

Melbourne Buses, Bus Ridership Growth and LGA Data

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Institute of Transport Studies (Monash)

The Australian Research Council Key Centre in Transport Management



Introduction

Transport Melbourne & Buses

Bus Ridership Growth

LGA Data



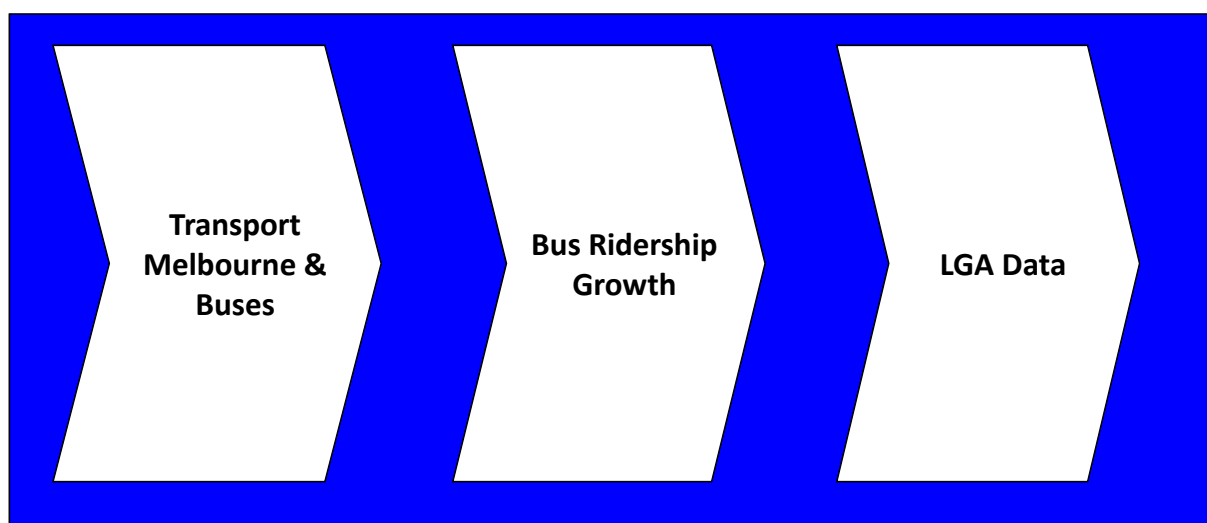
This papers look at Melbourne transport problems and buses, bus ridership growth, and LGA data...

Issues Covered

- What are the major public transport problems in service provision and development with a focus on buses
- What can be done to increase bus ridership
- How our new LGA data might help



...and is structured as follows



Introduction

Transport Melbourne & Buses

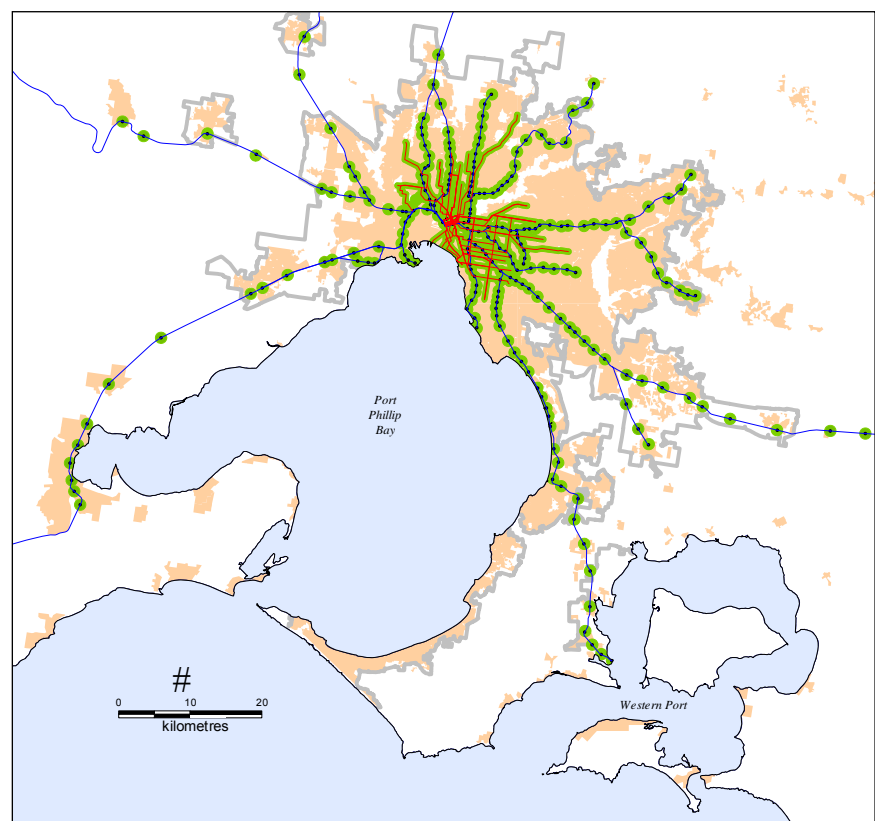
Bus Ridership Growth

LGA Data



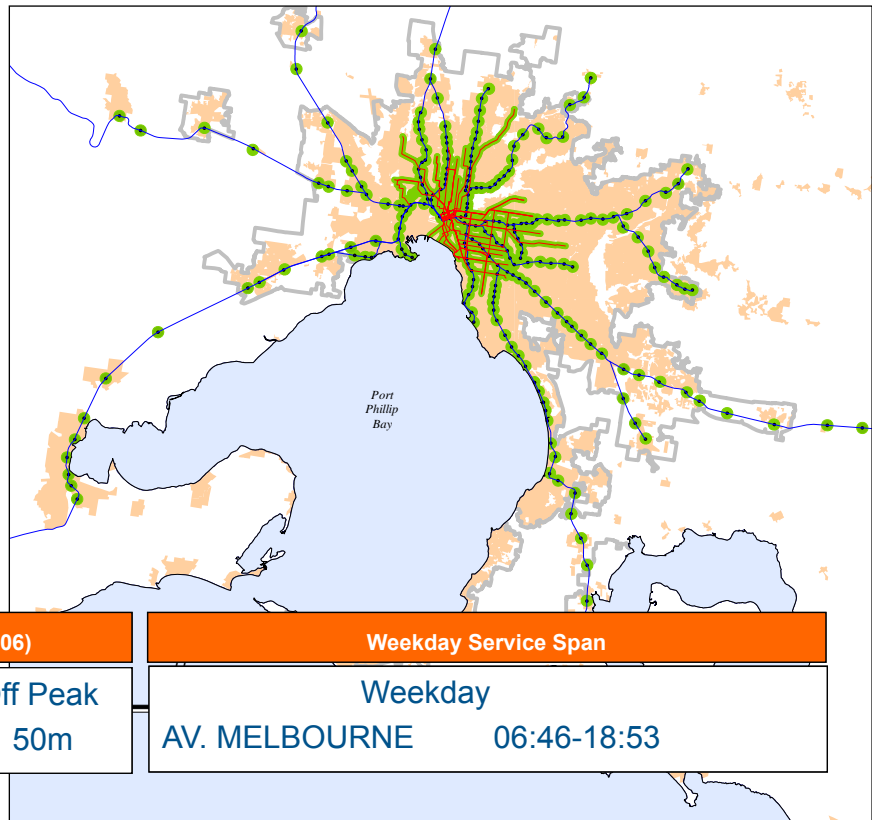
Buses ARE Melbourne's public transport for most residents, which is a problem....

- Over two thirds of Melbourne can only be serviced by bus services since rail and tram services lie considerable distances from where people live or where they want to travel to
- In 1996 the Metropolitan strategy team identified that 2.16M Melbournians lived in areas where buses were the only means of access to public transport. 0.98M lived within access distance of rail services



