

JOURNEY TO WORK PATTERNS IN REGIONAL VICTORIA

Analysis of Census data 1996 to 2006

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1. INTRODUCTION

Work journeys make up a significant proportion of the travel profile, and with the demand that work journeys place on transport infrastructure at weekday peak congestion times, work journey data provides a valuable input to model current and future transport planning and service provisions.

As the population of Victoria increases, managing growth becomes progressively important. Victoria in Future 2008 figures project regional Victoria's population to grow by almost half a million people by 2036 (Department of Planning and Community Development, 2009). The Victorian Government has committed to creating a Prosperous Regional Victoria, ensuring that population growth is balanced and regional centres are thriving, creating a state of many choices, particularly greater living and working opportunities (Regional Development Victoria, 2011).

Taking regional growth into consideration, the purpose of this paper is to understand the relationship between regional areas and Melbourne. Journey to Work data in 2006 indicated that almost 11,000 work journeys to the Melbourne Statistical Division (MSD) were from the major regional LGAs of Ballarat, Greater Bendigo, Greater Geelong, and Latrobe. Time series census data indicates that in these four regional LGAs the number of employed residents increased by almost 24 percent (to over 192,000) between 1996 and 2006 (ABS, 1996, 2001, 2006). An increasing labour force places an increased demand on transport systems and infrastructure particularly in peak congestion periods. Given the number of work journeys generated from these LGAs and their contribution to peak period congestion, this paper investigates journeys from these four regional LGAs across the three Census periods of 1996, 2001 and 2006. Analysing historical trends in work journeys from regional LGAs to the MSD may provide a stronger understanding of transport demand.

Further, understanding inter regional connectivity becomes increasingly important to adequately manage transport demand and the delivery of regional transport services. Utilising the journey to work data, this paper also analyses historical patterns of work journeys between the regional LGAs, providing a basis for understanding future regional transport priorities.

Historical trends in mode share may provide an evidence base for informed decision making in transport service planning. Therefore, this paper will investigate the trend in travel modes from regional LGAs across the three census periods.

Proximity is analysed against total work journeys to gain a better understanding of what role proximity plays in the volume of work journeys from regional LGAs.

Considering the above, the paper aims to address four key questions:

1. What are the changes across the census periods in work journeys from regional LGAs to the MSD?
2. What are the changes in mode share for work journeys from regional LGAs to the MSD?
3. Is there a significant pattern in work journeys between the regional LGAs studied?
4. What role (if any) does proximity play in determining the volume of work journeys from the four regional LGAs to the MSD and between the four regional LGAs?

This paper does not seek to investigate the reasons or influences behind the changes in work journeys patterns among the regional LGAs analysed. A number of variables, including and not limited to population changes, employment patterns, age profile and infrastructure investments could all be contributing factors to these changes. While all of the above are subject to variations through time, proximity (distance between LGAs) remains constant and is consequently explored as a variable in work journey patterns.

2. LITERATURE REVIEW

Precedent papers that specifically examine journey to work patterns for regional LGAs are few. Papers that contribute to parts of this discussion are summarised below.

A 2001 Victorian based study by Harbutt, Walker and Morris (2004) identified car-based travel as the primary means of travel in regional areas. The ongoing concern of how to best service those in regional areas that have limited or no access to cars was a primary focus. The study looked at the emerging lessons from the different approaches of three Victorian State Government projects that focused on addressing rural and regional issues of transport disadvantage, accessibility and mobility. The finding was that the approach provided a stronger understanding of the issues and testing solutions, as opposed to measuring the outcomes of these processes.

Parker's study in 2004 looks at journey to work patterns across Australia and Melbourne from 1976 to 2001. Focusing specifically on car ownership and work journeys the paper highlights that there had been a significant increase in car journeys, with a decline in public transport use and walking and cycling for sixteen statistical divisions in Melbourne and eight rural Victorian cities. Further, commuter patterns in the eight regional centres were very similar to that of the outer urban areas of Melbourne, despite the fact that these regional journeys are much shorter. The paper concludes that a number of behavioural change programs are required that aim to reduce single occupancy car commutes and increase alternate modes of transport such as public and non-motorised modes.

Also, a study on the Latrobe Valley by RMIT (1996) utilising the Victorian Activity and Travel Survey (VATS) data found that journey to work interactions identified that a significant proportion of employed persons within the study area did not work in their area of residence. Public transport had a relatively low representation of all journey types, with over eighty per cent of all trips made by car. The report concludes that there are noticeable travel movements and patterns contained within the Shire, and the various strengths of different centres compliment one another, suggesting that an opportunity exists to plan for a more integrated Shire.

