

**Title Page**

# **Changes in Travel Demand in Melbourne – is it time for a new paradigm?**

INITIAL SUBMISSION

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## **Abstract**

Before 2004, travel behaviour and public transport patronage growth in Melbourne were predictable. Trip rates and mode shares were constant, and demand changes were closely linked to population growth. Since 2004, however, there has been a dramatic increase in patronage on sustainable modes of travel, most evident in the surge in public transport patronage.

Understanding the reasons for such growth and how these trends in mode choice might be reflected in the future is critical in forecasting future patronage levels. Metlink and DOT have undertaken significant research to attempt to answer these questions, both before and during the Global Financial Crisis and in all Australian mainland state capital cities.

This research reveals a number of key drivers, most notably a potential new market segment that has emerged that is driven by lifestyle choices around the environment and health & fitness issues, that makes them heavily pre-disposed to public transport and other sustainable transport modes. Other factors have also clearly been a key part of the story, and themselves are difficult to forecast future trends. The early conclusion from this research is that it might be time to proclaim a new paradigm of travel choices in Melbourne which has significant implications for future patronage forecasting.

## Changes in Travel Demand in Melbourne - is it time for a new paradigm?

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### 1. INTRODUCTION

Between 1980 and 2004, demand for public transport in Melbourne was relatively predictable. Public transport patronage growth was closely linked to population growth. There was an average patronage growth rate of 1.5% per annum on the metropolitan train network across these 25 years (DOT, 2009), slightly above the average population growth for the same period (ABS, 2004). Although accurate measures of mode share are not available for this entire period, it can be assumed that there were no dramatic shifts in public transport's share of motorised trips. In short, predicting public transport demand was a relatively straight-forward task.

In 2004, this picture of public transport demand in Melbourne changed suddenly, dramatically and unexpectedly. Between 2004 and early 2009, Melbourne experienced unprecedented levels of growth in public transport usage, particularly on the metropolitan train network (DOT, 2009). At the same time, a cycling "boom" has also been reported in Melbourne (Moynihan, 2006) and there was a 6.3% increase in walking as a method of travelling to work between 2001 and 2006 (DOT, 2008). This represents a significant break from past trends and a significant shift towards these 'sustainable' transport modes.

These increases in public transport and cycling can either be explained by increased overall trip rates, or as a shift from another mode. Research undertaken within the Department of Transport (DOT), Victoria strongly suggests a steady or slightly declining overall trip rate in the past decade (VISTA 2007). Thus, it is suggested that the increases in public transport and cycling patronage are the result of a shift from private vehicle travel to sustainable transport modes. As private vehicle travel is by far the predominant mode of transport in Melbourne, a small but significant shift away from car usage can have a dramatic impact on modes with a small base, such as public transport and cycling. The significant changes seen in Melbourne are thus viewed in this paper as part of a shift in overall transport mode preference.

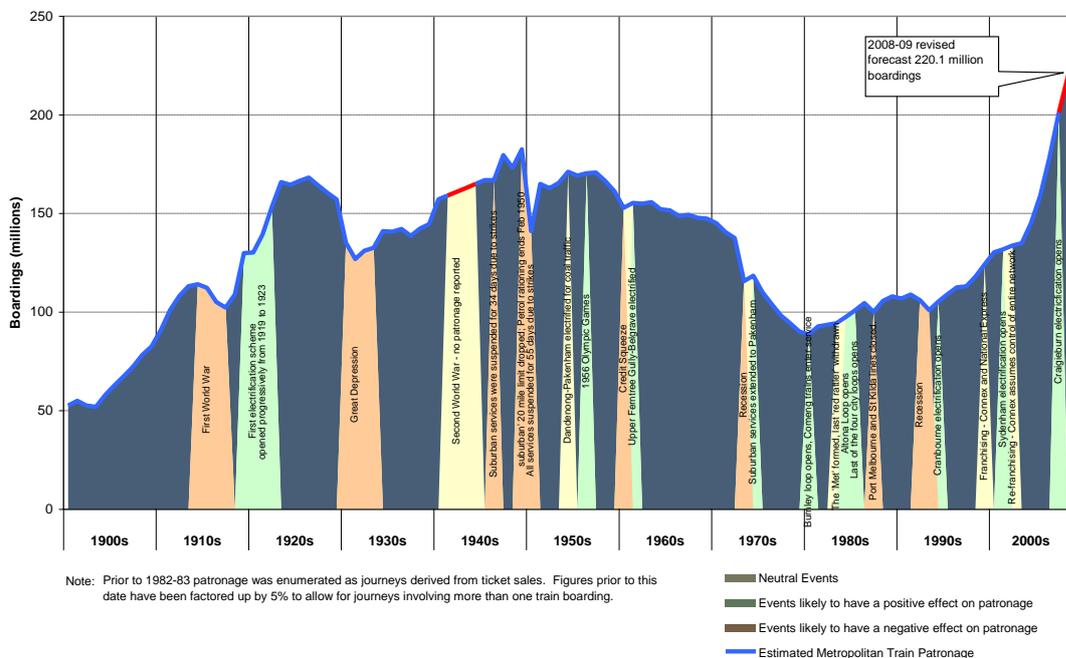
Forecasting future public transport patronage, therefore, becomes much more of a challenge. Public transport patronage forecasts within DOT are typically made using large transport network models, such as DOT's own Melbourne Integrated Transport Model (MITM). None of the transport network models being run at the beginning of this decade predicted such a surge in public transport patronage. Although many of the key factors driving the change in transport demand are well-known, it has not even been easy to explain these patronage changes *post hoc*. Even though transport network models are designed to predict long-term trends, and may not accurately predict shorter-term fluctuations based on changes to the strength of the economy, public transport patronage would have to be zero until 2015/16 for MITM's long-term forecasts to be accurate. This makes future patronage forecasting using traditional models problematic (at best).