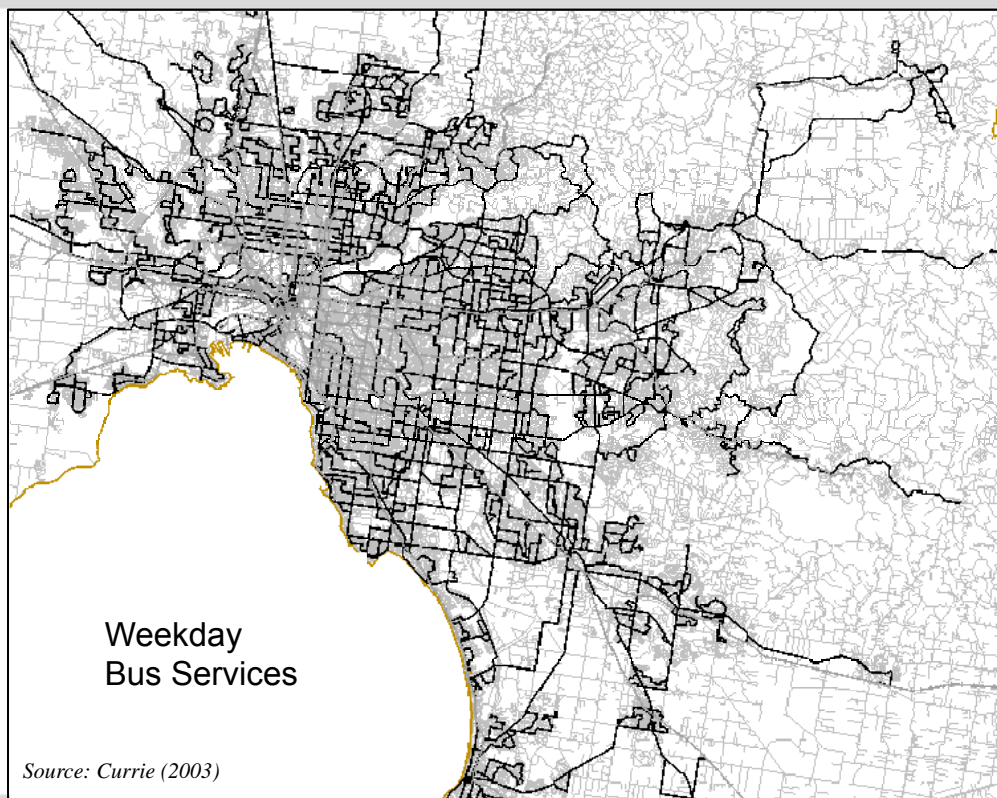
...because there aren't many

- Over two thirds of Melbourne can only be serviced by bus services since rail and tram services lie considerable distances from where people live or where they want to travel to
- In 1996 the Metropolitan strategy team identified that 2.16M Melbournians lived in areas where bus was the only means of access to public transport. 0.98M

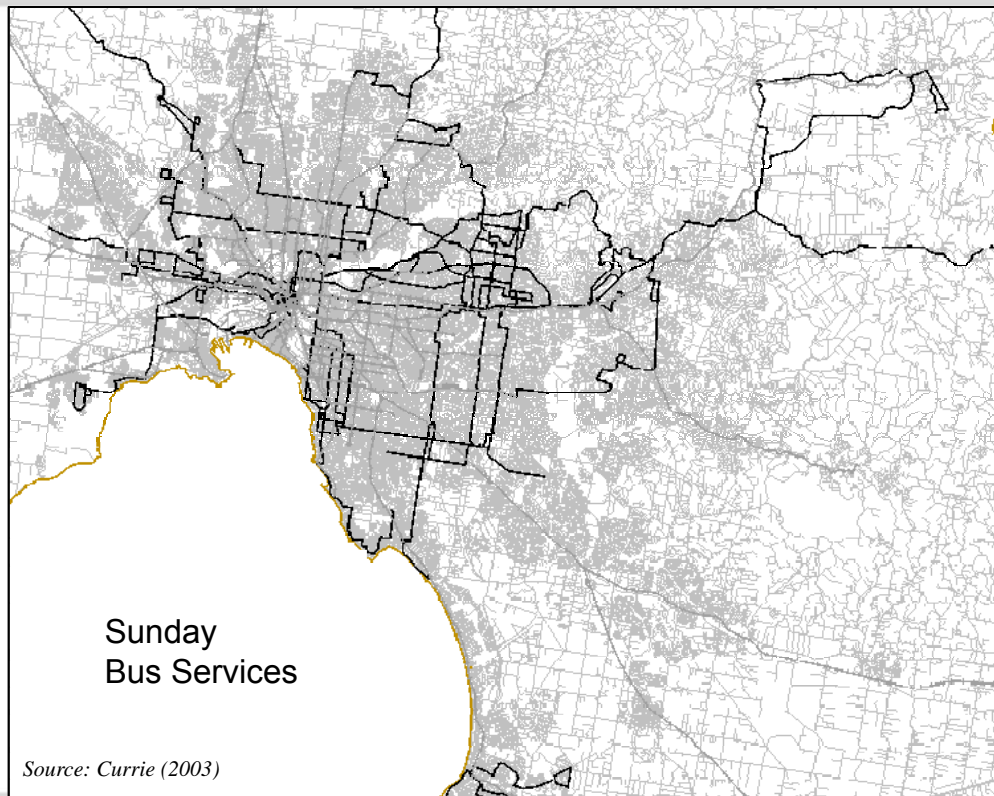


Weekday Service Frequency (2006)			Weekday Service Span	
	Peak	Off Peak	Weekday	
AV. MELBOURNE	40m	50m	AV. MELBOURNE	06:46-18:53

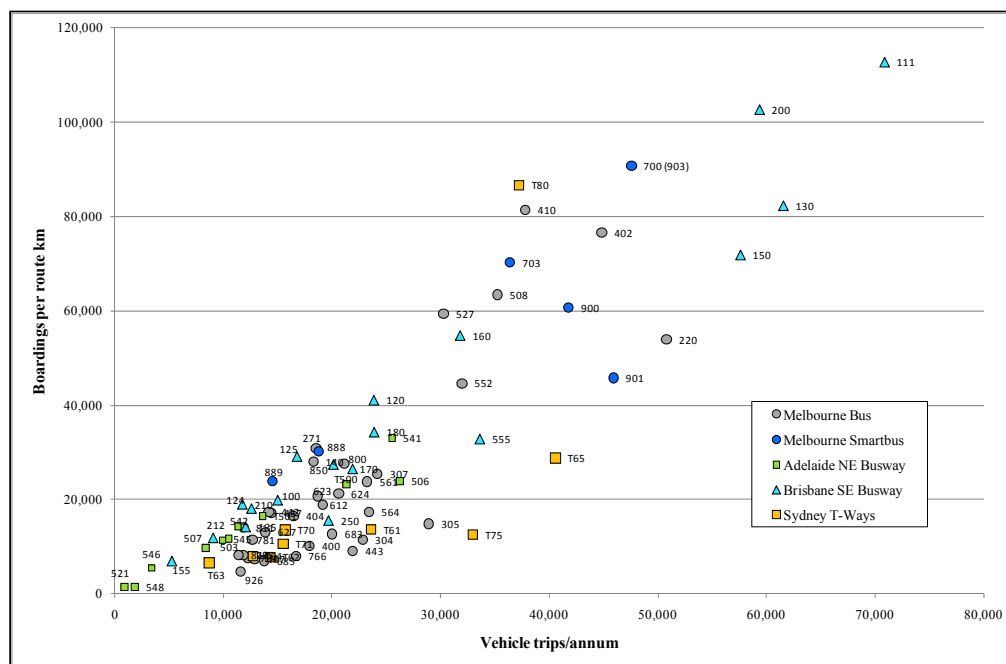
The bus network on weekdays...



