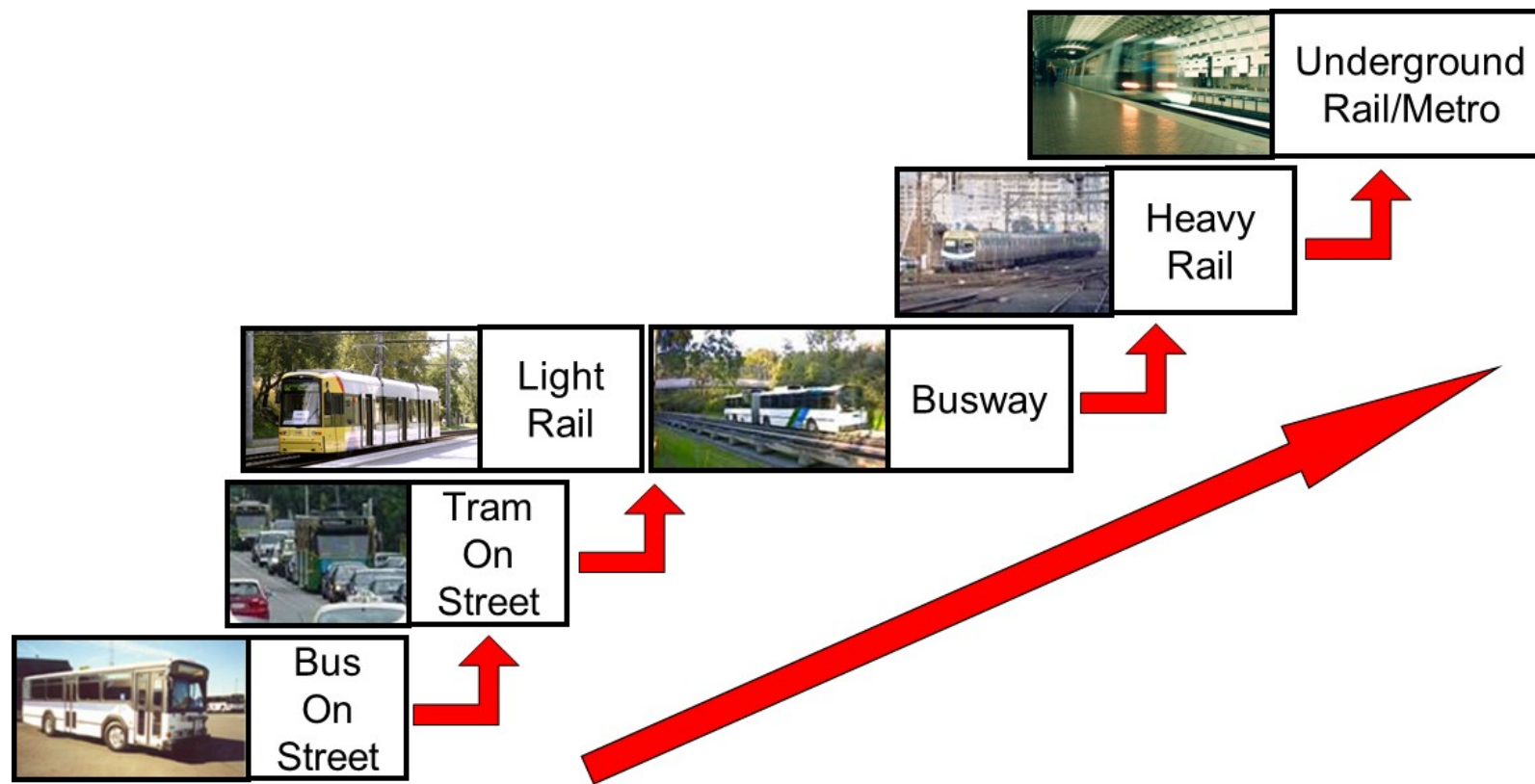
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There is a pecking order in urban transit and rail is at the top



Engineering studies demonstrate significant line capacity and speed advantages of Rail vs other modes – Cities have NO practical choice other than Rail for capacities above 20Kphpd at speed

