

Exploring Trends in Forced Car Ownership in Melbourne

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Abstract

Transport affordability stresses have been acknowledged as a principle concern of transport disadvantage in Australian cities. Transport poverty is a term which has been used to describe low income households who have a little choice but to purchase and use cars to maintain a reasonable lifestyle in mainly fringe urban locations with no transport alternatives and poor walk accessibility. These households have been said to demonstrate 'forced car ownership' (FCO) however evidence suggest the degree of coercion involved is low, but affordability stresses which result are high. Forced car ownership has not been systematically reviewed since the 2001 census. This paper explores the extent to which FCO has changed between the 2001 and the most recent 2011 census.

The analysis shows a 93% increase in FCO households in outer Melbourne between 2001 and 2011. Most increases have been in areas with poor access to public transport or walk accessibility alternatives. Highest growth rates have occurred in outer western, northern and south-eastern fringe and middle Melbourne.

The most pressing policy implication of these changes is that a greater proportion of low income Melbourne residents are vulnerable to financial shocks associated with potential future increases in fuel prices. The obvious implication of this analysis is that fringe Melbourne is facing a potential transport poverty crisis.

1. Introduction

There is now a strong consensus that the suburban fringe of Australian cities is a source of significant transport disadvantage, especially for low income households (Morris and Lane 1979; Dodson et al. 2004; Currie and Senbergs 2007; Currie and Delbosc 2009; Currie and Delbosc 2011). A lack of effective public transport services contributes to dependence on private motor vehicle travel, which can inflict a heavy financial toll on low-income households (Banister 1994; Dodson and Sipe 2006). This has been termed "transport poverty" by some:

"Transport poverty occurs when a household is forced to consume more travel costs than it can reasonably afford, especially costs relating to motor car ownership and usage" (Gleeson and Randolph 2002).

Transport poverty in the Australian context has also been associated with the term 'forced car ownership', a term original coined in the UK:

“Voluntary’ car ownership means that there are adequate substitutes for gaining access to facilities, and that the car is not a necessity. Conversely, ‘forced’ car ownership means that there are no alternatives. In rural areas, there is clear evidence of ‘forced’ car ownership, since cars are owned at lower-income levels and are seen to be one of the items of household expenditure that cannot be foregone”
(Banister 1994).

The central elements of the concept are low income, need for travel, lack of alternatives to the car and hence high car ownership but at high cost to low income groups (Currie and Senbergs 2007).

Past research by the authors identified the suburban fringe of Melbourne as being particularly vulnerable to transport poverty, based on an analysis of the 2001 census (Currie and Senbergs 2007). Since then, Australian cities have seen considerable change; city populations have grown, public transport use has grown significantly and some cities have seen a revitalisation of inner city areas. However, the majority of population growth in many cities has taken place in fringe-urban, greenfield developments far from public transport.

This paper explores how forced car ownership (FCO, or high car ownership on low income) has changed between 2001 and 2011 in Melbourne, Australia. It begins with an outline of past research on transport and low-income households before describing the context of the present research. It then describes the methodology adopted and details the results of the analysis. The paper concludes with a discussion on policy implications.

2. Research Context

“in areas of low [public transport] service provision ...there may be an important element of ‘forced’ car ownership among poorer households who have to make major sacrifices in order to meet car-ownership and running costs;... [in this instance] there is likely to be an *inverse* relationship between car-ownership and social well-being”
(Jones 1987).

Forced car ownership involves low income households who have to spend a high share of their income on running motor cars due to lack of alternatives and need to ensure mobility. In a foundation study of the concept for Australian cities (Currie and Senbergs 2007), the term was found to be ‘value laden’ since it implies some degree of imposition of the costs of ownership against the individuals consent. Indeed subsequent research by the same authors established a strong degree of support for car ownership amongst low income households; however 77% of households interviewed also said they had no choice in the matter and had to pay the high costs involved. Some 54% said transport costs represented a substantial proportion of expenditure (Currie and Delbosc 2011). In this paper we adopt the Forced Car Ownership (FCO) terminology but acknowledge its limitations.