...contrasts somewhat with weekends

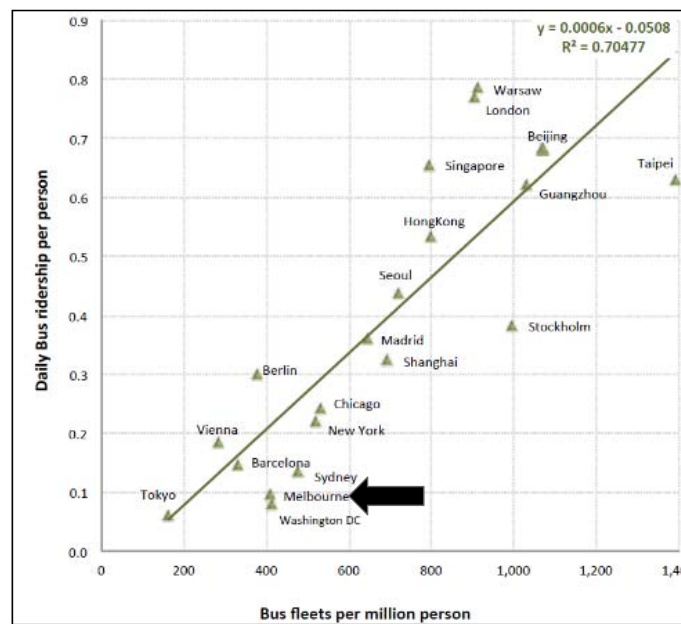


Frequency drives Australian ridership performance



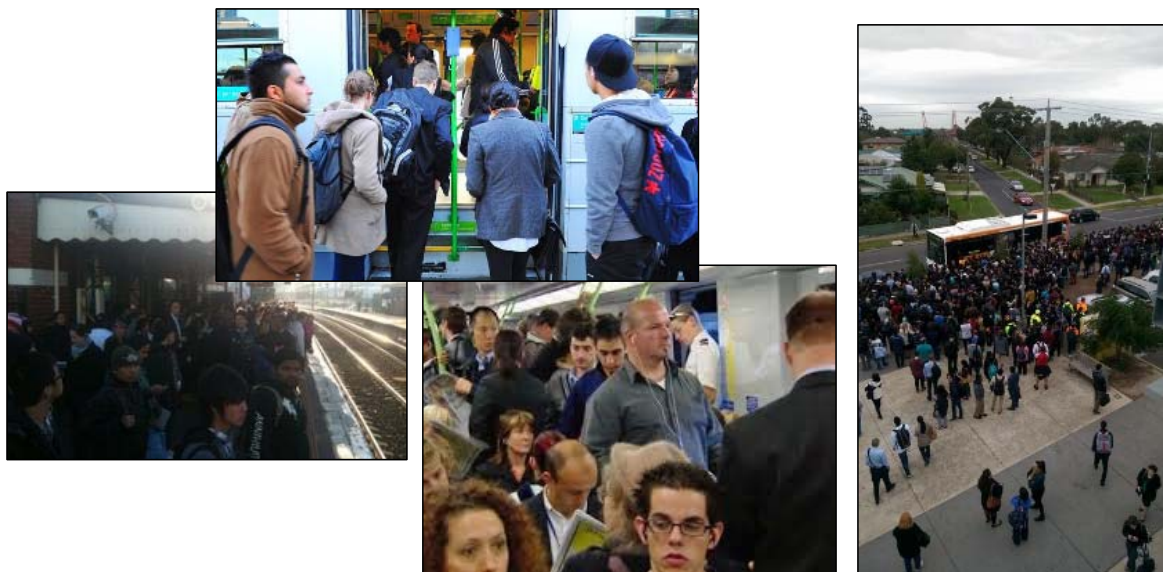
Source: Currie, G. and Delbosc A (2011) 'Understanding bus rapid transit route ridership drivers: An empirical study of Australian BRT systems' TRANSPORT POLICY Volume 18, Issue 5, September 2011, Pages 755-764

In general our bus service level is poor compared to world practice

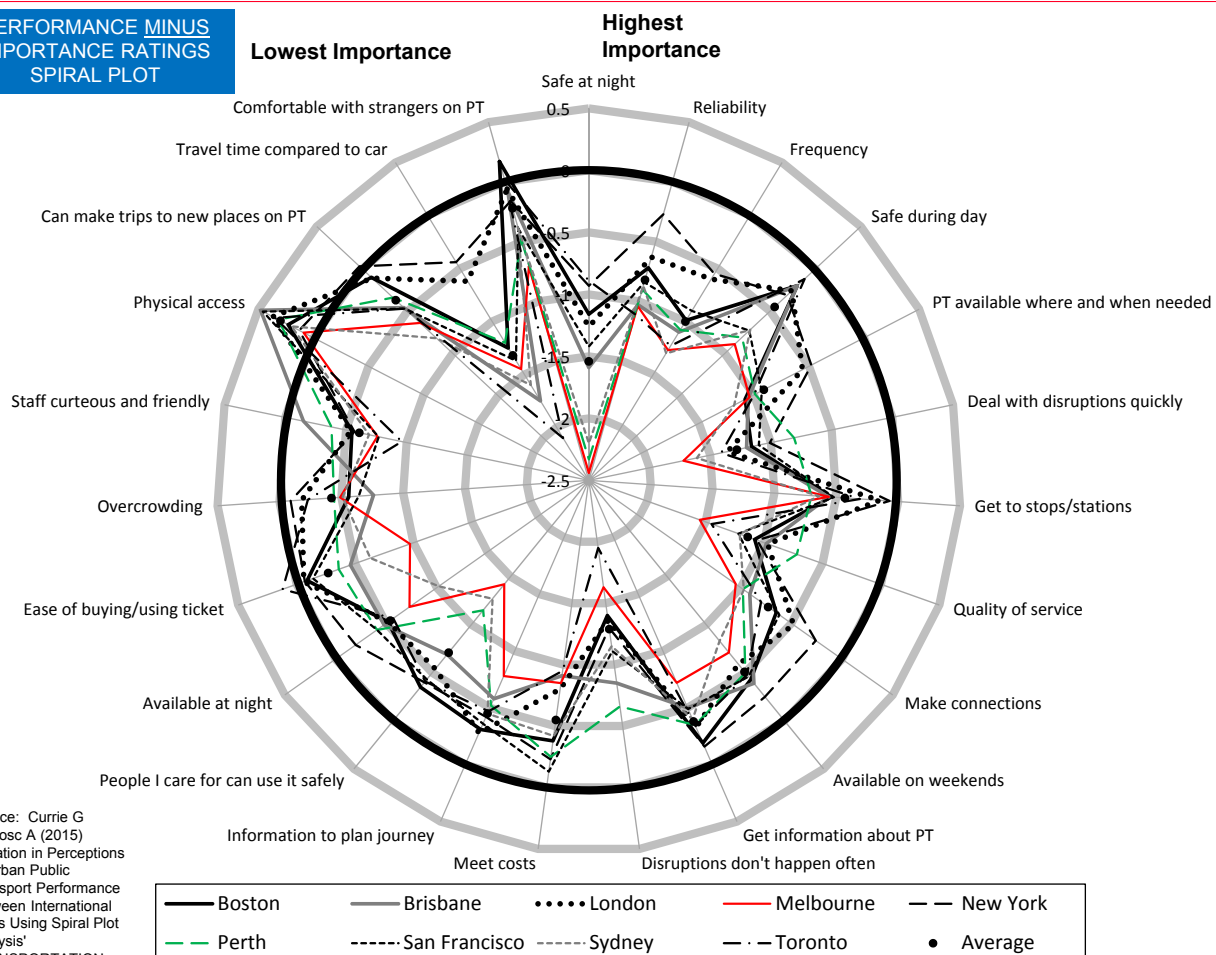


Source: Pan D (2013) 'Key Transport Statistics of World Cities' Journeys Sept 2013

So what do passengers think about these issues?



PERFORMANCE MINUS
IMPORTANCE RATINGS
SPIRAL PLOT



Bus Passenger Views of Improvements – Reliability, Coverage, Frequency

Bus Passenger Opinions on Bus Improvement Priorities

	Improvement Options	Individual Score	Average Score
Reliability	Buses arriving and departing on time	6.22	6.16
	Buses connecting well with other transport services	6.10	
Temporal Service Coverage	Weekend services provided	5.93	5.71
	Buses operating until late at night on weekends	5.49	
Frequency	Buses running more often in peak hours	5.23	5.23
Information	Improved bus service information at stops	5.27	4.90
	Customer information buttons at stops	4.52	
Safety	Safer pedestrian crossings at bus stops	4.85	4.64
	Lighting and video surveillance at bus stops	4.43	
Comfort	Improved shelter and seating at stops	5.06	4.55
	Making it easier to get on and off buses	4.04	
Speed/TT	Bus trips take less time	4.11	4.11
Spatial Service Coverage	Bus services operating closer to home	4.14	3.71
	Buses operating to new destinations	3.27	

Notes: Scores range from 1 to 7

Source: Smart Bus project. Passenger and local community research (YCHM, Nov. 1999)

How Transit Orientated is Melbourne Development – how does it related to buses?

Density

– the concentration and compactness of development within geographic space

Diversity

– the land use mix including the balance and compatibility of users with each other (and transit)

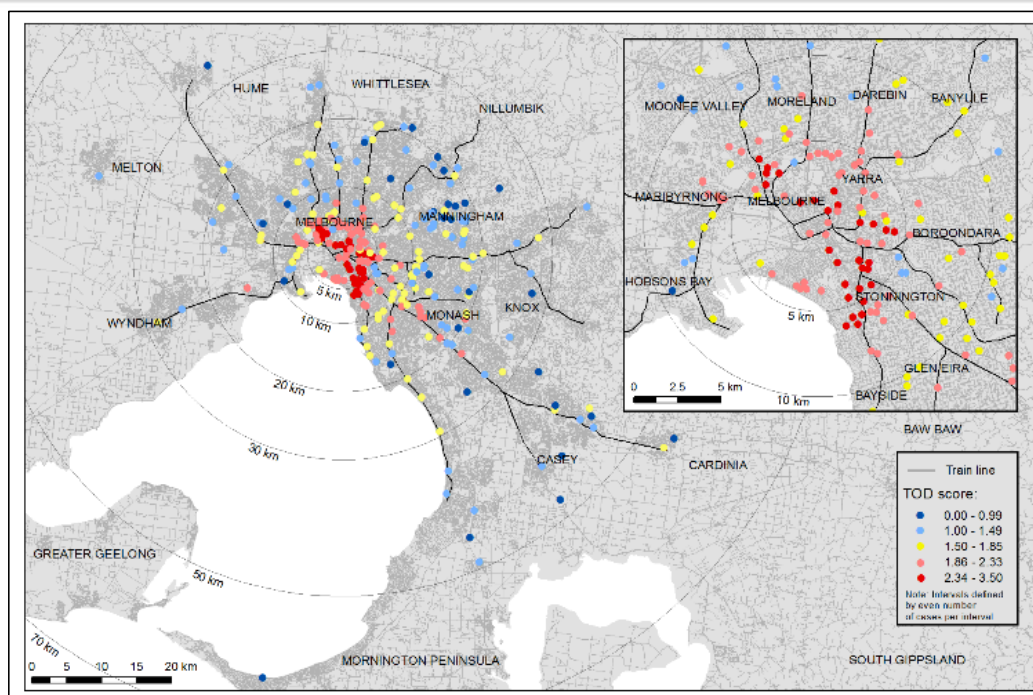
Design

– which relates how the various land uses are combined, linked and presented in terms of ease of access and attractiveness