The Work and Family Balance in Regional Victoria . A Pilot Project draws on statistical data to analyse four Victorian regional areas (Greater Bendigo, Colac, Horsham and Latrobe City) with an aim of identifying the impacts on work and family balance, the integration of work and family balance, and services that may be capable of supporting a better balance. In relation to transport, similar trends in response across the four regional areas were identified, with a greater need for public transport and the concern of rising petrol prices. The report suggests as an option, more innovative and responsive infrastructure that focuses on linking the spheres of paid work, family responsibilities and community engagement in such initiatives+ (Charlesworth, Campbell, Fridell [RMIT] in conjunction with IRV and RDV, 2007)

Shin and Inbakaran (2009) analysed the Income and Journey to Work Patterns for Melbourne by examining the relationships between origin, destination, mode of journey to work, and a worker's income. The results showed pronounced regional variation in incomes and the corresponding journey to work mode share. It concluded that if the employed person can drive a vehicle for the journey to work trip, whether that vehicle was driven directly to the place of work or left at a public-transport stop, they are likely to have a higher income than those who do not have such access.

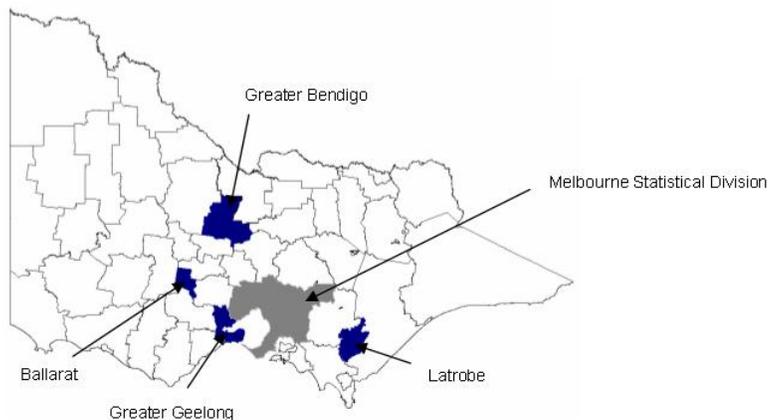
3. METHODOLOGY

This paper compares journey to work figures across three collection periods for four regional LGAs, identifying the number of work-journeys between each of the LGAs studied and the work journeys from each regional LGA to the MSD.

The four regional LGAs included in this study area draw from the areas chosen for the Victorian Integrated Survey of Travel and Activity 2009 (VISTA 09) travel survey. VISTA 09 also included Greater Shepparton in its survey area, however the 1996 census journey to work data was only collected for a selected number of LGAs that had a relative importance of journey and transport issues in densely populated areas (Robertson, 2000). Four regional LGAs of Ballarat, Greater Bendigo, Greater Geelong and Latrobe were included in this

collection, and in order to provide a comparative analysis of over more than two Census points, the four regional LGAs above are analysed in this paper and Greater Shepparton has been excluded.

Figure 1: Map of Regional LGAs analysed



Historically, journey to work data suggests that a high concentration of work journeys start and finish within the same LGA (in 2006 between 80 to 85 per cent of all journeys for the four regional LGAs). However, this paper focuses on the work journeys to the MSD and between the areas identified rather than those work journeys entirely within the regional LGAs studied.

For each regional LGA studied in the analysis section, a breakdown of work journeys for 2006 is provided as a point of reference to assist the reader with understanding the proportion of work journeys that are not self-contained.

3.2 The Census Survey

The data analysed in this paper is the journey to work information collected from the 1996, 2001 and 2006 Census of Population and Housing. The data has been extracted at a Statistical Local Area (SLA) level for the three Census periods and aggregated to an LGA level. The data is based on a person's SLA of enumeration and is only applicable to employed persons aged 15 years and over.

In order to understand the travel patterns of work travellers, those who worked from home or did not travel on Census day have been excluded from the journey to work figures analysed. Overseas visitors are also excluded.

In relation to work journeys to the MSD, those who travelled from regional LGAs to Melbourne (people who provided an unidentifiable Melbourne address as their workplace, or worked across a number of Melbourne addresses) were not included in 2001 figures, but were included in 2006 figures.