This paper explores some of the research that has been undertaken to attempt to explain the strong increase in public transport patronage and related softening in demand for some private vehicle travel evident between 2004 and 2009, and a particular eye on forecasting future demand. There is no attempt made in this paper to undertake a comprehensive review of the academic literature relating to sudden transport demand changes, but rather, the focus is on the specific market research undertaken in the Melbourne-context. The perspective provided is unapologetically one from the practitioner’s viewpoint, and as such, raises as many questions about the challenges we face as it answers. The paper also focuses on macro factors thought to be affecting travel demand, and does not cover some of the more micro (but still important) changes in demographic and social trends, such as car ownership levels and how people are deciding where to live and work, that may be influencing transport demand patterns.

The paper considers the possibility that we are at the beginning of a new era or paradigm of consumer decision-making in regards to transport mode choice in Melbourne. This is considered in terms of a potential new market segment, often referred to by the marketing term LOHAS (Lifestyles of Health And Sustainability). The paper concludes with an outline of the considerable challenges associated with generating accurate transport demand forecasts for the future.

## 2. TRAVEL DEMAND CHANGES EVIDENT SINCE 2004

Metropolitan rail patronage in Melbourne since 1900 has seen a number of distinct phases of growth, plateaus and declines (see figure 1). Many of these are related to broad social and economic trends, such as the introduction of the motor car and increased levels of disposable income.



**FIGURE 1: Melbourne’s Metropolitan Train Patronage – 1900-2009**

The period from the mid 1950s until 1980 was characterised by a significant decline in train patronage as annual boardings fell from 170 million to less than 100 million. The following period from 1980 to 2004 was characterised by slow and steady growth as patronage grew from around 90 million to 135 million annual boardings, interrupted by a few years of

decline coinciding with the economic downturn (and dramatic cuts to the public sector) in the early 1990s.

In contrast, the period from 2004-2009 represents a sharp and significant break from the 1980-2004 trend. The growth rates for train patronage during 2004-2009 period reached double-digit levels. The growth rates for tram, metropolitan bus and regional train were also higher than historical averages. Table 1 outlines the changes in patronage and annual growth rates by mode since 2001/02.

The public transport story since 2004 has been a clear one of significantly increased patronage across all modes. DOT has undertaken two major travel survey projects in the past fifteen years to look at travel trends across other modes of travel. The Victorian Activity and Travel Survey (VATS) was run during the 1990s and provided an accurate estimate of mode share for 1994-1999. More recently, a travel survey has been re-launched by DOT as the Victorian Integrated Survey of Travel and Activity (VISTA), which was run for the first time in 2007/08. These large sample surveys allow us to compare travel behaviour before and after the surge in public transport patronage (VISTA, 2007).

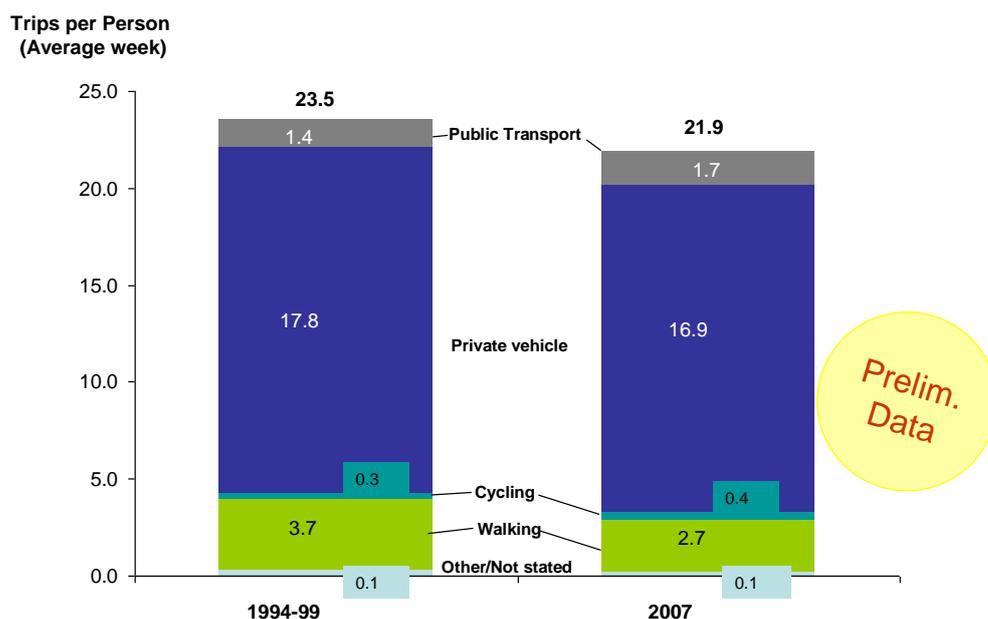
**TABLE 1. Melbourne Public Transport Annual patronage and growth rates  
– 2001/02 to March 2009**