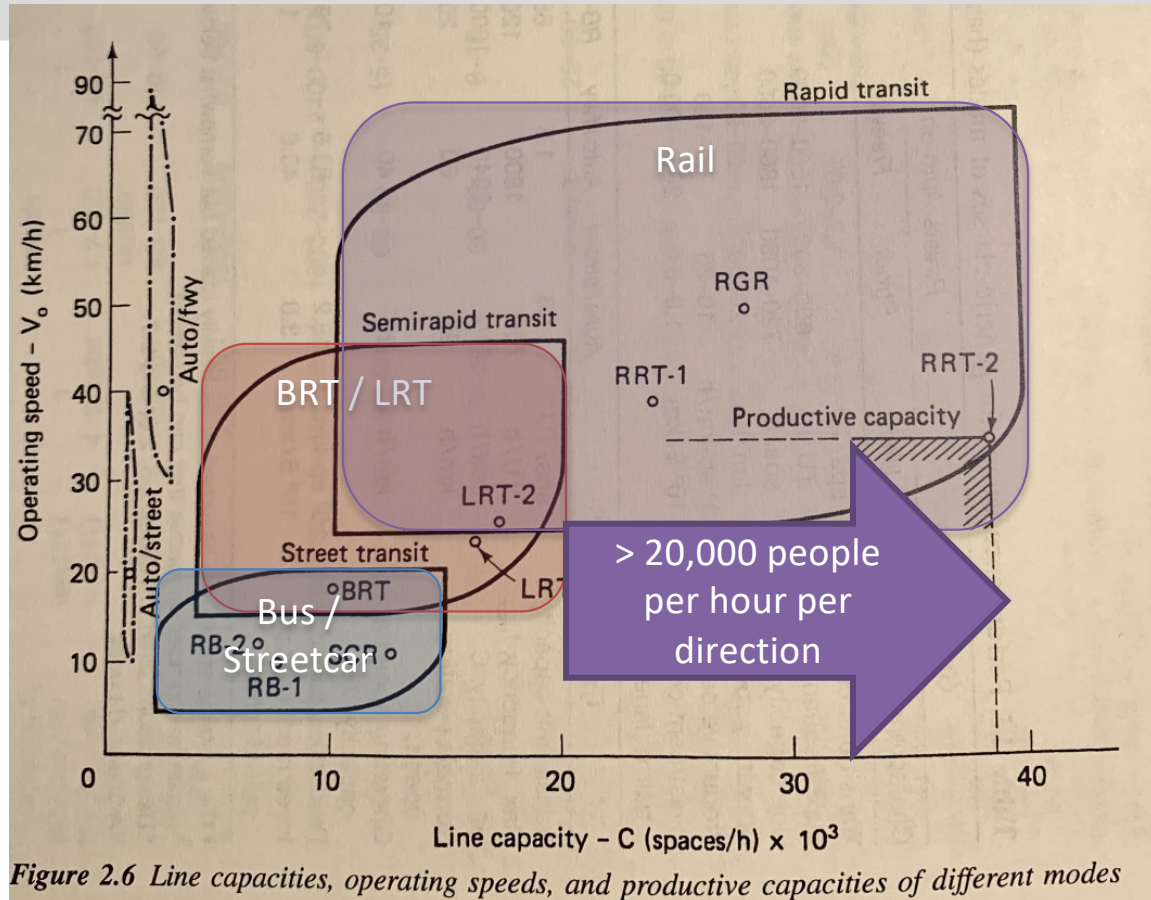


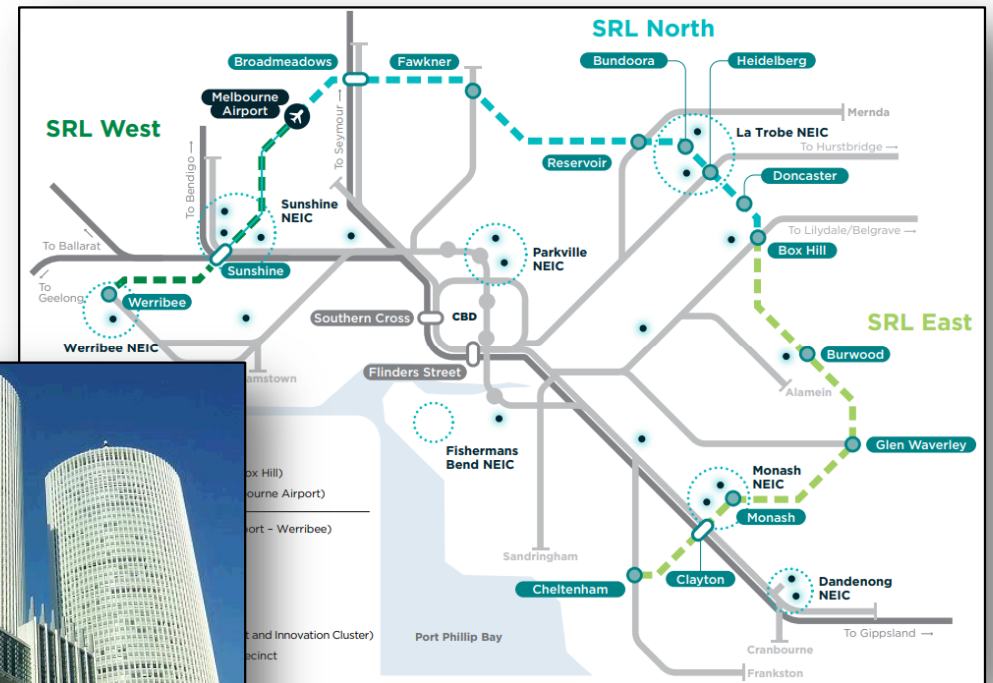
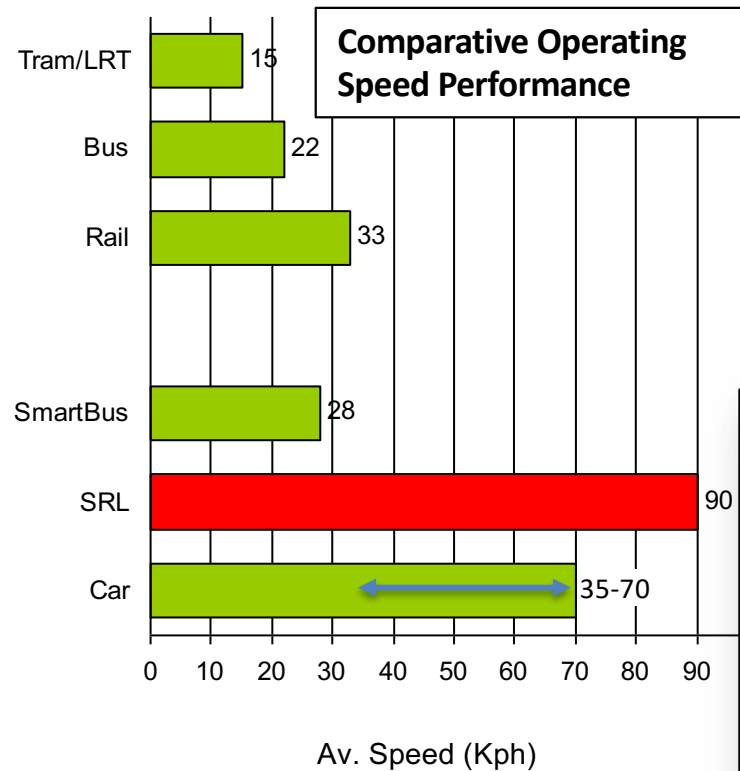
Figure 2.6 Line capacities, operating speeds, and productive capacities of different modes

Note:

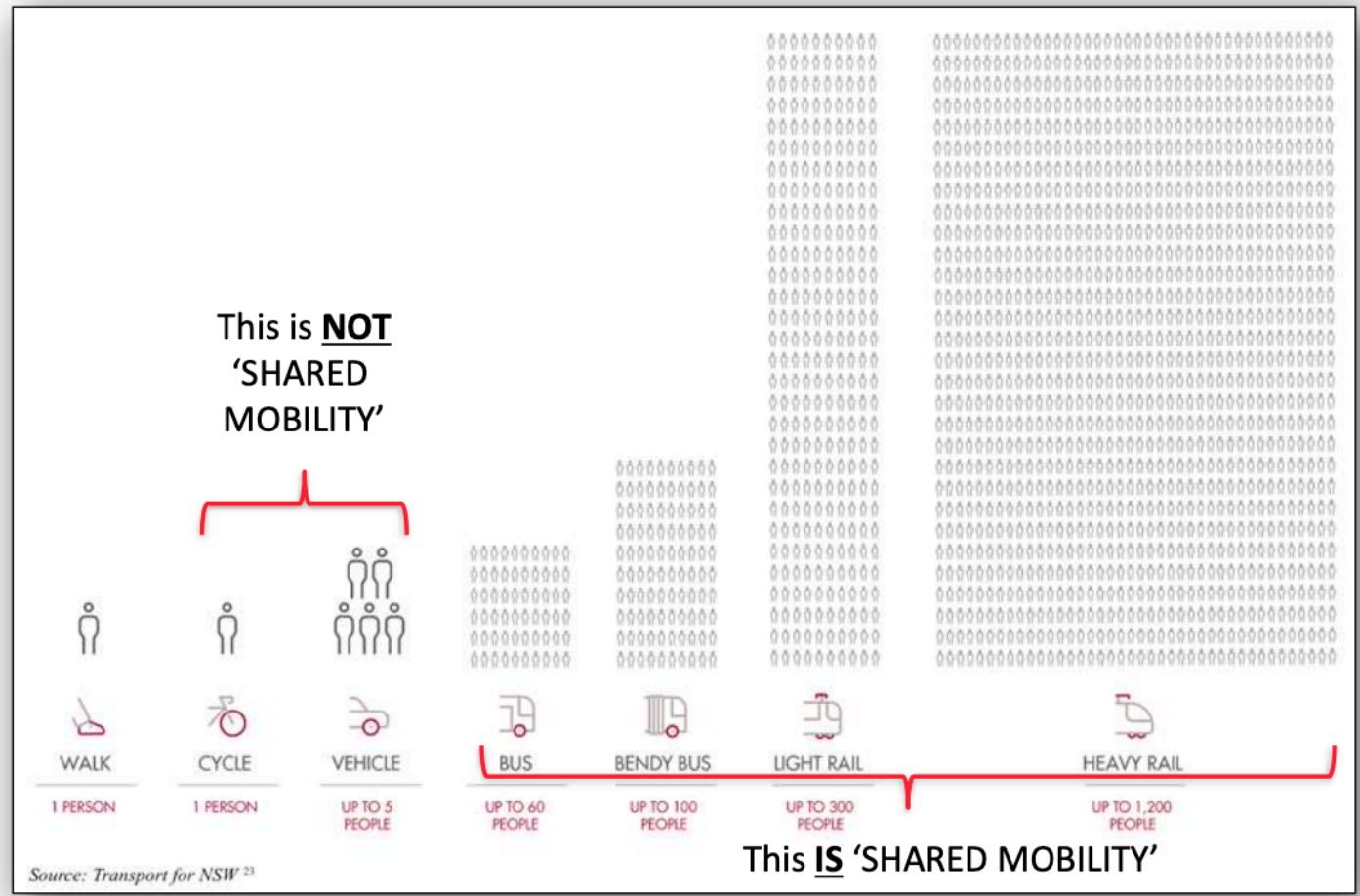
(1) Vuchic V.R., (2007) Urban Transit; Systems and Technology (p.78)



Rail is also very competitive with the car; something bus even SmartBus cannot achieve – it also has significant urban density generation benefits



As cities grow; we have no choice but rail for high volume efficient movement





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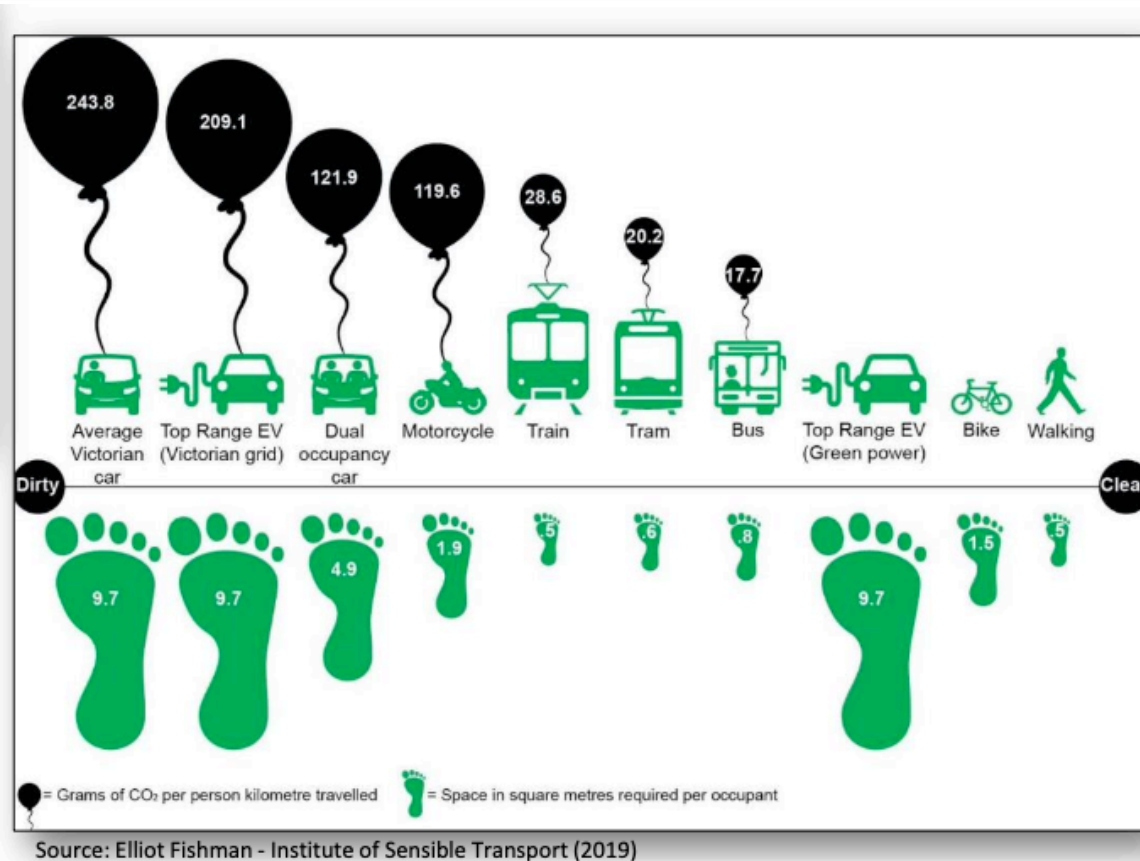
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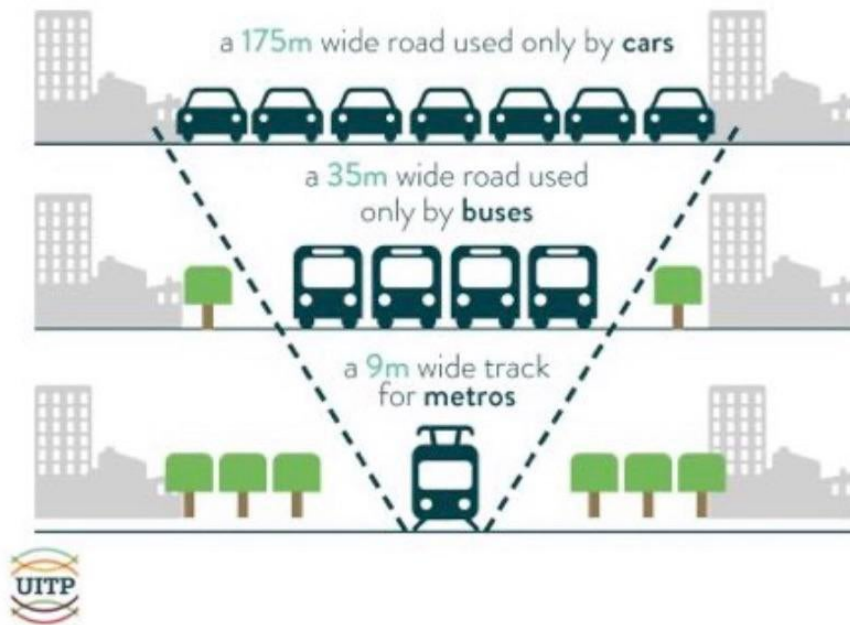