3.3 Proximity

The proximity between regional LGAs and to the MSD is analysed. Any reference to proximity in subsequent paragraphs is derived using a measurement from the centre of the LGAs. The MSD is measured from the centre of the 3000 postcode. The following table identifies the relative proximity between the areas analysed:

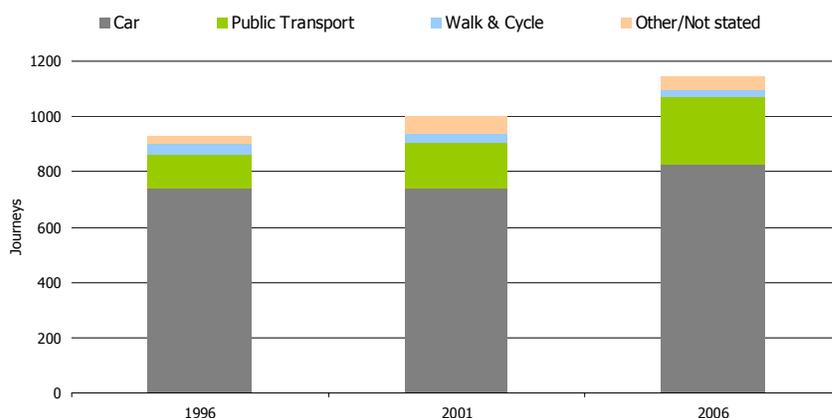
Table 1: Proximity of Regional LGAs and MSD (kilometres)

	Distance from MSD	Greater Geelong (C)	Ballarat	Greater Bendigo (C)	Latrobe (C)
MSD		51	110	130	140
Greater Geelong (C)	51		85	148	176
Ballarat (C)	110	85		106	250
Greater Bendigo (C)	130	148	106		247
Latrobe (C)	140	176	250	247	

4. ANALYSIS of work journeys from the regional lgaS TO THE MSD

This section explores the Census journey to work data for the four regional LGAs for the 1996, 2001 and 2006 periods.

Figure 2: Journey to work, Ballarat LGA to the MSD

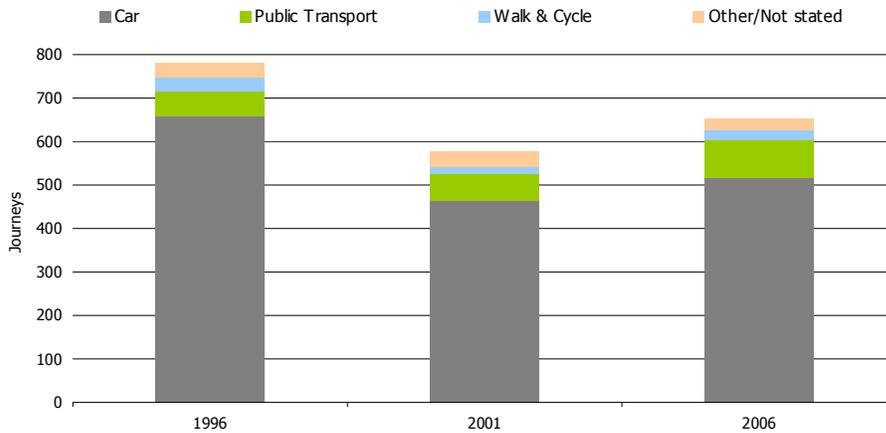


*'Public Transport' refers to all journeys that include the use of at least one public transport mode
'Car' incorporates all journeys completed by 'car as driver' and 'car as passenger'*

Journey to work - Ballarat LGA to the MSD

In the 2006 Census, 1,145 people commuted to the MSD for work. As seen in Figure 2, the number of people commuting from the Ballarat LGA to the MSD for work increased overall across the 1996-2006 period, with the greatest increase between the 2001 and 2006. Despite only a marginal increase in total work journeys from 1996 to 2001, a greater number of work journeys were made by public transport (167 journeys), which created a marginal mode shift towards public transport. The public transport mode share of around 16 per cent in 2001 increased to 21 per cent in 2006. Despite the growing trend in public transport work journeys, in 2006 the vast majority of work journeys from Ballarat to the MSD were completed by car (72 per cent).

Figure 3: Journey to work, Greater Bendigo to the MSD

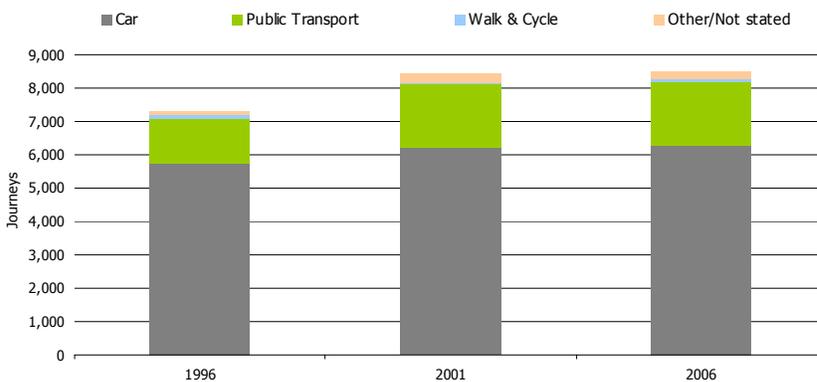


*'Public Transport' refers to all journeys that include the use of at least one public transport mode
 'Car' incorporates all journeys completed by 'car as driver' and 'car as passenger'*