Financial Year	Metropolitan Train		Tram		Metropolitan Bus		Regional Train	
	Boardings (millions)	Annual growth (%)						
2001/02	131.8	1.2%	131.9	1.9%	92.0	0.0%	7.7	-2.4%
2002/03	133.8	1.5%	134.7	2.1%	93.9	2.1%	7.4	-3.4%
2003/04	134.9	0.8%	135.9	0.9%	93.6	-0.3%	6.9	-8.2%
2004/05	145.1	4.0%	145.3	2.0%	90.0*	Stable*	6.4	-7.1%
2005/06	159.1	9.7%	149.6	2.9%	79.1*	Stable*	6.6	3.4%
2006/07	178.6	12.2%	154.9	3.6%	85.0	7.4%	8.8	34.2%
2007/08	201.2	12.7%	158.3	2.2%	913	7.4%	11.0	24.4%
2008/09 (12 months to end of March 09)	213.6	10.9%	178.4	15.2%	100.2	14.6%	12.0	14.8%

\* change in methodology – focus on growth percentages for bus in this period

Source: Department of Transport, Official Patronage Series, March 2009

As can be seen in figure 2, between the 1990s and 2007, the average weekly number of trips taken per person dropped in Melbourne from 23.5 to 21.9 weekly trips. This was driven by reductions in private vehicle and walking trips, but was countered by increases in public transport and cycling (from small bases). Public transport per capita weekly trip rates increased from 1.4 to 1.7. An increase of 0.3 trips per person per week by public transport might not seem like much of a change, but it represents a 21% increase. Most of this increase is hypothesised to have taken place between 2004 and 2007 (in line with recorded patronage growth), and has seemingly continued since the VISTA survey was completed.

**FIGURE 2: Melbourne – 1990s and 2007 average number of trips per person per week by mode**

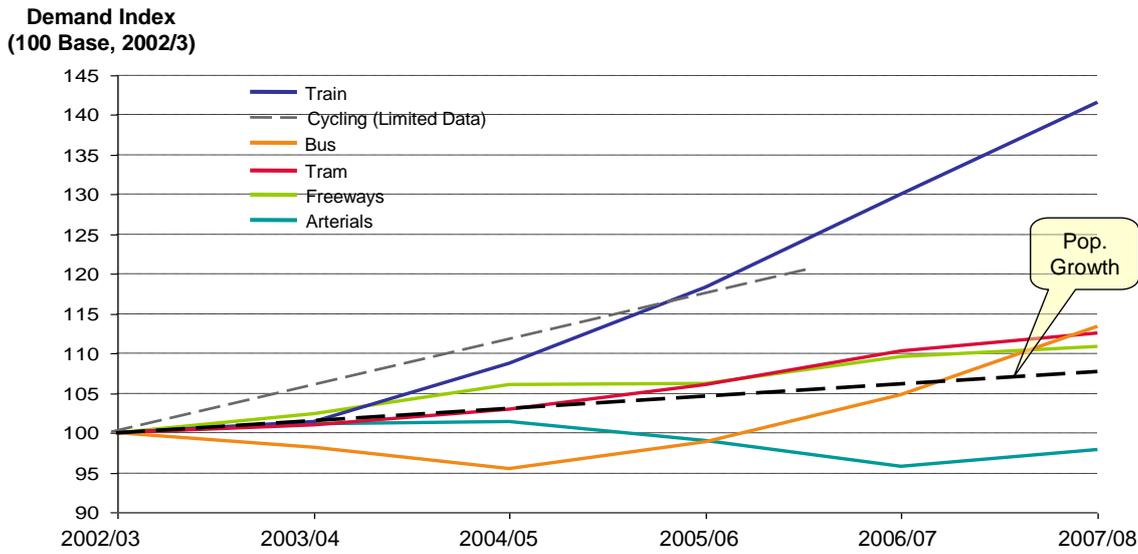
Source: Victorian Activity and Travel Survey 97 to 99 (VATS 97-99)  
Victorian Integrated Survey of Travel and Activity 2007 (VISTA 07): Version 1.1

Figure 2 highlights the situation whereby a small shift in demand from a mode with a very large base (private vehicles) to one with a relatively small base (public transport) can lead to large percentage increases in demand for the mode with the small base. This data also suggests that a 5% reduction in private vehicle per capita trip rates can explain the surge in demand for public transport. The logical follow-on question is whether this shift away from private vehicle travel is large enough for it to be seen as reduced traffic on the road system.

It is important to consider as well what type of trips are experiencing the mode shift from private vehicle to other modes of transport. In terms of infrastructure planning, the most important trips to consider are those taking place at the most congested time and location across the whole network. As such, infrastructure planners have introduced the notion of “core trips”, meaning those trips that are taking place at the most important times and locations in terms of capacity of the network. In Melbourne, core trips may be defined as taking place between 7am and 9am and occurring at least in part within 5 km of the Central Business District (CBD). VATS (1994-99) data suggests that although public transport’s share of all motorised trips was only 9% in the 1990s, the public transport share of AM peak motorised “core trips” was 37.3% and the share of all AM Peak “core” trips held by public transport, walking and cycling was 57.4% (SKM, 2008). VISTA (2007) data has not yet been analysed to allow for an assessment of how mode shift in “core” trips has been expressed in Melbourne, but this data will be available later in the year.