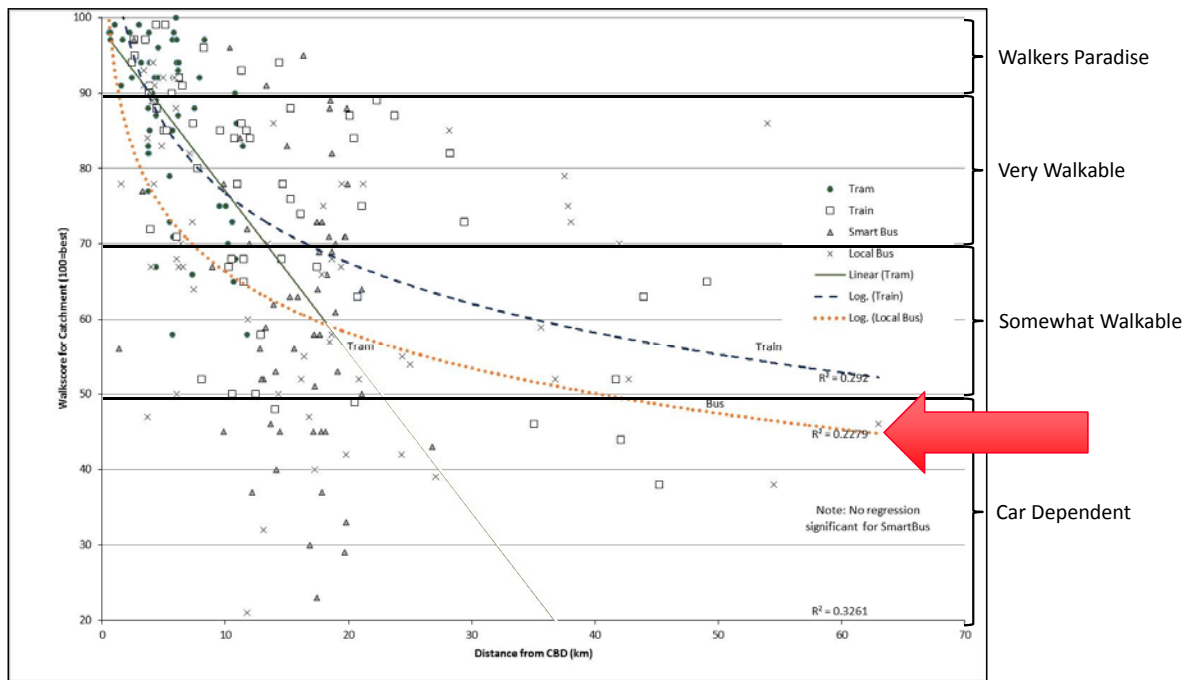
Source: Cervero and Kockleman (1997)

The Transit Orientation of Development – OVERALL Melbourne – only in central areas



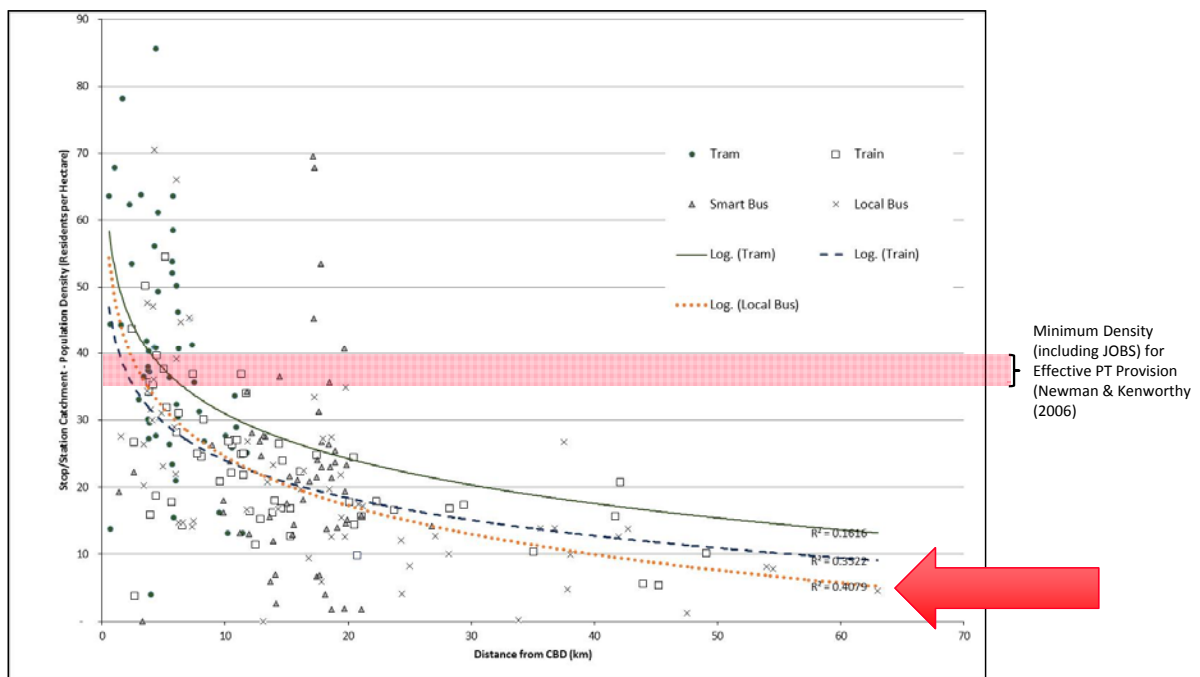
Source: Aston L, Currie G and K Pavkova (2016) 'Does Transit Mode Influence the Transit-Oriented of Urban Development? - An Empirical Study' JOURNAL OF TRANSPORT GEOGRAPHY Vol 55 (2016) pp83-91

Transit Oriented Development – Design (walkability) and buses



Source: Aston L, Currie G and K Pavkova (2016) 'Does Transit Mode Influence the Transit-Oriented Urban Development? - An Empirical Study' JOURNAL OF TRANSPORT GEOGRAPHY Vol 55 (2016) pp83-91

Transit Oriented Development – Density and Buses



Source: Aston L, Currie G and K Pavkova (2016) 'Does Transit Mode Influence the Transit-Oriented Urban Development? - An Empirical Study' JOURNAL OF TRANSPORT GEOGRAPHY Vol 55 (2016) pp83-91

Introduction

Transport Melbourne & Buses

Bus Ridership Growth

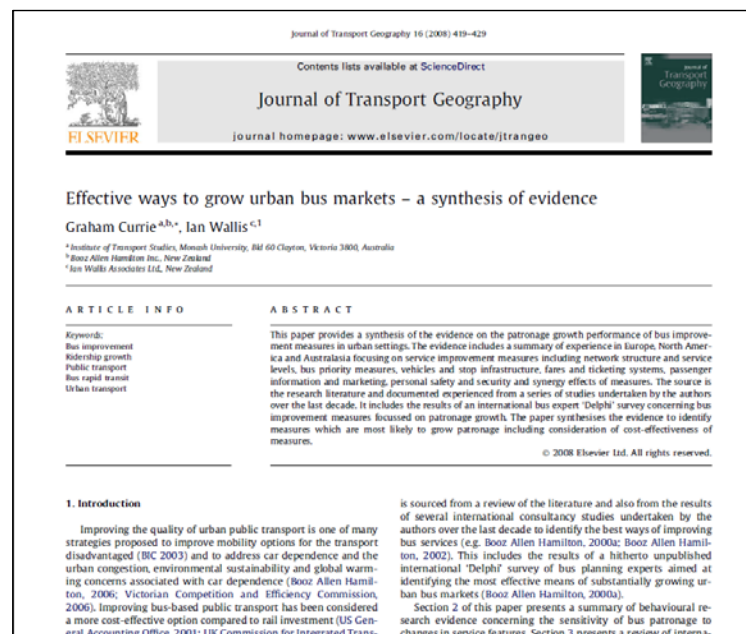
LGA Data



Bus Ridership Growth...we did a world review of methods of substantially increasing bus ridership - here are the findings

Issues Covered

- Behavioural studies (elasticity of demand)
- Bus Improvement Experience
- International Expert Delphi Study



Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

Behavioural evidence identifies a rank for improvement measures based on maximum possible impact

- Rank based on higher patronage growth impacts:
 1. Service Level Improvement (200% plus)
 2. Free fares ($\leq 40\%$)
 3. Reliability ($< 20\%$)
 4. Travel Time ($< 15\%$)
 5. BRT (alone) ($< 10\%$)
 6. Soft Factors ($< 2-5\%$)

Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

Bus improvement experience (Australia) suggests major BRT revisions, network restructuring and free CBD services (tram in Melbourne)

- Ranking of measures based on patronage impacts:
 1. Bus Rapid Transit Systems (market growth in the order of 20% - 70% at a corridor level)
 2. (Free) CBD Distributors (market growth around 50% - 200% affecting CBDs)
 3. Bus Network Area Restructuring (network-wide market growth around 10-30%)
 4. Express Bus (market growth around 15% - 30% but only affecting route catchments)
 5. Increased Frequencies/Minibus (market growth 10% - 40% at mainly a route level)
 6. Bus Priority Measures (10% - 50% at a route group/corridor level)
 7. Bus Marketing/Passenger Information, including TravelSmart (up to 20% at an area level).

Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

A UK study (TAS) identified network simplicity as THE most cost effective pax growth measure

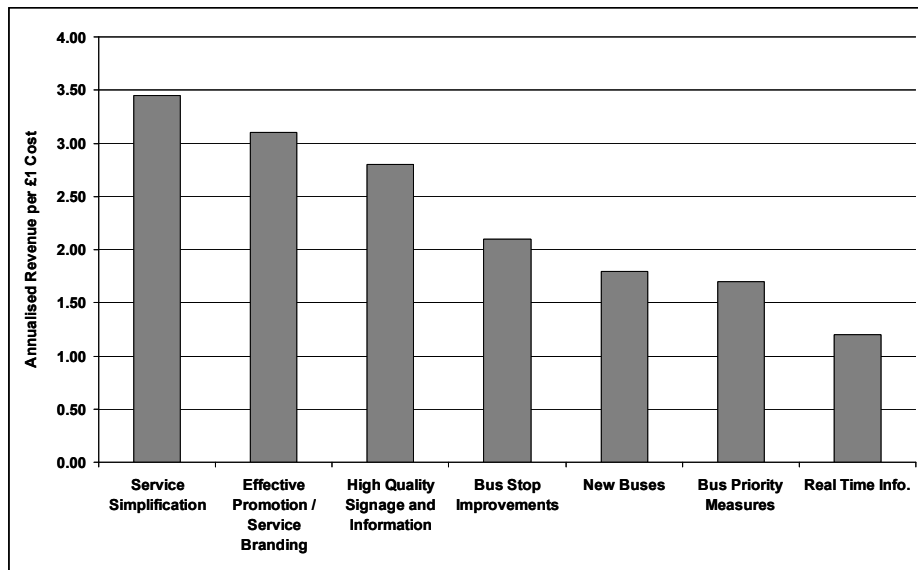


Figure 1 : Cost Effectiveness of Bus Improvements – UK
Source : (TAS Partnership ,2002)

Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

The EU Jupiter project identified priorities in terms of effectiveness and cost effectiveness

JUPITER Rank for Highest Patronage Impacts

1. Service reliability based measures (busways, bus lanes, junction priority)
2. Frequency of service
3. Passenger information based measures

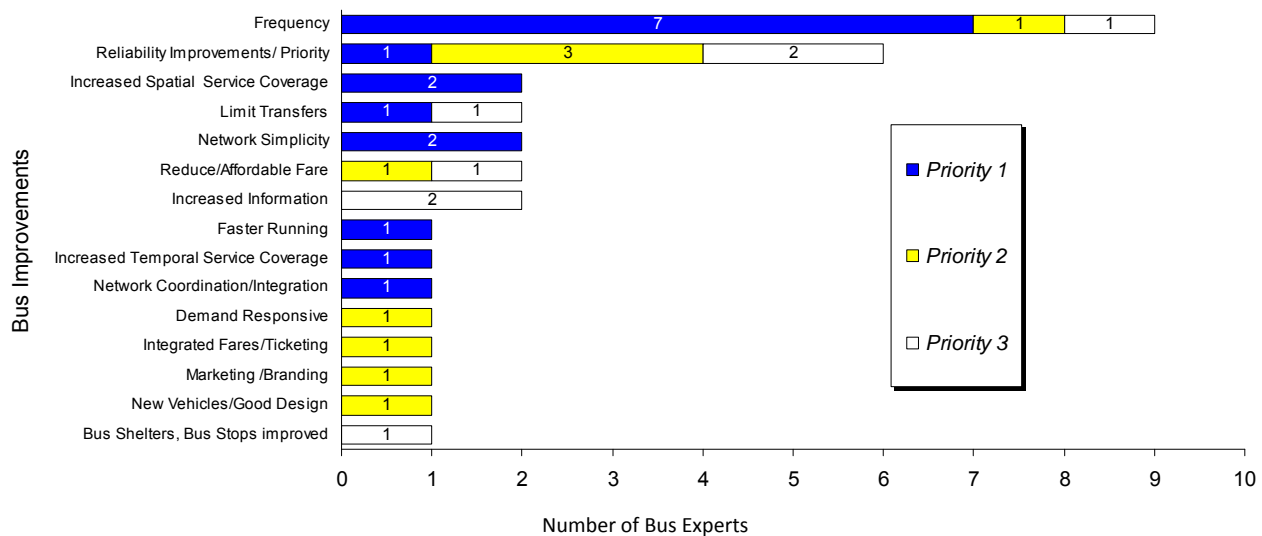
JUPITER Rank for Highest Cost Effective Patronage Impacts

1. Low floor buses
2. Bus priority at traffic signals
3. New interchanges replacing inadequate facilities; and
4. Real time passenger information.

Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

The Expert Survey identified Frequency, Priority and Spatial Coverage as measures most likely to grow bus markets

Factors Most Likely to Grow Bus Markets



Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

The research identified many commonalities between alternative avenues of investigation

Synthesis of Factors to Effectively Grow Bus Markets

Behavioral Evidence	International Expert Survey
<ol style="list-style-type: none"> 1. Service Level Improvement (200% plus at low service level) 2. Free fares (<=40%) 3. Reliability (<20%) (where reliability poor) 4. Travel Time (<15%) 5. Intrinsic BRT factors (<10%) 6. Soft Factors (<2 % - as a package <10%) 	<ol style="list-style-type: none"> 1. Service Level Increases (frequencies) 2. Bus reliability Factors (like BRT ROW) 3. Spatial coverage <p><u>Best Practice Systems</u></p> <p>BRT systems due to high service level, reliability/ ROW segregation, simple marketing image</p>
Bus Improvement Experience	Cost Effectiveness
<p>Australia/Elsewhere</p> <ul style="list-style-type: none"> • Bus Rapid Transit Systems • Increased Service Levels • Bus Priority • CBD Free Bus Systems 	<ol style="list-style-type: none"> 1. Service Simplification 2. Promotion/Branding 3. New Low Floor Buses 4. Bus traffic signal priority 5. Real time information systems

Source: Currie, G. and Wallis, I. (2008) , Effective ways to grow urban bus markets – a synthesis of evidence, JOURNAL OF TRANSPORT GEOGRAPHY 16 (2008) 419–429

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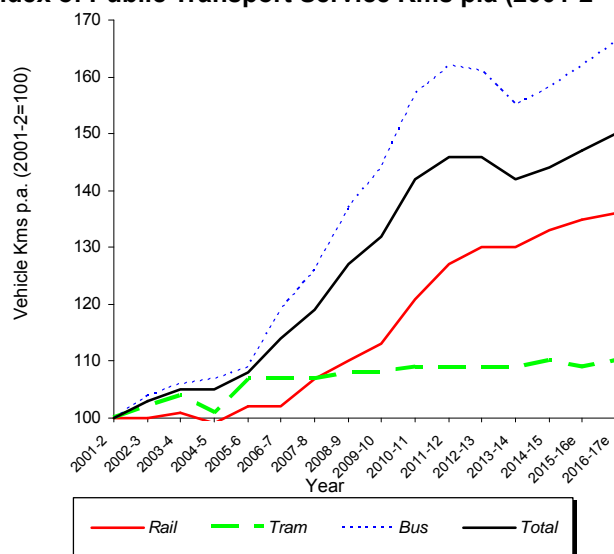
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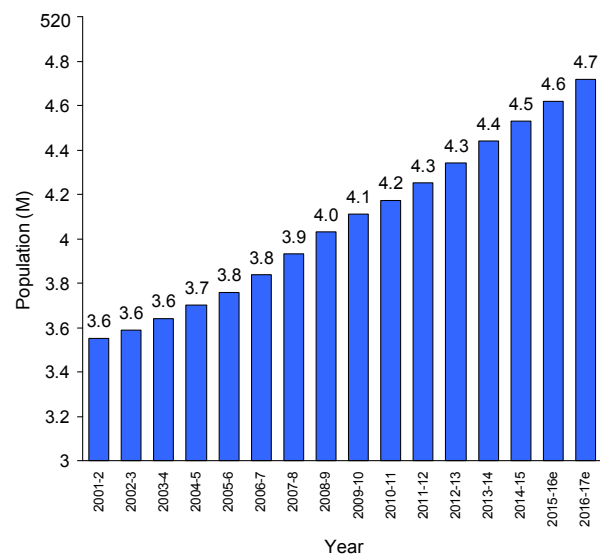


Since 2001 PT service increased 63% (66% bus/ 36% rail, 10% tram) but - but population growth continues at a faster pace...