Rail combines the most environmentally efficient mode for longer distance travel with the most space efficient travel



A 9M rail right of way carries 50,000 pax/hr compared to a 175M wide road

To carry 50,000 people
per hour per direction,
a city needs...





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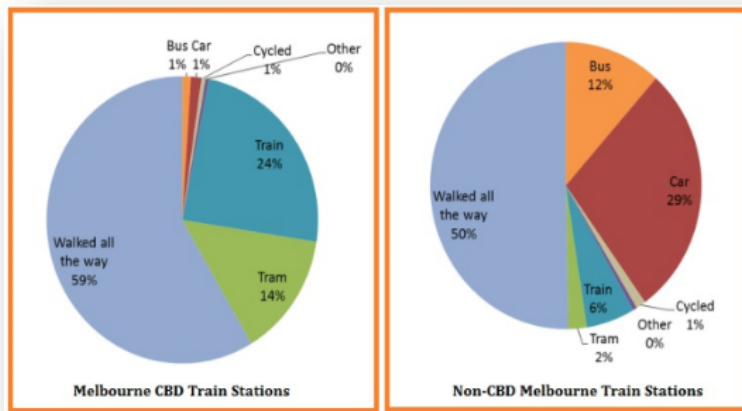
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Health – Well Being

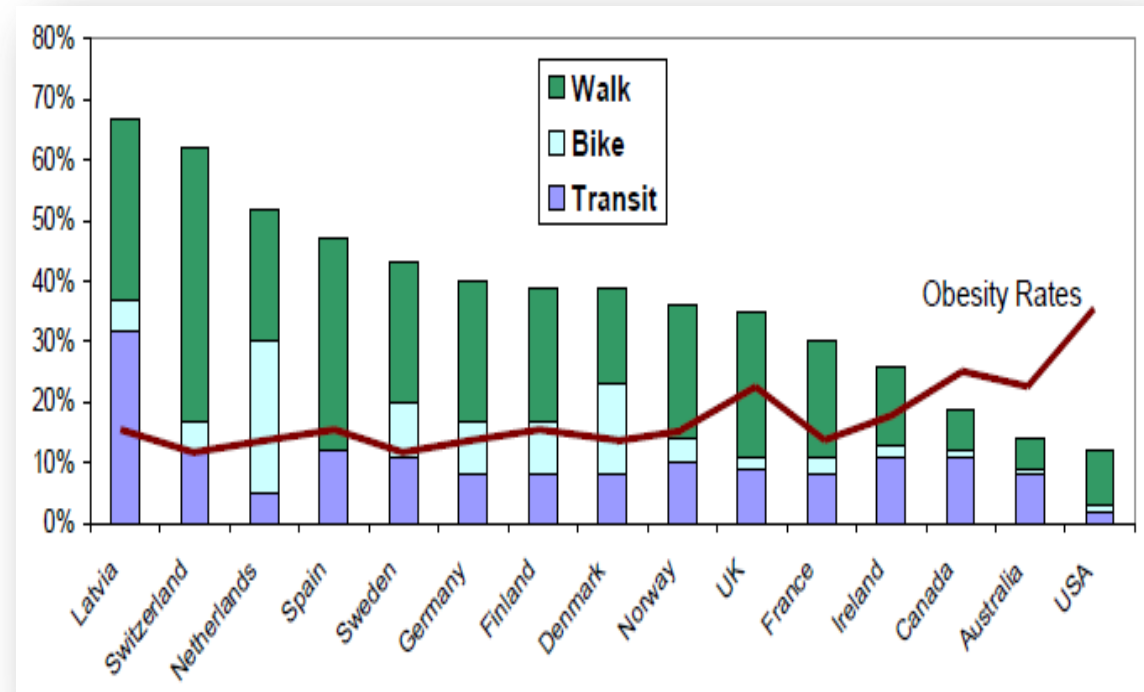
Economy



Rail travellers have to walk so are more physically active – more transit use reduces obesity rates