To answer the broader question of whether the increases in public transport patronage have been sufficient to see a reduction in demand for other modes, DOT (2009) put together a comparative analysis of relative demand for different modes since 2002/03 broken down by inner and outer suburbs. Figure 3 shows the relative demand for each major mode of transportation in the inner twelve Melbourne Local Government Authorities (LGAs) since 2002/03. It shows that demand for train has been substantial, demand for bus, tram and freeways has been slightly higher than population growth, but demand for travel on inner

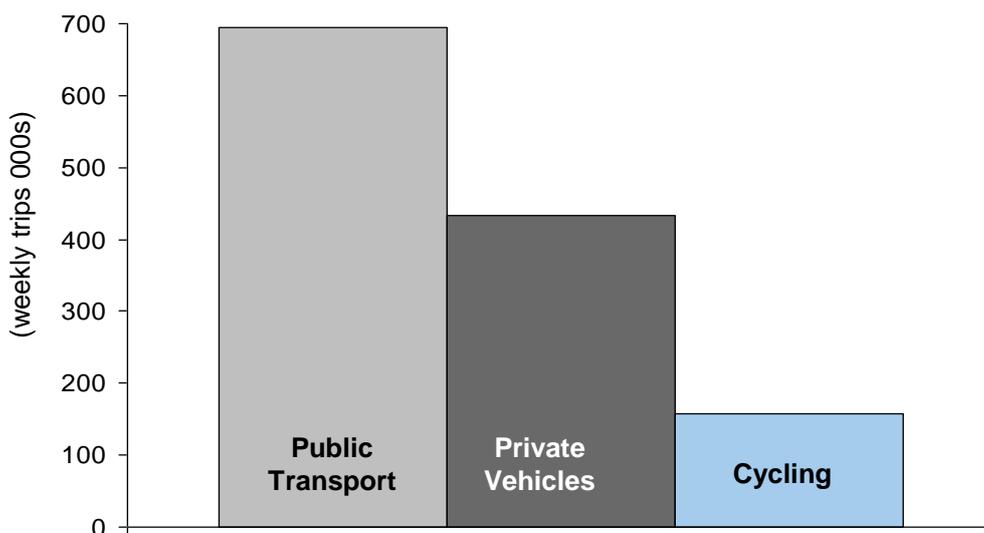
arterial roads has declined over this period. This suggests the shift in inner Melbourne has been focused on shifts from arterial roads to public transport.



Sources: Vicroads - data prepared for 07/08 Traffic Monitor (unpublished); Automatic Ticketing System (ATS); Datastore Cube; Metlink Original Destination (OD) Survey; Bus Association of Victoria; Transport Demand Information Atlas for Victoria Volume 1: Melbourne

**FIGURE 3: Inner Melbourne – Relative Weekday Growth Rates by Mode where 2002/03 demand = 100 - 2002/3 to 2007/8**

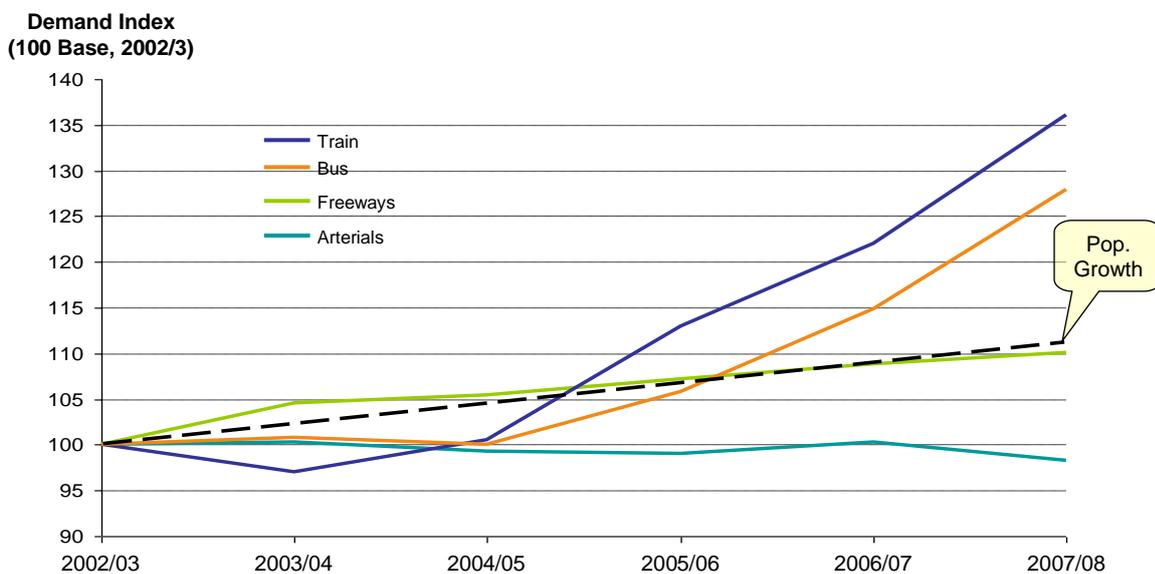
Figure 3 is highlighting the changes in demand since 2002/03, but does not refer to the size of each mode task, or absolute trip numbers, in its analysis. Figure 4 shows the estimated increase in trips taken on the inner Melbourne network between the 1990s and 2007. Even in absolute trip numbers, in inner Melbourne, public transport is having to absorb more new trips than the road network.