Journeys to work – Greater Bendigo LGA to the MSD

In the 2006 Census, 652 people (2 per cent of total work journeys from Greater Bendigo LGA) commuted to the MSD for work. As seen in Figure 3, the number of people commuting from Greater Bendigo to Melbourne for work decreased overall across the 1996-2006 period, but more journeys were recorded in 2006 than in 2001. While the vast majority of these journeys were by car, a slightly larger number commuted to the MSD using public transport in 2006 (an increase of 25 journeys). As a percentage of mode share, public transport journeys in 2006 represented 13 per cent of total work journeys to the MSD, compared to 7 per cent in 1996. These numbers are relatively low, and hence no conclusive analysis can be drawn from the figures. The percentage of work journeys by car to the MSD decreased across the three Census periods, but remained the predominant method of transport (79 per cent) in 2006.

Figure 4: Journey to work, Greater Geelong to the MSD

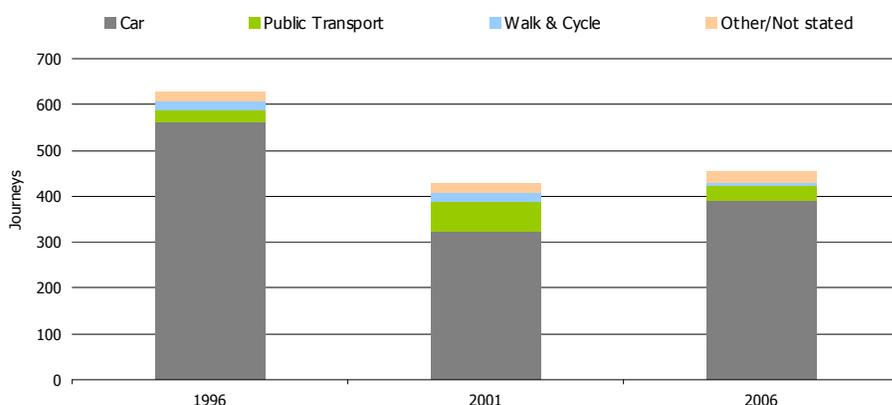


*'Public Transport' refers to all journeys that include the use of at least one public transport mode
 'Car' incorporates all journeys completed by 'car as driver' and 'car as passenger'*

Journeys to Work – Greater Geelong LGA to the MSD

In the 2006 Census, 8,495 work journeys to the MSD were recorded. As seen in figure 4, the number of people commuting from Greater Geelong to the MSD increased across the 1996-2001 period, and remained stable across the 2001-2006 periods. Across the ten year period, as a percentage of total work journeys generated from Greater Geelong, MSD work journeys have remained relatively unaltered. Despite a 10 per cent increase in total work journeys generated from the Greater Geelong LGA between the 2001 to the 2006 Census collection, work journeys to the MSD across this period increased by less than 1 per cent (58 work journeys). In the 2006 Census, 74 per cent of work journeys were made by car (6,273 journeys), with 23 per cent of journeys incorporating public transport (1,914 journeys). Compared to the 1996 Census, 547 more work journeys to the MSD by car were recorded in 2006, while public transport journeys increased by 552.

Figure 5: Journey to work, Latrobe to the MSD



*'Public Transport' refers to all journeys that include the use of at least one public transport mode
 'Car' incorporates all journeys completed by 'car as driver' and 'car as passenger'*

Journeys to work – Latrobe LGA to the MSD

In the 2006 Census, 453 work journeys were recorded to the MSD from Latrobe. As seen in figure 5, the number of people commuting from Latrobe to the MSD for work decreased across the 1996-2001 period, from 628 to 431, and then increased slightly in the 2006 collection. Across this period, the majority of work journeys were made by car. The number public transport work journeys to the MSD decreased between 2001 and 2006, from 65 to 35 journeys. Of the regional LGAs analysed, Latrobe has the largest decrease in work journeys to the MSD from 1996 to 2006 (175 journeys). The proportion of public transport work journeys to the MSD was particularly low (8 per cent). Work journeys to the MSD represented 2 per cent of total work journeys generated by Latrobe in 2006.