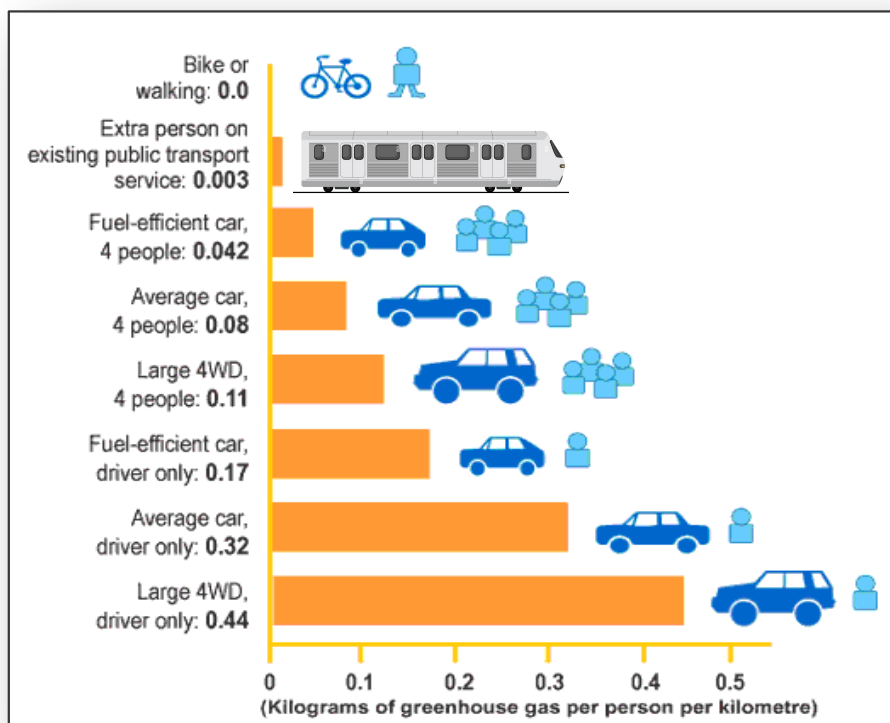


*Access modes to train stations in Melbourne.
(PTV OD Survey, 2011-2012)*



*Mode Split Versus National Obesity Rate
(Bassett, et al 2008)*

Environmental benefits of rail link to health benefits

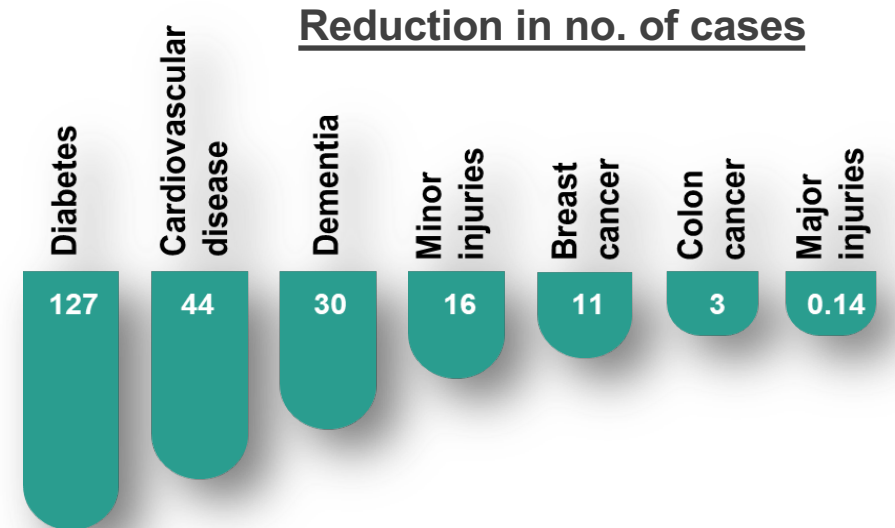
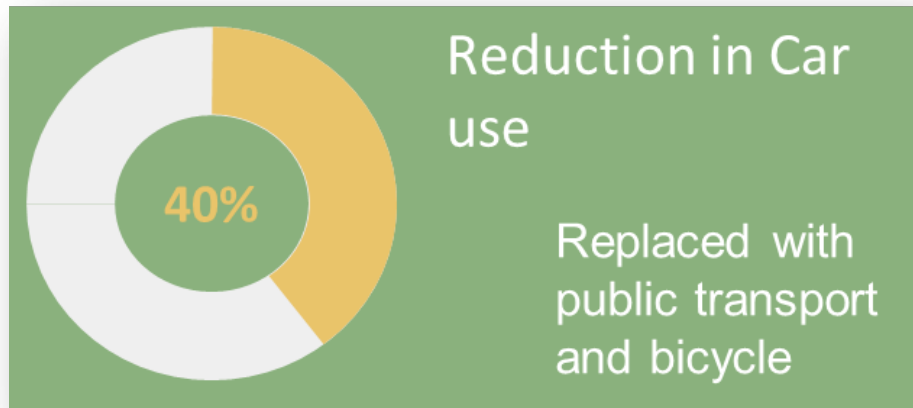


*Greenhouse gas emissions from different transport modes
((Transport State Transit, 2014)*

	Change in disease burden	Change in premature deaths
Cardiovascular Dis.	6-15%	724-1895
Diabetes	6-15%	73-189
Depression	2-6%	<2
Dementia	2-6%	38-132
Breast cancer	2-5%	15-48
Colon Cancer	2-6%	17-53

*Change caused in diseases and premature deaths from forecast
reduction in Greenhouse Gas Emissions
(Maizlish 2011)*

Rail mode shift creates health benefits



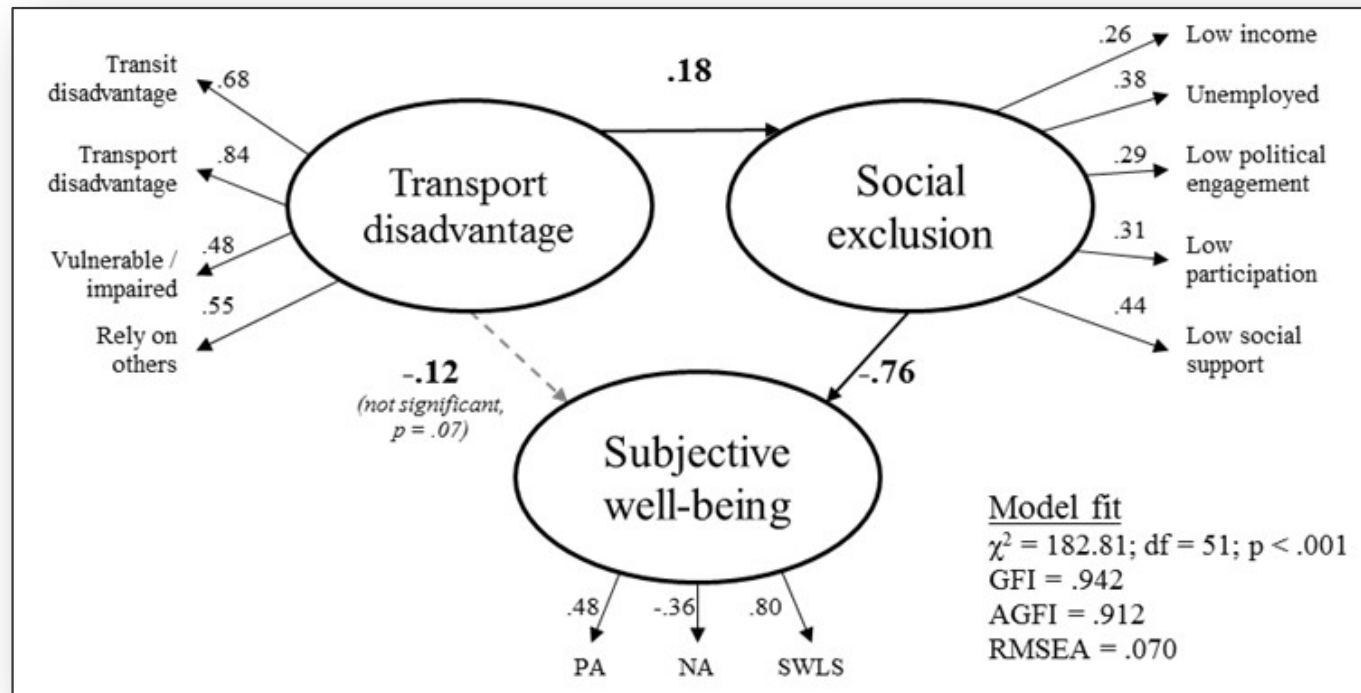
Morbidity results (cases/year)