**FIGURE 4: Inner Melbourne – Estimated Net Growth in Trips by Mode - 1994-99 to 2007 (VATS 1994-99; VISTA, 2007)**

The picture in outer Melbourne (the remaining nineteen Melbourne LGAs) is somewhat similar, as depicted in figure 4. Train and bus growth have been substantial, freeway growth has followed population growth closely, and arterial demand has fallen, tracking well below population growth.

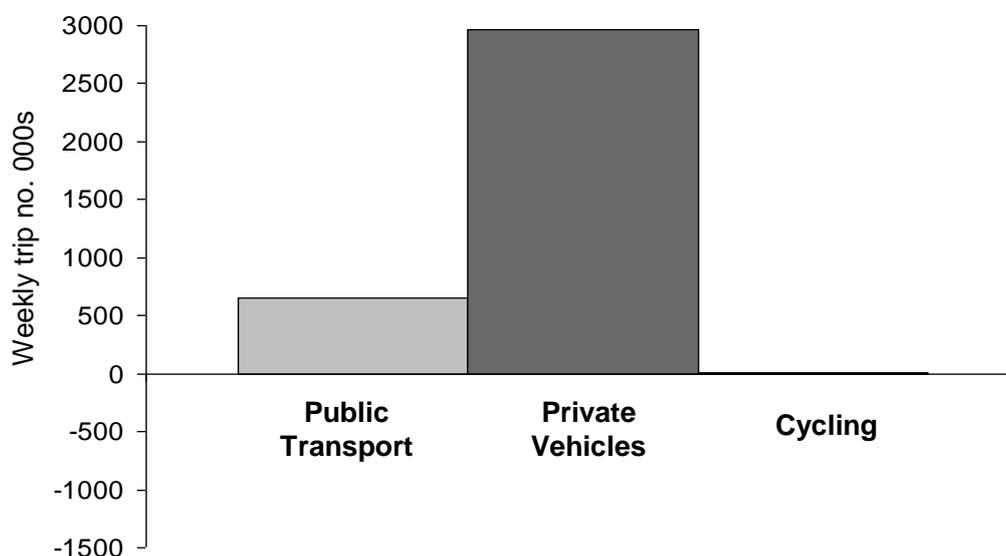
Overall, the period since 2004 has been characterised by a small but significant shift away from private vehicle travel towards public transport (and most likely cycling) as modes of transport, with a reduced trip rate overall also evident. Many key questions remain. The next section of this paper asks: Have the changes in Melbourne been any different to the rest of Australia? Further sections consider the reasons for the changes, the potential impact of the Global Financial Crisis (GFC), and the key question for forecasting transport demand: is this just a temporary ‘blip’ in overall demand, or a fundamental and long-term paradigm shift in transport mode choice?



Sources: Vicroads - data prepared for 07/08 Traffic Monitor (unpublished); Automatic Ticketing System (ATS); Datastore Cube; Metlink Original Destination (OD) Survey; Bus Association of Victoria; Transport Demand Information Atlas for Victoria Volume 1: Melbourne

**FIGURE 5: Outer Melbourne – Relative Weekday Growth Rates by Mode where 2002/03 demand = 100 - 2002/3 to 2007/8**

However, in terms of absolute trip numbers, due to the very small base for public transport in these areas, more of the additional trips added to the network have still been private vehicle trips (see Figure 6).



**FIGURE 6: Outer Melbourne – Estimated Net Growth in Trips by Mode - 1994-99 to 2007 (VATS 1994-99; VISTA, 2007)**

### 3. CHANGES IN DEMAND IN THE REST OF AUSTRALIA

The changes in travel demand since 2004 in Melbourne and, in particular, the increases in public transport patronage, have been dramatic. An initial picture of other mainland Australian capital cities suggests that these trends may have been stronger in Melbourne than elsewhere.

Market research undertaken by DOT and Metlink in September 2008 compared some of the behavioural changes and attitudes evident in Melbourne across all mainland state capital cities (including Canberra) by sampling 800 respondents in Melbourne and 300 in each other Australian mainland capital (Metlink, 2008). The results suggested that Melbourne had similar levels of reduced net private vehicle usage to the other cities (with the exception of Adelaide which had very little net reduced usage), but that Melburnian respondents were:

- More likely to cite ‘petrol prices’ as a key driver of the change;
- More likely (with Canberrans) to cite ‘environmental concerns’ as a key driver of the change; and
- More likely (again, with Canberrans) to:
  - believe that their changed behaviour was permanent;
  - believe that more money was required for public transport infrastructure;
  - factor in environmental concerns before making a transport mode choice; and
  - believe that in the future they might move away from their car as their main mode of transport.

In short, people living in Melbourne and Canberra were the most likely of all city-dwelling Australians to be pre-disposed to sustainable transport messages, and just as likely or more likely to be responding to these messages through a reduction in car usage. Recent patronage growth on public transport in Melbourne has also been stronger than in any other capital city, with only Brisbane experiencing similarly strong growth. It is hypothesised therefore that the Melbourne market may therefore differ in some fundamentally important ways from those in other capital cities of Australia.