4.1 ANALYSIS of work journeys between the regional LGAs

Table 2: Number of journeys to and from Ballarat LGA (2006)

	To Ballarat	From Ballarat
Within Ballarat	26,063	26,063
MSD	408	1,145
Greater Geelong	165	163
Greater Bendigo	44	36
Latrobe	9	6
All other	5,344	4,085
Total journeys	32,033	31,498

Journeys to work – Ballarat LGA to Regional LGAs

From the Ballarat LGA, Greater Geelong received the largest number of work journeys of the four regional LGAs studied. In 2006, 163 people made this journey to work, an increase of 51 from the 2001 figure, and 58 from the 1996 figure. In 2006, 36 people made the journey from Ballarat to Greater Bendigo for work, a slight increase from the 2001 figure of 28 people. However, as a percentage of total work journeys generated from Ballarat (0.65 per cent in 2006), the number of journeys across the three time periods to the other regional LGAs studied is low.

Despite the increase in work journeys to Greater Geelong over the three time periods, the above data suggests that, in terms of total work journeys generated from the Ballarat LGA across the Census periods, a low number of work journeys to the other regional LGAs is evident.

Journeys to work – Regional LGAs to Ballarat

Among people who commuted from another regional LGA to Ballarat for work, the greatest number came from Greater Geelong (165 people), with 44 workers journeying from Greater Bendigo to Ballarat for work. In the decade 1996 to 2006, around 70 more people began making the journey from Greater Geelong to

Ballarat for work (74 per cent increase). Less than 60 people journeyed to Ballarat from any of the other regional LGAs in 2006 (Table 2).

A relatively low proportion of total work journeys from each of the regional LGAs travelling to the Ballarat LGA suggest that, in 2006, the Ballarat LGA is not a strong attractor of work journeys from the other regional LGAs studied.

Table 3: Number of journeys to and from Greater Bendigo LGA (2006)

	To Greater Bendigo	From Greater Bendigo
Within Greater Bendigo	28,152	28,152
MSD	306	652
Greater Geelong	13	12
Ballarat	36	44
Latrobe	-	-
All other	1,822	5,028
Total journeys	30,329	33,888

Journeys to work – Greater Bendigo LGA to Regional LGAs

Of journeys to work for the measured regional LGAs, the greatest number of commutes from Greater Bendigo were to Ballarat (44 journeys - 20 more than the number recorded in 2001). Low numbers of people commuted to Greater Geelong and Latrobe. Given the relatively low number of work journeys to other regional LGAs as a percentage of the total work journeys commencing in Greater Bendigo (0.33 per cent in 2006), it appears that over the ten year period, Greater Bendigo generated a low number of work journeys to the other Regional LGAs measured.

Journeys to work – Regional LGAs to Greater Bendigo

Among people who commuted from another regional LGA to Greater Bendigo for work, the greatest number came from Ballarat, though the number of journeys recorded was less than 40. In 2006, the total number of work journeys from Regional LGAs to Greater Bendigo (76 journeys) is 30 per cent less than that of work journeys from Greater Bendigo to other regional LGAs (112 journeys). Proportionally, a very low percentage of work journeys commencing in regional LGAs finished in the Greater Bendigo LGA.

Table 4: Number of journeys to and from Greater Geelong LGA (2006)

	To Greater Geelong	From Greater Geelong
Within Greater Geelong	53,197	53,197
MSD	2,493	8,495
Ballarat	163	165
Greater Bendigo	12	13
Latrobe	13	13
All other	6,048	9,616
Total Journeys	61,926	71,499

Journeys to work – Greater Geelong LGA to Regional LGAs

Of journeys to work from Greater Geelong to the measured regional LGAs, the greatest proportion of commuters to other regional LGAs was to Ballarat. 165 work journeys were recorded in the 2006 Census, an increase from just under 100 in the 1996 Census and 124 in 2001. Excluding Ballarat, less than 40 journeys from Greater Geelong to any other of the regional LGAs were recorded in 2006. Overall, work journeys to the other regional LGAs measured represent a low proportion of the total work journeys generated from Greater Geelong.

Journeys to work – Regional LGAs to Greater Geelong

Among work journeys from other regional LGAs to Greater Geelong, the greatest number came from Ballarat (163 journeys), with less than 30 work journeys coming from the other regional LGAs combined. The number of people coming from Ballarat has increased across the 1996-2006 collection periods, from 105 in 1996. The relatively low proportion of work journeys from other regional LGAs to Greater Geelong suggests that Greater Geelong is not a strong attractor of work journey from the four regional LGAs analysed.