This change has reduced PM_{2.5} exposure and resulted in annual reductions of

- 7 cases of low birth weight
- 6 of preterm birth
- 1 of cardiovascular disease
- 1 of lower respiratory tract infection

This study is based on the data from the 2009 traffic conditions reported by Barcelona City Council. 8 scenarios were developed to compare the reduction of car uses with the 'business as usual' scenarios. (*Rueda et al., 2013*)

Rail improves mobility for the disadvantaged; this links indirectly to psychological well being



*Transport Disadvantage, Social Exclusion and Well Being
(Currie and Delbosc, 2010)*

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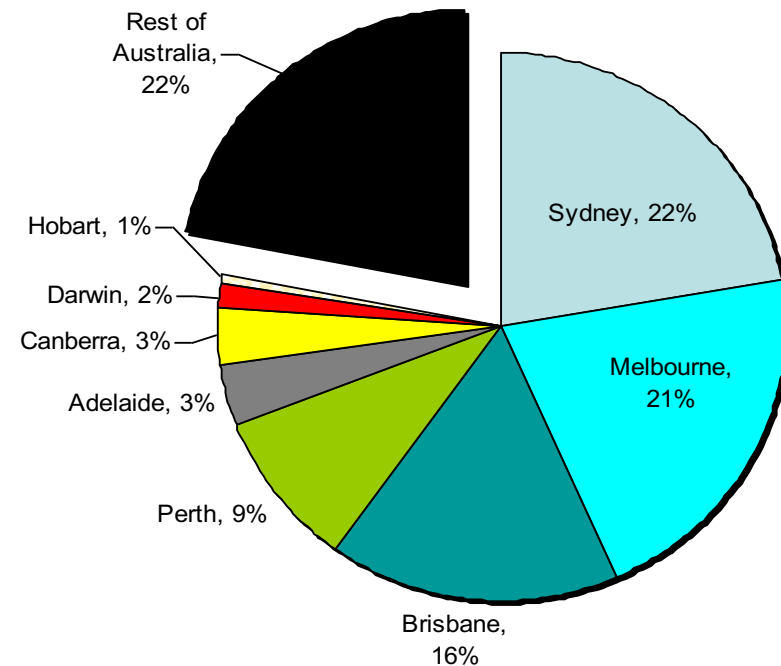
Health – Well Being

Economy



Australian cities dominate national economic growth

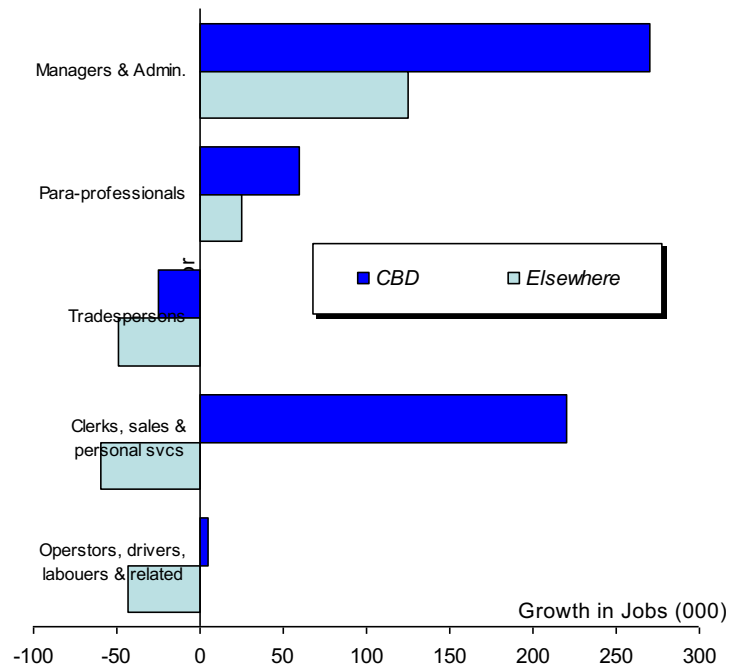
- Australia's national economic well-being is increasingly dependent on its capital cities –
- 61% of Australia's economic activity in 2006 took place in Sydney, Melbourne, Brisbane and Perth
- and these cities contributed 78% of Australia's economic growth during the last five years



Source: Australian National Accounts, Australian Bureau of Statistics
Council of Capital City Lord Mayors, 2007

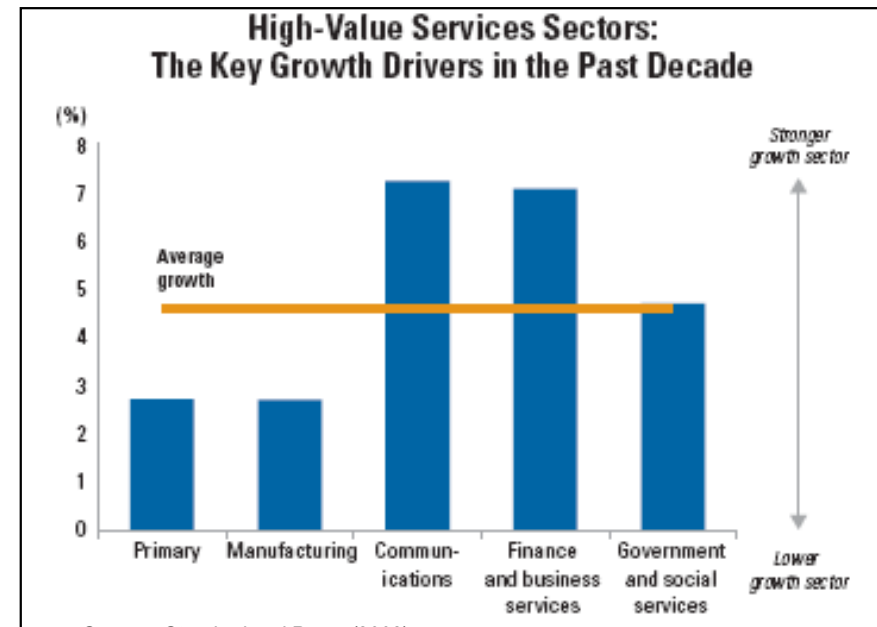
CBDs and CBD businesses dominate this growth