#### 4. KEY FACTORS DRIVING THE CHANGES IN DEMAND

Interpreting the different trends evident in Melbourne compared with other cities is difficult until we have a detailed understanding of what has caused this shift in consumer behaviour with such dramatic consequences for public transport. There are several known drivers of increased public transport usage other than population growth. Most of these drivers involve a tendency for travellers to shift modes from private vehicle to public transport. In the period 2004-2009, several of these went in a very short space of time from low to high in their impact on mode shift, creating a ‘perfect storm’ of factors driving patronage. These are summarised in table 2.

**TABLE 2. Drivers of Public Transport Patronage Growth – Potential Factors in Melbourne 2004-09**

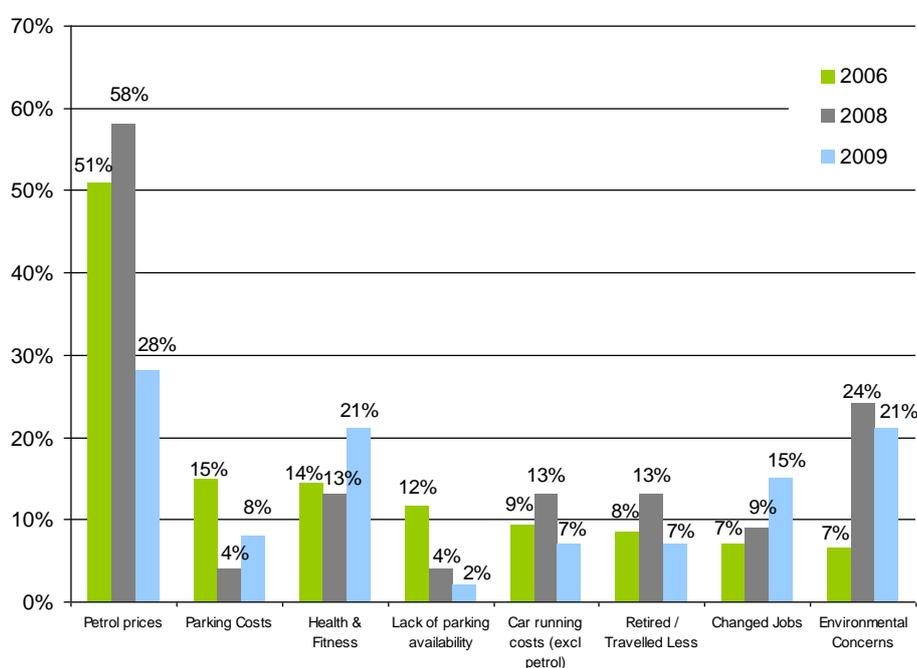
Factor	Assessment for Melbourne 2004-09	Overall Impact
Population Growth	Stronger than long-term average population growth in Melbourne	High
CBD employment growth	More than 4% annual CBD growth rates between 2004 and 2006 (Melbourne City Council, 2006)	High
Petrol price rises	80% rise from March 2004 to July 2008	High
Parking price rises (CBD)	\$400 levy placed on every CBD car parking space by Melbourne City Council in 2006 and 2007	Low-Med
Road congestion	Seemingly hit a tipping point in the inner city during this period	Med
Transport options and service improvements	Some increased public transport services, but not significant, except for some major bus service improvements driving recent bus growth	Low
Attitudes pre-disposing the market to sustainable transport options	Some evidence of stronger attitudes relating to the environment and health & fitness in latter part of this period	Med
Ticketing policy changes	Removal of “zone 3” effectively reducing the cost of multi-zone travel, and introduction of reduced off-peak fares (e.g. \$3 all-day travel on any weekend)	Med
Increased numbers of international students	Melbourne has experienced an increase in the number of international students living and studying in central areas well-serviced by public transport	Low

Elasticity modelling undertaken by DOT during 2008 supports the factors outlined in table 2 as being the main drivers of the changing demand. This modelling estimated that the increased train patronage could be attributed to the strength and location of population growth (32%), petrol price rises (26%), CBD employment growth (17%) and parking price rises (4%) (DOT, 2008). This left a significant portion of the growth ‘unexplained’. This was hypothesised to be a combination of factors that could not easily be measured or inputted

into the model (road congestion, attitudinal change) as well as the synergistic impact of the ‘perfect storm’ of factors occurring simultaneously.

Market research asking respondents who had reduced their use of vehicles in the previous twelve months to state the main reasons for their behaviour change also supported the reasons outlined in table 2, and shows some changes in these factors over time (DOT 2006) (Metlink 2008, 2009).

As is shown in figure 7, petrol prices have continued to be the main ‘stated’ reason for reduced vehicle usage, even in research conducted by Metlink in February 2009, when petrol prices had fallen considerably (although its importance had diminished relative to other factors). Interestingly, the rate that “health & fitness” was mentioned increased to be the equal second most important reason in 2009, along with environmental concerns, which went from being a very minor issue in 2006 to a key ‘stated’ driver in 2008 and 2009.



Sources: DOT Market Segmentation Study (2006) n = 1,352 valid respondents  
Metlink Mobility Choices Research (2008) n = 163 valid respondents  
Metlink Mobility Choices Research (2009) n = 99 valid respondents

**FIGURE 7: Top Eight Stated Reasons for Reduced Vehicle Usage (2006-2009)**

The rise of the attitudes relating to the environment and health & fitness supports the view that there is an emerging segment in the market focused on making consumer decisions that support ‘sustainability issues’. This segment has been referred to by many as the LOHAS segment, reflecting a desire to live a Lifestyle of Health And Sustainability. The Mobium Group (2007) estimated that 26% of the adult population were “LOHAS aligned” and 8% of the population were LOHAS leaders – that is, those who are most active in making consumer decisions that factor in health and sustainability issues. This segment was hypothesised to be growing strongly, with projections that spending aligned to LOHAS principles would reach \$21 billion in Australia by 2010. Transport and Leisure, where “low impact commuting” is a key driver of consumer behaviour, is one of the six key market elements identified by the Mobium Group.