Table 5: Total number of journeys to and from Latrobe LGA (2006)

	To Latrobe	From Latrobe
Within Latrobe	19,300	19,300
MSD	463	453
Greater Geelong	13	13
Ballarat	6	9
Greater Bendigo	-	-
All other	3,306	3,587
Total journeys	23,088	23,362

Journeys to work – Latrobe LGA to Regional LGAs

Work journeys to the other regional LGAs analysed represented less than 0.09 per cent of total work journeys generated from Latrobe. The highest number of journeys to any of the Regional LGAs was to Greater Geelong (13 journeys).

Journeys to work – Regional LGAs to Latrobe

In 2006, of the journeys from other regional LGAs to Latrobe for work, the greatest number came from Greater Geelong (13 journeys). It would appear that, as a work journey attractor, the Latrobe LGA is not a strong attractor of work journeys from the other regional LGAs studied.

5. Discussion

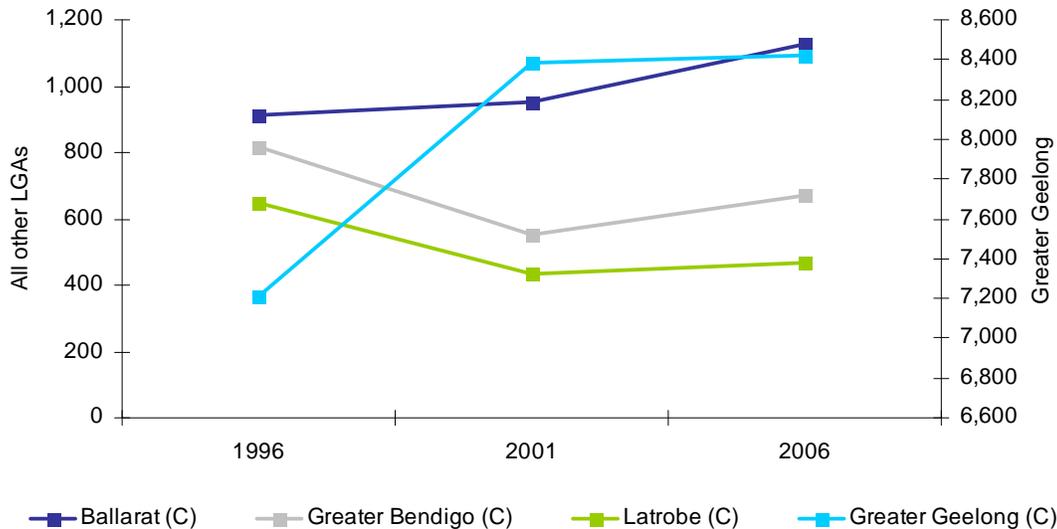
5.1 Work Journeys to the MSD

The volume of work journeys to the MSD varied throughout the four regional LGAs across the three Census collection points. Of the four regional LGAs examined the highest number of work journeys was generated from Greater Geelong. The total sum of work journeys from Greater Geelong in 2006 to the MSD (8,495) was over 7,000 more than the next highest regional LGA (Ballarat, 1,145 journeys). However, what is interesting about Greater Geelong is the fact that from the 1996 to 2001 census periods, work journeys to the MSD increased by 16 per cent (1,138 journeys), while from 2001 to 2006, journeys to the MSD increased by only 1 per cent (58 journeys). This trend provides a valuable insight into the changes in transport demand for work journeys from Greater Geelong to the MSD and may provide important input into future travel demand planning.

Across the ten year period, Ballarat and Greater Geelong experienced an increase in total work journeys to the MSD at each collection point. In contrast, Greater Bendigo and Latrobe both experienced an overall decrease in work journeys to the MSD between 1996 and 2006. Despite modest increases between 2001 and 2006, Greater Bendigo and Latrobe still recorded less total work journeys to the MSD than in 1996.

Aggregating the four LGAs over the three collection periods, the pattern of journeys from each of the regions to the MSD are varied. Analysis of work journeys alone will not provide any answers as to what is driving the changes. It is clear that an understanding of other factors from within the LGA, such as changes in population, age and employment profile is required to identify the core elements driving change.

Figure 6: Change in work journeys to MSD from regional LGAs 1996, 2001, 2006



Despite the declining number of work journeys from Greater Bendigo and Latrobe in 2001, the aggregate trend from 2001 to 2006 shows an increase in overall work journeys from all four regional LGAs to the MSD. Analysis of the 2011 journey to work Census data may provide a more conclusive base for understanding future transport demand.

As a percentage of the total work journeys from regional LGAs to the MSD, all of the LGAs demonstrated an overall declining trend in the proportion of total work journeys from the relevant LGA to the MSD. It is assumed that a number of factors may have influenced these changes and would be worth exploring in further research as discussed in section 6.