Index of Public Transport Service Kms p.a (2001-2=100)

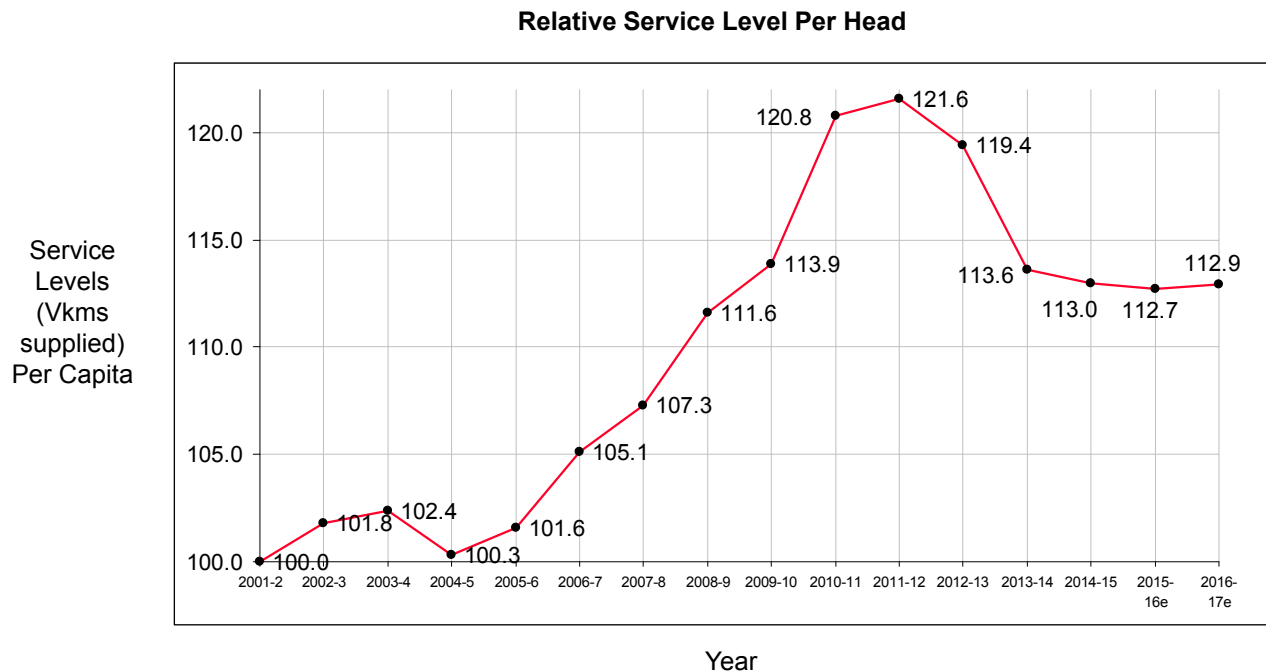


Population Growth (M)



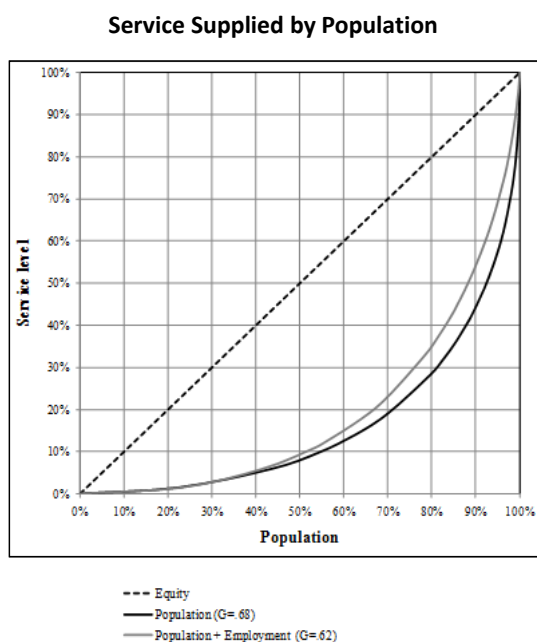
Source: Department of Transport/ Public Transport Victoria Annual Reports

...in last 10 years, per person service increased 22% then declined since 2011 (we have declined by 9% points); recent trend is flat

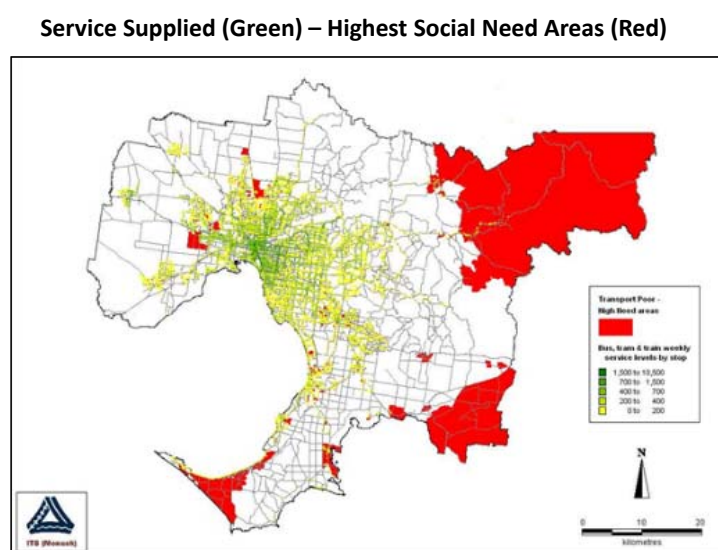


Source: Department of Transport/ Public Transport Victoria Annual Reports

Melbourne has BIG inequity in PT service– many high need areas with no service areas on the urban fringe; bus is a big part of this

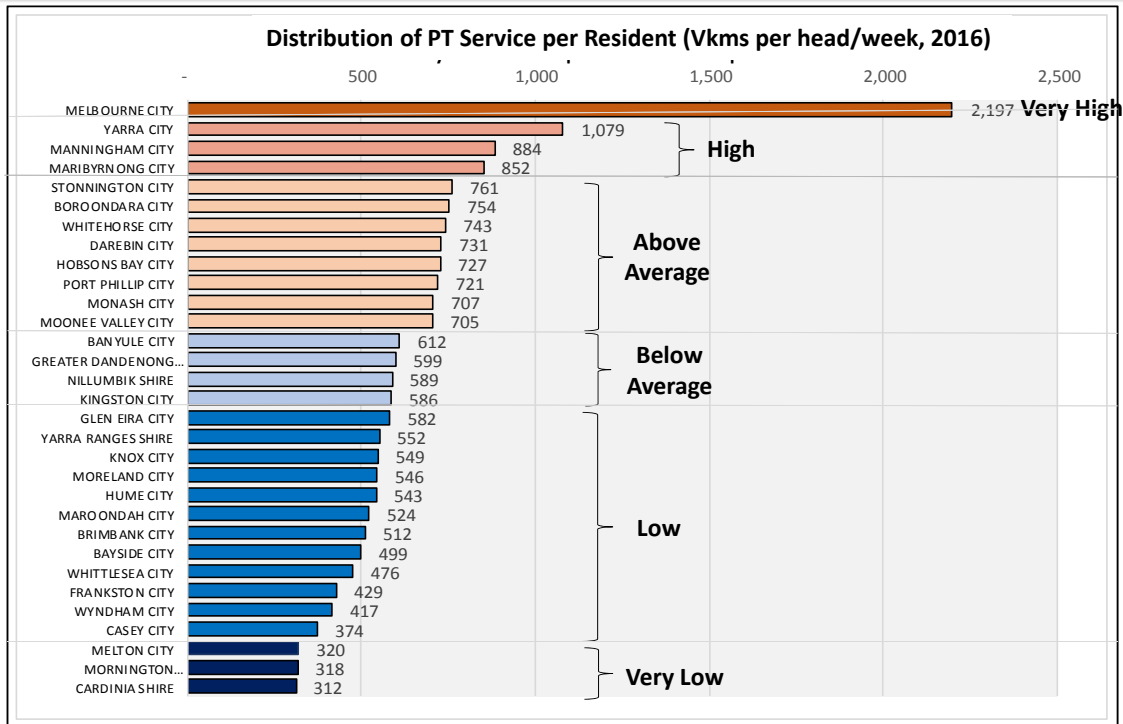


Source: Delbosc A and Currie, G. (2011) 'Using Lorenz Curves to Assess Public Transport Equity' JOURNAL OF TRANSPORT GEOGRAPHY Volume 19, Issue 6, November 2011, Pages 1252-1259