**Growth in Jobs by Sector -
Melbourne CBD/Non CBD (1981-1991)**



Source: Brottchie et al. (1995)

Growth Drivers – Melbourne (Decade)

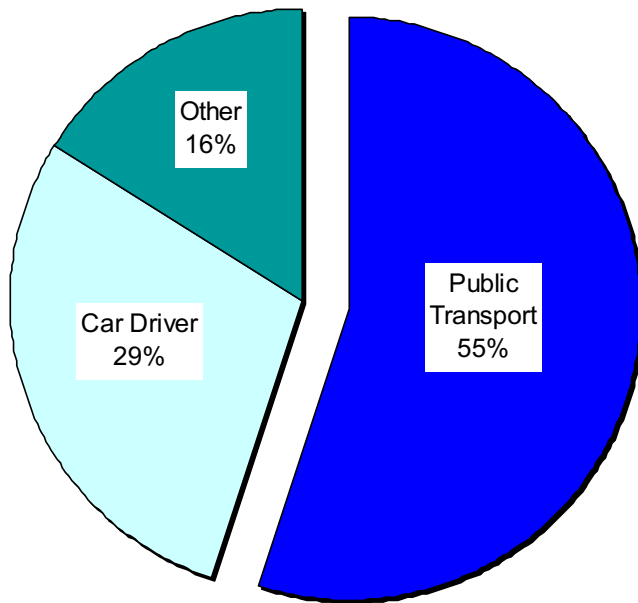


Source: Standard and Poors (2003)

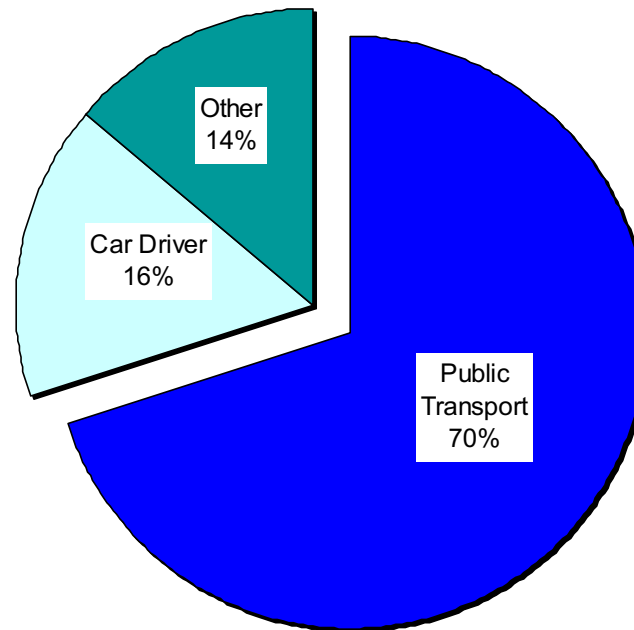
Australian rail dominates CBD access

Access Mode Share to Work

Melbourne



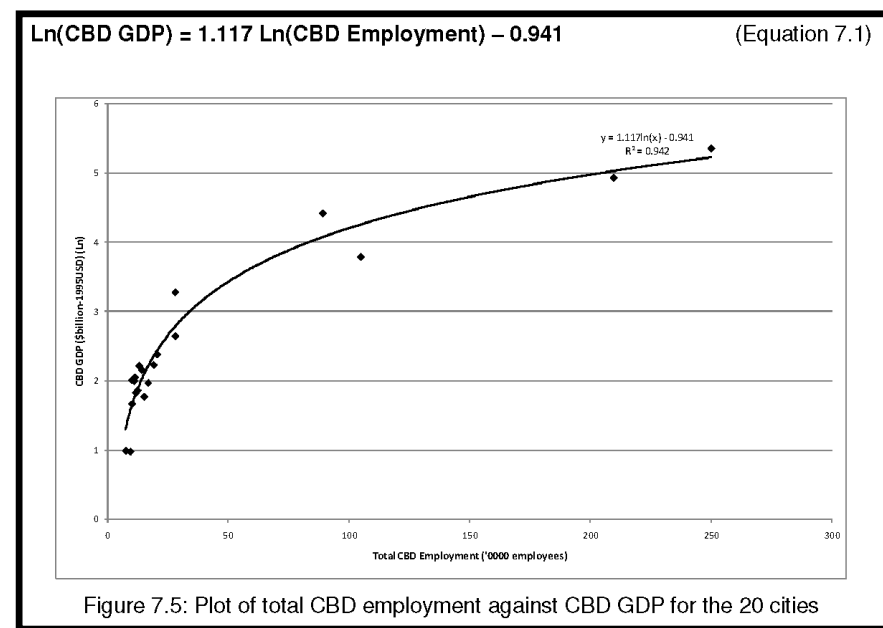
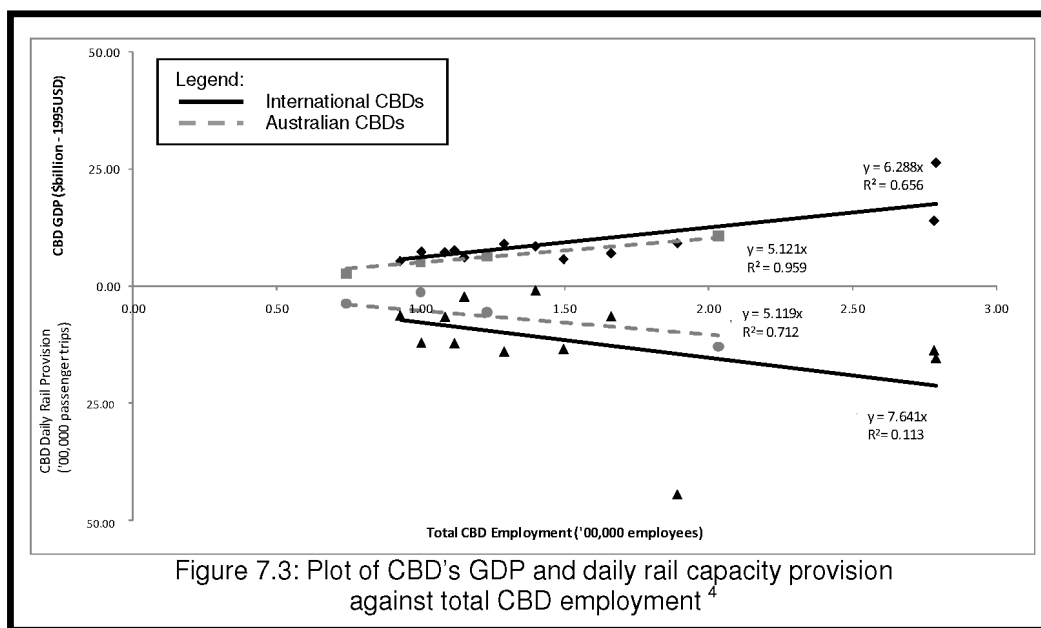
Sydney