Table 6: Percentage of Total Work Journeys from Regional LGAs to the MSD 1996, 2001, 2006

	1996	2001	2006
Ballarat	3.8%	3.6%	3.6%
Greater Bendigo	3.1%	2.0%	1.9%
Greater Geelong	12.3%	13.1%	11.9%
Latrobe	3.1%	2.1%	1.9%

5.1.1 Mode Share – Journeys by Car

In terms of mode split, the predominant method of travel choice from the regional LGAs analysed to the MSD across the ten year period was by car (as driver and as passenger). In the 2006 Census, the percentage of journeys by car, compared to 1996, had decreased by 5 per cent, however, in terms of actual journeys by car increased by 264 work journeys (7,968). As an average, 75 per cent of work journeys across the four regional LGAs were by car, reinforcing its predominance as the primary method of travel.

Regional Victoria has received a number of State and Federal-funded road infrastructure projects, particularly in the past ten years (for example, the Greater Geelong Ring Road, Deer Park Bypass, Calder Highway Upgrade, and Pakenham Bypass). These projects (some completed and some still in progress) could have an effect on the trends in work journey travel volume and mode shares from Regional LGAs to the MSD. Parallel to these infrastructure enhancements, Census data for 2011 will be critical in providing a more detailed understanding of the volume of work journeys by car to the MSD from regional LGAs.

5.1.2 Mode Share – Journeys by Public Transport

The total number of journeys to the MSD from regional LGAs by Public Transport increased by 664 journeys from 1996 to 2006 (2,242 work journeys). All LGAs experienced a net increase in public transport work journeys from 1996 to 2006.

Ballarat experienced the highest percentage of growth in Public Transport work journeys to the MSD across the ten year period, increasing from 125 to 246 journeys (97 per cent increase from 1996 to 2006). Greater Geelong had the next greatest percentage of growth, increasing from 1,362 to 1,914 journeys (41 per cent increase across the ten year period). The other three LGAs did not experience increases or decreases of any significance. There have been a significant number of Public transport projects in Regional Victoria in the past decade, some of which were not completed at the time of the 2006 census collection. One particular major project was the Regional Fast Rail project, which was completed on the Ballarat Line in late 2005, and the Greater Geelong, Greater Bendigo and LaTrobe Valley lines in 2006. It is anticipated that the full effect of these infrastructure enhancements on passenger growth will be reflected in the 2011 Census collection.

Despite an overall trend in increasing public transport mode share, work journeys from regional LGAs to the MSD, were still predominantly completed by car.

5.2 Work Journeys between the Regional LGAs

Of the four regional LGAs analysed, varying levels of work journeys between these regional LGAs are evident. However, as a proportion of total work journeys generated from a given regional LGA, these numbers are considerably low.

Ballarat and Greater Geelong share the strongest co-directional work-journeys across all three Census collection periods since 1996. While these co-directional work-journey volumes have increased at each census interval since 1996, the volume of actual trips is low.

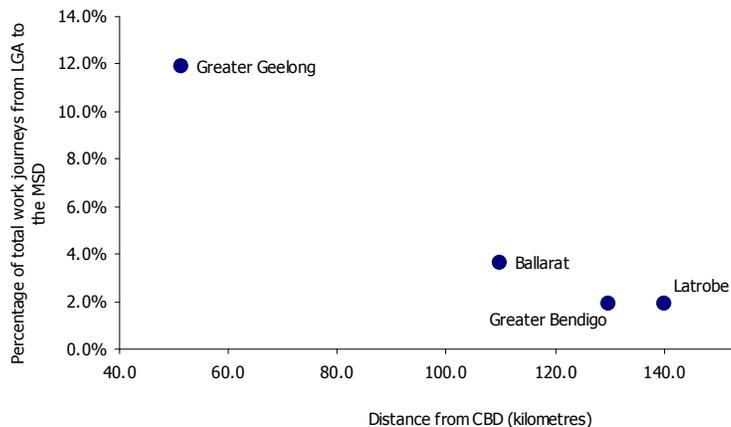
2006 journey to work data suggests that, as a proportion of total work journeys generated, all Regional LGAs produced a higher volume of work journeys to the MSD than they do to any of the regional LGAs identified.

5.3 Proximity as a factor

5.3.1 Factor of proximity to MSD

In 2006, almost 12 per cent of the total work journeys generated from Greater Geelong were to the MSD, the highest percentage of any of the regional LGAs analysed, with the three other regional LGAs demonstrating figures of 4 per cent or less. Greater Geelong is unique from the other regional LGAs in this study for two reasons. In terms of proximity, Greater Geelong not only borders the MSD but also is the closest regional LGA to the MSD. When all four regional LGAs are plotted against the percentage of their respective total work journeys to the MSD, it is apparent that the percentage of work journeys to the MSD from each regional LGA decreases as the relative distance of the each LGA from the CBD increases.