Of all the factors identified as potential drivers of public transport patronage growth, several would be thought to operate at roughly the same levels in Melbourne as in other capital cities (e.g. petrol prices, impacts of the economic boom on employment). However, other factors, such as road congestion, parking costs (and availability) and attitudinal change, are thought to operate somewhat differently in Melbourne compared with the rest of Australia.

## 5. IMPACT OF THE GLOBAL FINANCIAL CRISIS (GFC) ON TRAVEL DEMAND

The discussion up until this point has been on the 2004-2009 period prior to the major impacts of the Global Financial Crisis (GFC). The GFC is hypothesised to have the potential to impact travel demand and public transport patronage in two distinct ways:

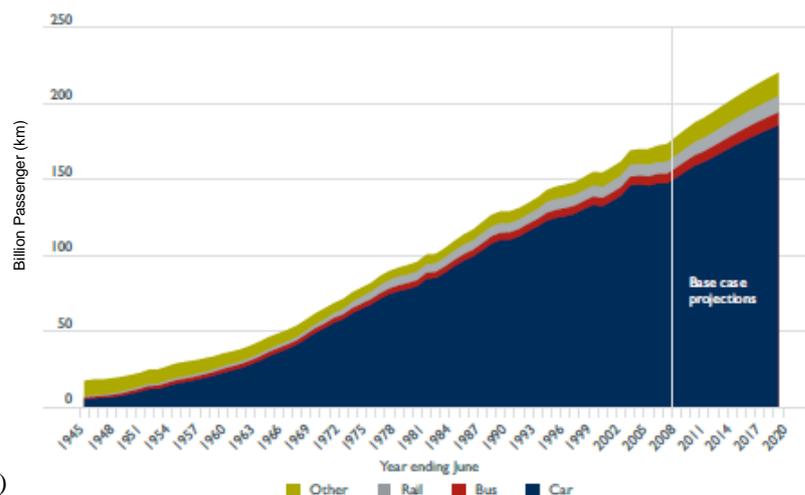
1. As household budgets are tightened in response to uncertain economic conditions, people are more likely to select the travel mode that is most economical for them, which will often be public transport, resulting in **increased** public transport patronage; and
2. As fewer people travel to work, shop, attend social and special events etc., particularly in the CBD, and particularly as unemployment increases, this can result in a **reduction** in overall travel and therefore also public transport patronage.

At the time of writing this paper, the GFC has resulted in significantly reduced economic and consumer confidence (Westpac – Melbourne Institute, 2009), but only a slight increase in the unemployment rate, rising from 4.4% in September 2008 to only 5.4% in April 2009 (ABS, 2009). In an environment of still healthy employment levels, but reduced confidence in the future and increased ‘belt tightening’, one might expect continued strong growth in public transport patronage. In fact, the overall public transport patronage growth rate in Melbourne reached a peak of 13.2% in the twelve months ending March 2009, encompassing the early period of the GFC. The impacts of the GFC, however, may well result in higher unemployment levels, as well as higher rates of underemployment, which has already increased from 10.0% in May 2008 to 13.4% in May 2009 (ABS, 2009). This has been at least partly driven by several large firms asking employees to go to four-day weeks at reduced pay (Schreider, 2009) and to take unpaid leave (news.com.au, 2009). It would be hypothesised that these impacts would negatively impact on overall trip rates, as well as public transport patronage growth.

## 6. FORECASTING FUTURE PUBLIC TRANSPORT PATRONAGE

If the 1960s and 1970s could be characterised in Melbourne as a period of declining public transport patronage as car ownership became increasingly more affordable, and the period 1980-2004 characterised as a period of stable mode share between private vehicle and public transport travel, does this mean we have entered a new paradigm of mode choice in the post-2004 era? Can we expect double-digit annual growth rates for an extended period of time? Or is this just a minor blip in the longer-term trends of public transport?

The Bureau of Infrastructure, Transport, Regional Development and Local Government (BITRE) has seemingly formed an initial view in its Base Case projections shown in figure 8. The recent levelling off of car travel in 2004-2008 period (despite population growth) is shown clearly in this graph across not just Melbourne, but eight Australian capital cities. If this trend continued, it would clearly represent a paradigm shift and have major policy implications.



Source: BITRE (2009)

**FIGURE 8: Eight Capital Cities Motorised Passenger Task**

The base case projections shown (without a detailed discussion) however, do **not** show a continuation of this trend, but rather represent a return to previous trends, and confine the recent travel demand changes to a temporary ‘blip’ in the graph. Such assumptions should not remain unquestioned, as they can provide a misleading setting for policy and investment decisions.

Forecasting future trends can be problematic even in the middle of stable eras, but proves to be particularly difficult in times of change. The key to forecasting future travel demand trends are the answers to many imponderable questions, which we simply do not know at this time. Examples of such questions are:

1. What will the price of petrol be over the next decade?
2. When and how will the GFC end?
3. What technological advance will influence how we travel in the next decade?
4. How strong will the growth in attitudes relating to the environment and health & fitness be over the next decade?
5. Where will Government funding of transport be focused over the next decade?
6. What will the shape of Melbourne look like in 2030 relative to Melbourne in 2009?