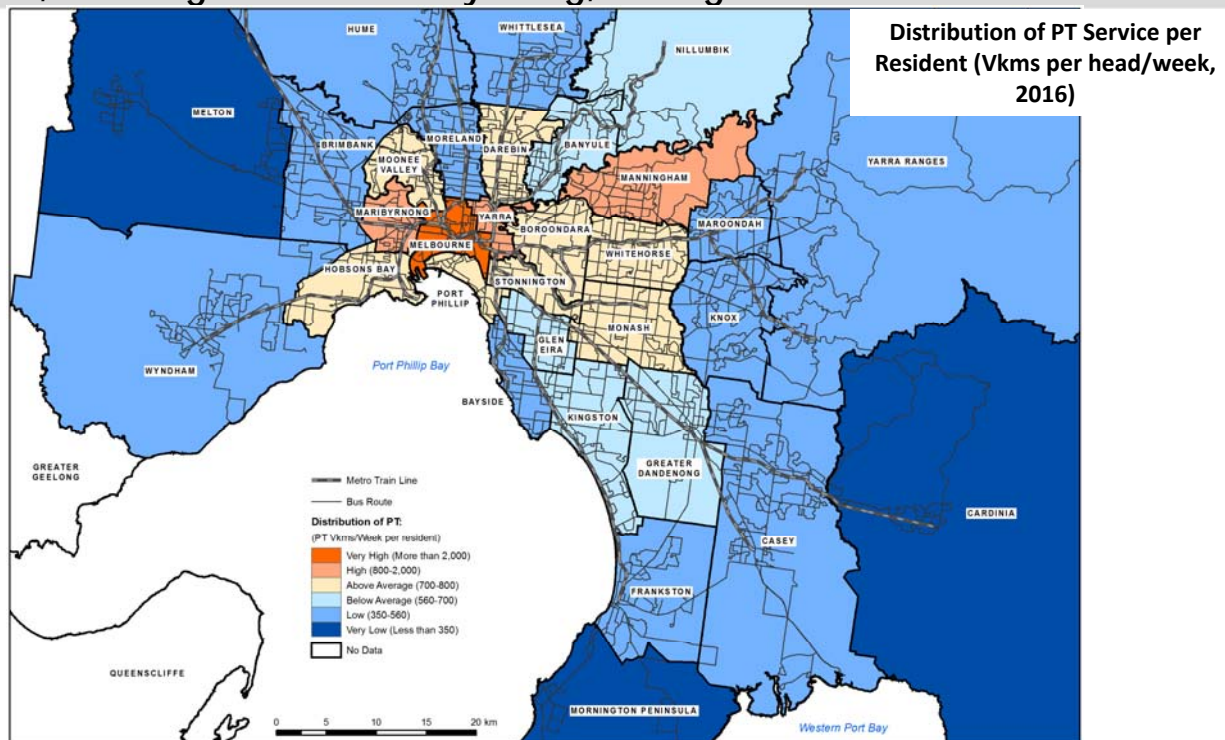
Source: Currie, G. (2010) Quantifying spatial gaps in public transport supply based on social needs, JOURNAL OF TRANSPORT GEOGRAPHY 18 (2010) 31–41

In 2016, 18 of our 30 LGA's have below average service per resident...



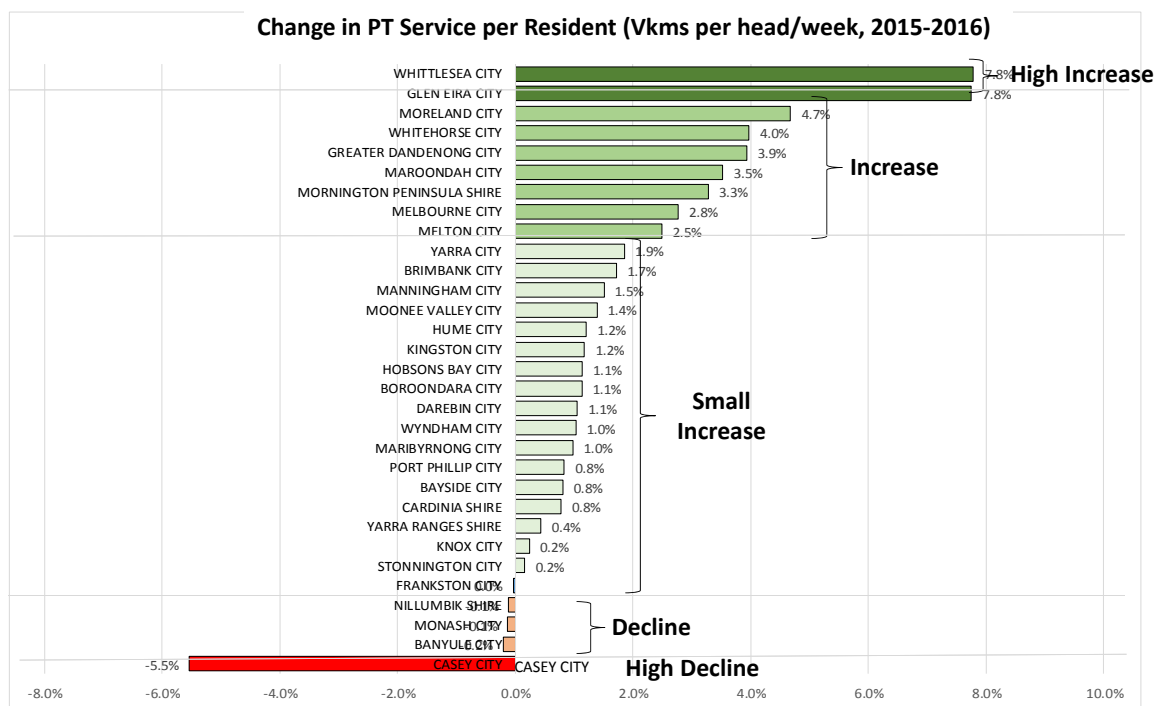
Source: PTRG analysis of the GTFS file data for Melbourne. Includes bus, rail and tram. Weekly data extracted for the week 19th- 25th Sept 2016. Data production undertaken by Phillip Boyles and Associates

Cardinia, Mornington & Melton have lowest service/head; Melbourne, Yarra, Manningham and Maribyrnong, the highest



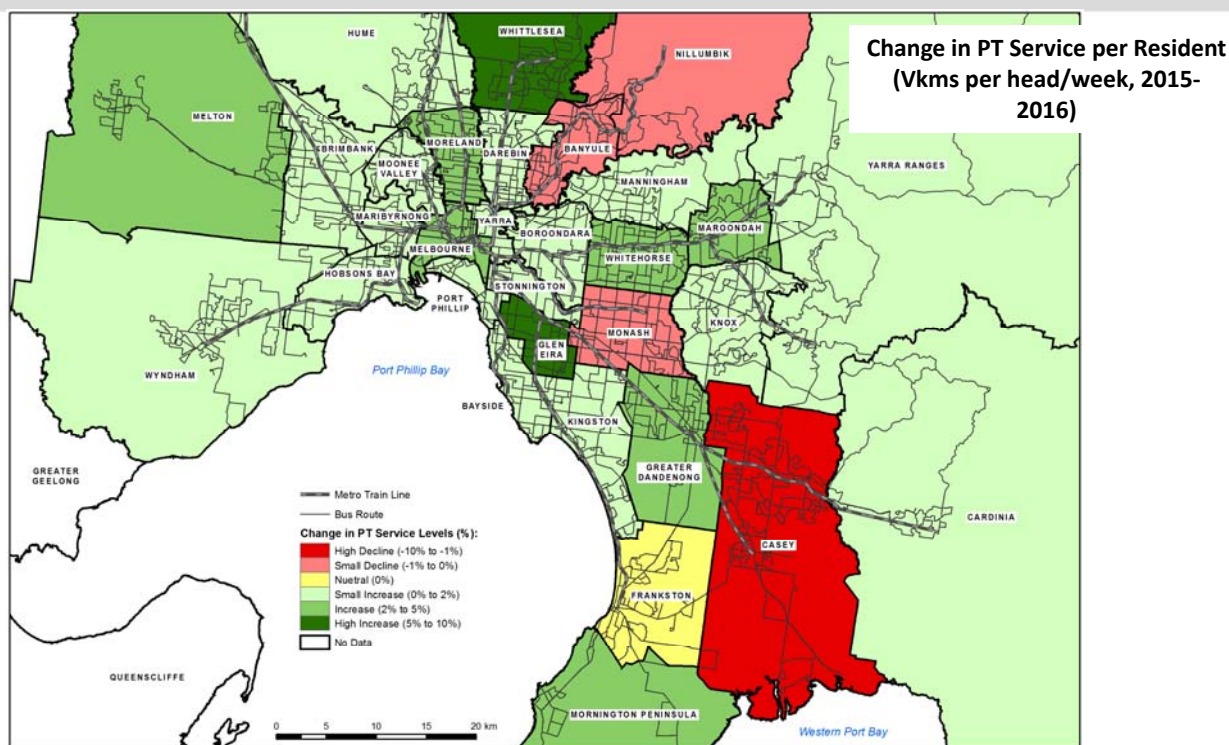
Source: PTRG analysis of the GTFS file data for Melbourne. Includes bus, rail and tram. Weekly data extracted for the week 19th- 25th Sept 2016. Data production undertaken by Phillip Boyles and Associates

Change in service is also uneven; some decline occurred 2015-2016...