A study of forced car ownership in Melbourne using the 2001 census (Currie and Senbergs 2007) established there were 20,831 households in outer Melbourne suburbs with low public transport service, low income (lowest quartile) and that run two or more cars. These households owned older and smaller cars and spent a high share of income on motoring. They are highly car dependent and travel considerably further than middle Melbourne car owners (+45% more trip/distance) suggesting a higher transport burden in time and cost. The study established some degree of evidence for coping strategies associated with high travel costs on low income including evidence that car sharing (giving lifts to others) was more common in this group.

This research led to a more in-depth study of forced car ownership groups including an analysis of coping behaviours and opinions of the people concerned (Currie and Delbosc 2011). Home affordability was identified as a critical factor driving residential location on the fringe for low income groups. Whilst many FCO households liked the mobility their car provided, 54% wished they could walk/cycle more and 30% sought greater access to public transport. The study also established that FCO households adopt a range of coping strategies to reduce the costs of high car ownership including car sharing, travelling to closer locations, home-based vehicle maintenance and use of smaller and older (cheaper) second hand cars. Overall the study concluded that there were good mobility benefits associated with having a car on low income, however the impacts on affordability are concerning because FCO households clearly face financial stress.

The financial vulnerabilities associated with increased fuel prices and car affordability on the urban fringe have been the subject of a series of papers regarding Australian cities (Dodson et al. 2004; Dodson and Sipe 2006). A major concern has been that rising fuel prices act to increase pressure on low income household budgets. In addition many of these households are highly geared from a home loan mortgage viewpoint. The urban fringe of Australian cities, in particular, is extremely vulnerable to this combination of potential financial stressors. This again highlights the need to understand the current context of FCO households, particularly in the urban fringe.

This research paper revisits the scale and distribution of forced car ownership households using a time series analysis from the 2001, 2006 and 2011 census. The focus of the analysis is on low-income households with high car ownership (FCO households) in the urban fringe of Melbourne. It explores the geographic distribution of households and explores changes in FCO households between census years.

3. Research Method

FCO households are identified in this analysis based on low income (lowest quartile) and high car ownership (2 or more cars per household). Data were compiled for the 2001, 2006 and 2011 census years for Melbourne (Australian Bureau of Statistics 2001; Australian Bureau of Statistics 2006; Australian Bureau of Statistics 2011). In each case households were classified based on household vehicle ownership, geographic location and income. Concordance tables provided by the Australian Bureau of Statistics were used to compare geographic locations between years. Maps are presented either at the SA1 or SA2 geographic level, as specified. Data tables are geographically aggregated upward into inner, middle and outer Melbourne regions based on local government areas¹ to explore patterns of changes between regions.

Households were categorised into 'low' or 'high' income groups based on the lowest quartile threshold. The absolute value of this cut-off point varied by census year as follows:

- 2001 - \$499 per week
- 2006 - \$649 per week
- 2011 - \$799 per week

¹ Inner local government areas included Melbourne, Yarra, Stonnington and Port Phillip; middle local government areas included Hobsons Bay, Maribyrnong, Brimbank, Moonee Valley, Moreland, Darebin, Banyule, Manningham, Boroondara, Whitehorse, Monash, Glen Eira, Bayside, Kingston and Greater Dandenong; outer areas included Wyndham, Melton, Hume, Whittlesea, Nillumbik, Yarra Ranges, Maroondah, Knox, Cardinia, Casey, Frankston and Mornington Peninsula.

4. Results

Table 1 shows the distribution of Melbourne households by car ownership and income for Outer Melbourne in 2001, 2006 and 2011.