Notwithstanding these major challenges, it is critical that we improve our ability to accurately forecast changes in travel demand in order that scarce Government investment dollars can be directed to the right places at the right time. The best evidence we have at the moment, and a review of the recent dramatic changes to travel demand, have led us to the conclusion that there may be a greater underlying receptiveness to sustainable transport modes in Melbourne, thus supporting increased use of public transport and cycling as modes of travel relative to private vehicle. More work is required to better understand these attitudes, how strong their influence has been, and how they might grow and spread in the future. It is our view that incorporating such attitudinal changes into the transport network modelling process is critical to reaching a point where we can confidently stand behind the transport forecasts being made. This inevitably involves a detailed quantification of personal attitudes, and an accurate forecast of future attitudes, which is in no sense an easy task. Transport network models, nevertheless, remain the best way to develop long-term forecasts of travel demand.

## **7. SUMMARY AND CONCLUSION**

The second half of this decade has seen changes in travel demand in Melbourne. There are implications if these changes represent the beginning of a new longer-term trend. The nature of the key drivers of shifting travel demand (e.g. petrol prices, economic growth, etc.) means that it is difficult to predict each individual key driver, let alone the combined effect of multiple drivers on the travel demand outcome. Regardless, accurate travel demand forecasting is more critical now than perhaps it has ever been.

What differentiates this recent trend from our understanding of previous travel demand changes is the impact that attitudinal changes may be having on the outcome. Our market research highlights that the more significant changes that have taken place in Melbourne as compared with other capital cities are mirrored by stronger attitudes relating in particular to the environment and sustainability issues more generally. It is entirely possible that these attitudes form a necessary ingredient in the recipe for fast shifts in transport mode that are increasingly a focus of Governments around the world.

Currently, the transport network models used to forecast travel demand do not have the capability to use these attitudes as inputs. It is critical, therefore, that we understand the way in which these attitudes are influencing mode choice, and are able to quantify them in a way that is compatible with the workings of the transport models. These improvements will ensure that the transport network models continue to be the optimum way of predicting future travel demand for Melbourne.

## **ACKNOWLEDGEMENTS**

The authors would like to acknowledge the support provided by the Department of Transport and Metlink, and the market research suppliers involved in researching these important issues.

## **ABBREVIATIONS USED IN THIS PAPER**

ABS – Australian Bureau of Statistics

BITRE - Bureau of Infrastructure, Transport, Regional Development and Local Government

CBD – Central Business District

DOT – Department of Transport, Victoria

GFC – Global Financial Crisis

LGA – Local Government Area

LOHAS – Lifestyles of Health and Sustainability

MITM – Melbourne Integrated Transport Model

VATS - Victorian Activity and Travel Survey (run in the 1990s)

VISTA - Victorian Integrated Survey of Travel and Activity (2007)

## **REFERENCES**

Australian Bureau of Statistics (2009). Labour Force, Australia, May 2009. Australian Bureau of Statistics, Canberra.

Bureau of Infrastructure, Transport, Regional Development and Local Government (2009). Urban Passenger Transport : How People Move About in Australian Cities. Information Sheet 31.

Department of Transport (2006). Market Segmentation Project. Department of Transport: Melbourne

Department of Transport (2008). Understanding Patronage Growth. Department of Transport: Melbourne

Department of Transport (2008). Walking and Cycling: Census Analysis. Department of Transport: Melbourne.

Department of Transport (2009). Official Patronage Series, March 2009. Department of Transport: Melbourne

Department of Transport (2009). Customer Satisfaction Monitor – train, March 2009. Department of Transport: Melbourne.

Department of Transport (2009). Melbourne's new Bumblebee (C2 Class) trams, [www.transport.vic.gov.au/DOI/Internet/transport.nrf](http://www.transport.vic.gov.au/DOI/Internet/transport.nrf)

Melbourne City Council (2006). Census of Land Use and Employment (CLUE), [www.melbourne.vic.gov.au/CLUE](http://www.melbourne.vic.gov.au/CLUE)

Metlink (2008). Mobility Choices Market Research I, Metlink, Melbourne

Metlink (2009). Mobility Choices Market Research II, Metlink, Melbourne

Mobium Group (2007). Living LOHAS. Melbourne.

Moynihan, S. (2006). Bike craze hits top gear, *The Age*, 6 June, 2006.

News.com.au (2009). Accounting firm PricewaterhouseCoopers (PwC) asks staff to take unpaid leave. 6 May, 2009. <http://www.news.com.au/business/story/0,27753,25437048-462,00.html>

Schneiders (2009). Cut hours, accounting firm urges, *The Age*, 30 January, 2009.

SKM (2008). Victorian Activity and Travel Survey Congestion Analysis. Sinclair Knight Merz: Melbourne.

Westpac – Melbourne Institute (2009). Westpac-Melbourne Institute Survey of Consumer Sentiment, The University of Melbourne, Parkville, VIC

Victorian Activity and Travel Survey (VATS) (1994-99). Department of Transport: Melbourne.

Victorian Integrated Survey of Travel and Activity (VISTA) (2007). Department of Transport: Melbourne.