Source: PTRG analysis of the GTFS file data for Melbourne. Includes bus, rail and tram. Weekly data extracted for the week 19th- 25th Sept 2016. Data production undertaken by Phillip Boyles and Associates

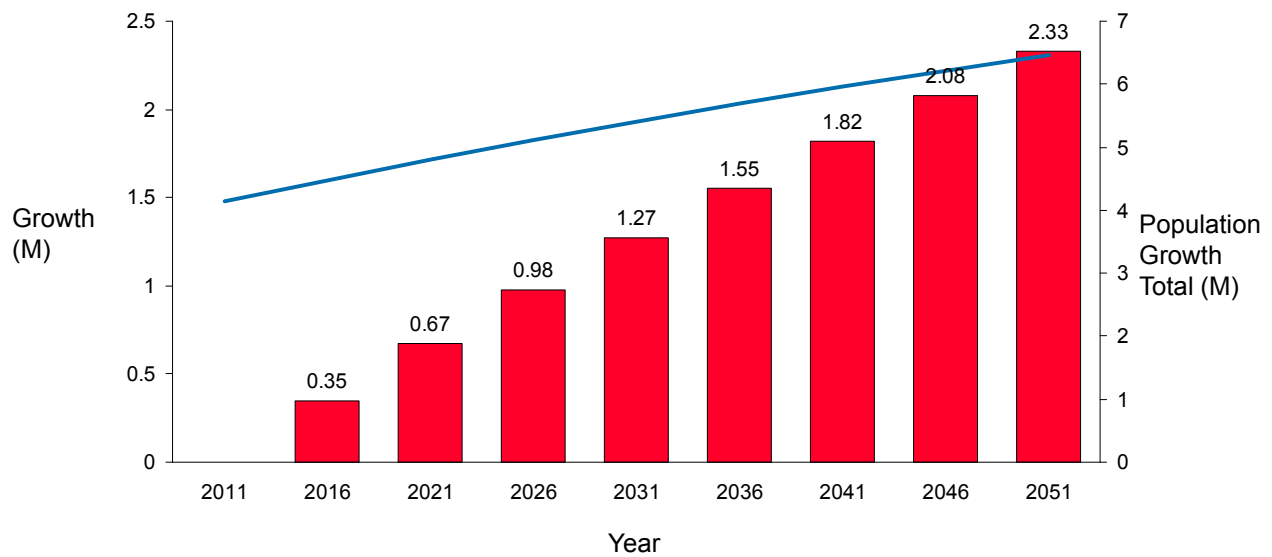
...Notably in Casey, Banyule, Nillumbik and Monash.



Source: PTRG analysis of the GTFS file data for Melbourne. Includes bus, rail and tram. Weekly data extracted for the week 19th- 25th Sept 2016. Data production undertaken by Phillip Boyles and Associates

Melbourne is expected to increase in size by another 1-2M people in 20-30 years

Forecast Melbourne Population Growth



Source: Victoria in Future (2012)

CONNECTING CITIES

PTRG is the name for researchers at Monash University who are engaged in research on public transport systems, users, planning and policy.

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24 PHD RESEARCHERS
48 MASTERS STUDENTS
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PTRG OVERVIEW
The Public Transport Research Group is the name for researchers at Monash University who are engaged in research on public transport systems, users, planning and policy. Research interests of the group are cross disciplinary, covering a range of topics in the public transport field.

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Find out more about our staff, national associates, international associates, research students, PhD students and our advisory board who are all associated with the Public Transport Research Group.

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PUBLIC TRANSPORT SERVICE LEVEL TRENDS IN LOCAL GOVERNMENT AREAS IN MELBOURNE

Objectives

- To measure the quantity of urban public transport provision in local government areas in Melbourne between 2015 and 2016
- To explore if and how urban public transport provision has kept pace with population growth.

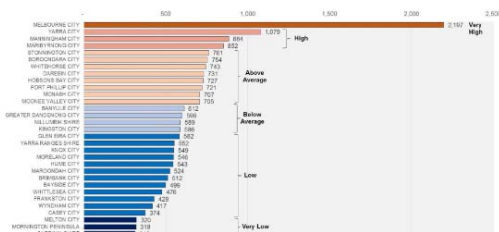
Method

- Compilation of public transport vehicle kilometres and urban population data for local government areas in Melbourne by year
- Comparison of public transport vehicle kilometres per capita by year.

Key results

CHANGES IN PUBLIC TRANSPORT SERVICE LEVELS PER CAPITA ARE HIGHLY UNEVEN ACROSS MELBOURNE.

Fig. 1 Public transport service provision per capita by local government area in Melbourne, 2016
(Total weekly public transport vehicle kilometres per 1,000 people)



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Objectives

- To measure aggregate urban public transport provision in Melbourne from 2001-02 to 2016-17
- To explore if and how urban public transport provision has kept pace with population growth.

Method

- Compilation of public transport vehicle kilometres (by mode) and urban population data for Melbourne by year
- Comparison of public transport vehicle kilometres per capita by year.

Key results

PUBLIC TRANSPORT SERVICE PROVISION PER CAPITA HAS BEEN DECLINING SINCE 2011-12 IN MELBOURNE.

Fig. 1 Public transport timetabled kilometres per year by mode in Melbourne (indexed: 2001-02 = 100)

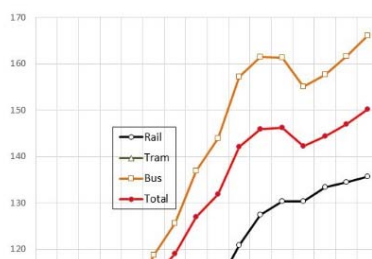
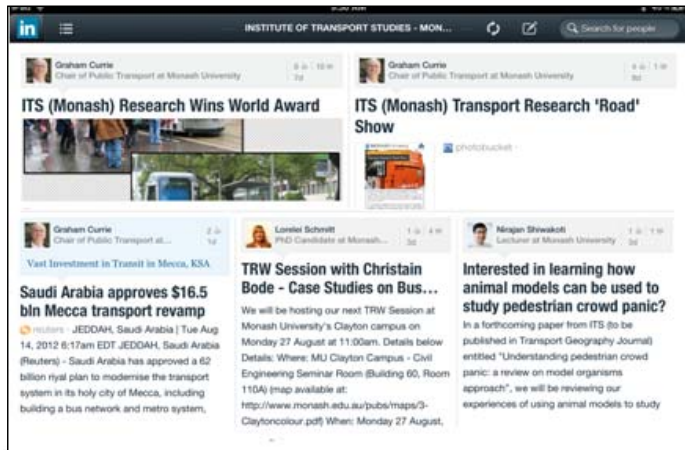


Fig. 2 Public transport timetabled kilometres per capita per year in Melbourne



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391
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40

QUIZ

Which of the following are:

A.= Train/Tram

B.= Bus

C.= Dont Know

D.= Other

A.



B.



C.



D.



E.



F.



G.



H.



I.



J.



QUIZ

Which of the following are:

A.= Train/Tram

B.= Bus

C.= Dont Know

D.= Other

B.= Bus
A.



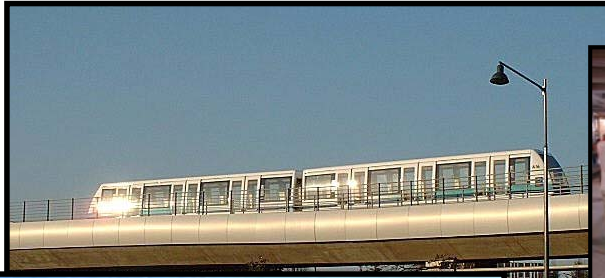
The Zip – US BRT Vehicle

B.= Bus
B.



Civis –BRT Vehicle

B.= Bus (?)



Paris Metro RER Rollingstock –
VAL - Toulouse Metro

B.= Bus



TransMilenio BRT
Bogota Colombia

B.= Bus

L.



Civis –BRT Vehicle

B.= Bus

T.



Bombardier – Concept BRT Vehicle

A.= Tram



Bordeaux Tram – Ground Power

D.= Other



Japanese rail firm JR Hokkaido dual-mode bus and rail vehicle

A.= Train

I.



US Railbus Leyland body on a chassis assembled by D. Wickham & Co for the US Federal Railroad Administration

B.= Bus

J.



The trolleybus (variously known as 'trolley-coach', 'tbus', 'electroliner', 'street car', or 'trackless tram')