Source: ABS Census 2006

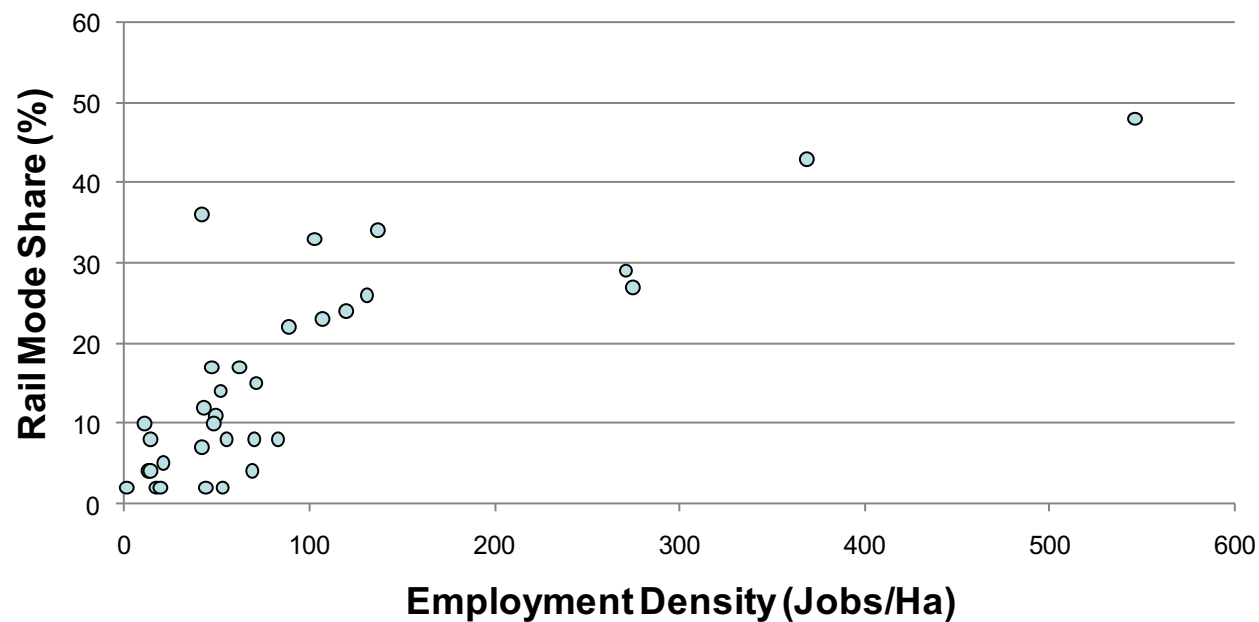
Economic productivity grows as employment density increases in cities

Agglomeration Benefits – Increase Employment Density in CBDs



Source: Gwee TM (2010) 'Exploring the Economic Impacts of Agglomeration Economies in Urban Rail Projects' Monash University PhD Thesis

Rail dominates high employment density in Australian cities



Source: TransFigures - Employment and Commuting in Sydney's Centres, 1996 – 2006 NSW Transport Data Centre Dec 2008



Please reach out for more information

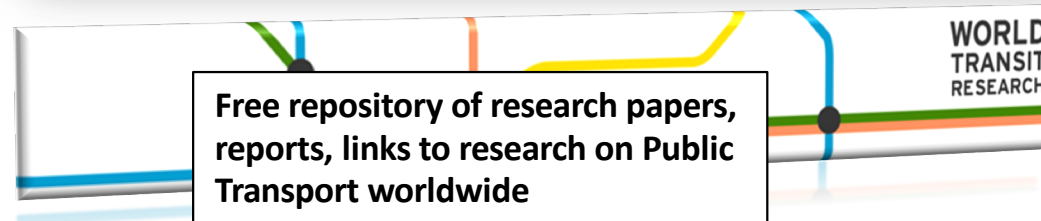
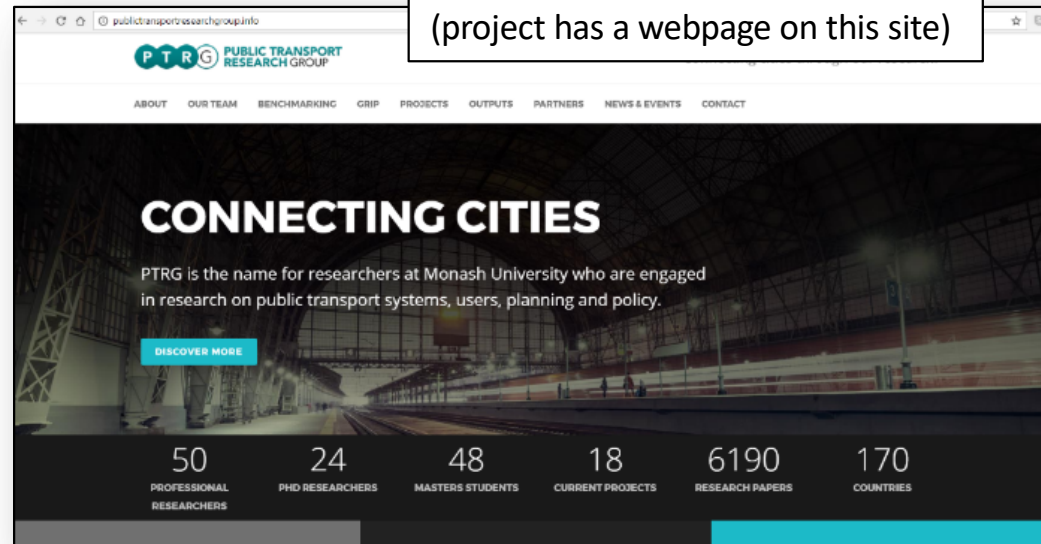


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Connect with us on



W: ptrg.info
(project has a webpage on this site)



Researching Transit



**RT5 – Long term
impact of COVID-
19 on Travel
Behaviour**