Figure 7: Distance from Melbourne CBD vs. % of Total Regional LGA work journeys to MSD - 2006



Whilst a variety of factors (internal and external to each of the regional LGAs measured) could be influencing the number of work journeys to the MSD, it would appear that proximity is one factor that may influence the proportion of work journeys from regional LGAs. Analysis of proximity against total work journeys provides

an understanding of transport demand from regional LGAs to the MSD and could be applied to other regional LGAs to assist in planning for future transport requirements.

5.3.2 Factor of proximity between regional LGAs

Despite the low number of work journeys between regional LGAs, the data suggests that proximity between the four regional LGAs is a factor in determining the volume of work journeys between them. This is evident in every regional LGA analysed, where the closest regional LGA in proximity received the largest number of work journeys. An example of this is Ballarat, where more work journeys were recorded to Greater Geelong (85 kms) than the other three regional LGAs (all over 100 kms).

Excluding the predominance of self contained work journeys, in terms of proximity, the MSD ranks a much greater attractor of work journeys from the regional LGAs than journeys between the regional LGAs analysed, even when regional LGAs are within closer proximity of each other compared to the MSD. An example is Ballarat, where in the 2006 Census, 1,145 work journeys to the MSD were recorded, whereas only 163 were recorded to Greater Geelong, a closer LGA in terms of distance (85 kilometres as opposed to 110 kilometres from Ballarat to the MSD).

6. conclusion & further research

Journey to work evidence suggests that of the total work journeys generated by the four regional LGAs, a declining percentage of total journeys are to the MSD. Further, a net decrease in work journey volumes is witnessed in key regional LGAs of Greater Bendigo and Latrobe from 1996 to 2006. Despite varying trends across the regional LGAs analysed, it is apparent that work journeys from all four LGAs to the MSD show the same increasing pattern from the 2001 to 2006 collections. 2011 Census journey to work data may provide a more conclusive base for understanding future transport demand.

With almost 11,000 journeys ending in the MSD from the four regional LGAs in 2006, combined with the increasing trend in total journeys, it will continue to be important that work journeys are considered as an input into appropriate transport infrastructure and planning.

Car journeys continue to be the predominant method of travel to the MSD from regional LGAs studied. While the total number of car journeys increased between the 1996 and 2006 census, the uptake of public transport from regional LGAs to the MSD had increased by 2006. Understanding changes in mode share provides a valuable insight into preparing for travel choice in the future.

A number of road and public transport infrastructure projects directly and indirectly benefiting these Regional LGAs have been rolled out over the past ten years and the 2011 Census collection will provide a valuable insight into the changes in work journeys parallel to these infrastructure enhancements.

A low volume of work journeys were recorded between the four regional LGAs across the Census collection periods. Ballarat and Geelong share the strongest relationship however the co-directional flow of work journeys is relatively low. This analysis is only reflective of work journeys and does not take into consideration journeys for other purposes. This analysis identifies the importance of incorporating all possible variables to make informed decisions regarding transport demand and planning.

Of the four regional LGAs, proximity appears to play a role in the proportion of total work journeys from an LGA to the MSD. Based on 2006 figures, it is apparent that the percentage of work journeys to the MSD from each regional LGA decreases as the relative distance of each LGA from the Melbourne CBD increases.

In planning for a more prosperous regional Victoria, it is important to acknowledge the various aspects of travel and transport interactions and patterns. While this paper focuses specifically on work journeys, the discussions provided give an understanding of a select number of travel aspects, and can be utilised to promote broader discussions and planning surrounding transport and travel in regional Victoria in the future.

6.1 Further Research

As mentioned in Section 1, a number of internal and external influences on the regional LGAs could be contributing to changes in work journey trends to the MSD and to other regional LGAs. This paper has not

taken into consideration factors including, but not limited to, trends of population age, employed persons based on place of residence, unemployment rates and industry-specific employment trends. The expansion of analysis to incorporate these factors may provide a more detailed understanding of causes and trends of work journeys.

Comparing these trends to more frequently available travel survey data such as VISTA (Victorian Integrated Survey of Travel and Activity) could provide an opportunity to identify some key interim trends that compliment and/or conflict with the trends identified across the Census collection periods. Further, the analysis could be expanded to include other trip purposes such as education, recreational, household and other journeys.

As this analysis has not taken into account the role of neighbouring LGAs as work journey attractors for the Regional LGAs identified, this expansion of analysis could provide a more detailed understanding of regional work journey trends and patterns.

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