Table 1: Melbourne households by car ownership, income and geographic location in 2001, 2006 and 2011

2011						
Region	Income	No vehicles	1 vehicle	2 vehicles	2+ vehicles	Total
Outer Melbourne	Low income	18,684 (13%)	80,700 (56%)	33,620 (23%)	40,116 (28%)	145,208
	High income	3,978 (1%)	73,834 (21%)	179,235 (50%)	273,881 (77%)	356,092
	Total	25,201 (4%)	169,430 (27%)	233,737 (37%)	350,554 (55%)	638,741
Total Melbourne	Low income	85,201 (22%)	201,055 (52%)	71,515 (18%)	83,769 (22%)	386,632
	High income	36,848 (4%)	263,131 (29%)	411,309 (45%)	593,689 (66%)	904,576
	Total	134,890 (8%)	506,683 (31%)	531,465 (32%)	758,945 (46%)	1,638,629
2006						
Region	Income	No vehicles	1 vehicle	2 vehicles	2+ vehicles	Total
Outer Melbourne	Low income	18,138 (15%)	68,028 (55%)	26,468 (21%)	31,990 (26%)	123,266
	High income	2,567 (1%)	64,281 (21%)	155,390 (51%)	232,632 (76%)	304,934
	Total	23,113 (4%)	146,529 (27%)	201,628 (37%)	298,525 (54%)	552,272
Total Melbourne	Low income	84,863 (24%)	179,896 (51%)	59,597 (17%)	70,522 (20%)	352,192
	High income	30,281 (4%)	236,302 (29%)	373,931 (46%)	528,833 (65%)	810,460
	Total	128,095 (9%)	457,228 (31%)	481,472 (32%)	677,942 (45%)	1,493,133
2001						
Region	Income	No vehicles	1 vehicle	2 vehicles	2+ vehicles	Total
Outer Melbourne	Low income	16,357 (17%)	54,938 (57%)	17,544 (13%)	20,831 (22%)	96,570
	High income	4,577 (2%)	65,750 (24%)	143,083 (45%)	203,653 (73%)	279,274
	Total	23,700 (5%)	134,973 (31%)	179,203 (34%)	255,387 (59%)	436,156
Total Melbourne	Low income	75,150 (25%)	154,062 (52%)	41,279 (18%)	49,325 (17%)	296,432
	High income	30,183 (4%)	235,886 (31%)	352,041 (51%)	486,368 (63%)	769,720
	Total	118,205 (10%)	431,963 (35%)	439,602 (41%)	610,487 (49%)	1,243,690

Note: totals include households where income or car ownership is not stated. Percentages are given across row totals.

Low-income households with 2 or more cars (FCO households) are highlighted in bold and percentages shown are across rows. This indicates that:

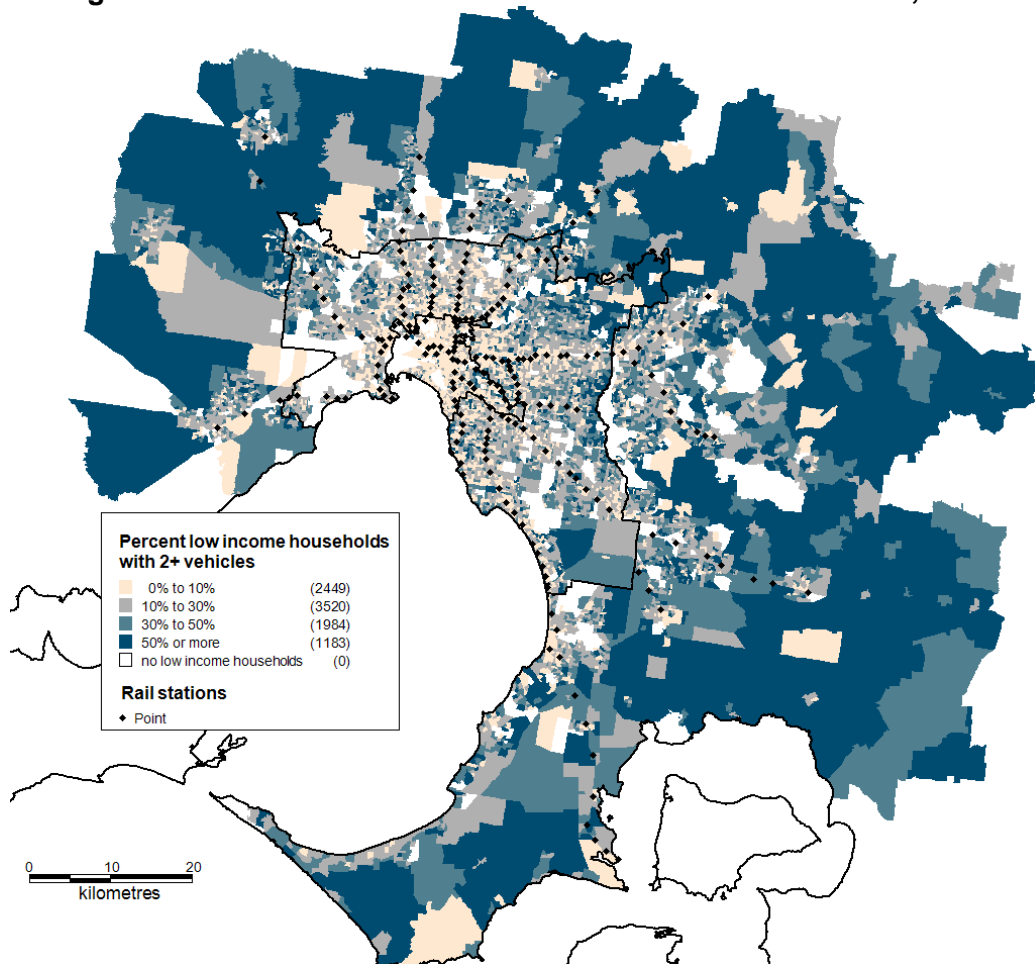
- Households that can be classified as having Forced Car Ownership (2 or more cars at low income) in Outer Melbourne have increased considerably in scale
 - From 20,831 in 2001 to 31,990 in 2006 and 40,116 in 2011
- For Melbourne as a whole FCO households have also increased:
 - From 49,325 in 2001 to 70,522 in 2006 and 83,769 in 2011
- FCO households as a proportion of all low-income households increased steadily between census years

- In outer Melbourne, from 22% of low-income households in 2001 to 26% in 2006 and 28% in 2011
- In all of Melbourne, from 17% in 2001 to 20% in 2006 to 22% in 2011
- In 2001, 42% of FCO households were located in fringe areas. This steadily increased to 45% in 2006 and 48% by 2011.

Overall FCO households in outer Melbourne have grown by some 19,285 between 2001 and 2011, an increase of 93%.

Figure 1 maps the percent of low-income households with 2+ vehicles (as a proportion of all low-income households) in Melbourne, based on the 2011 census. This map echoes Table 1 in demonstrating that low-income households farther from the city centre are more likely to own 2+ cars. Furthermore, it illustrates that the presence of public transport (in this case, proximity to rail stations) partially counteracts the effects of living farther from the city centre.

Figure 1: Percent of low-income households with 2+ vehicles, 2011



Note: Black lines inside Melbourne boundary designate inner, middle and outer Melbourne. Data presented at the census SA1 level.

Table 2 shows the absolute and relative percentage change in households in car ownership classes between census years.

Table 2: Change in Melbourne households by car ownership, income and geographic location between 2006-2011 and 2001-2011

DIFFERENCE 2006-2011 (% CHANGE 2006-2011)						
Region	Income	No vehicles	1 vehicle	2 vehicles	2+ vehicles	Total
Inner Melbourne	Low income	1,831 (11%)	1,979 (16%)	694 (48%)	603 (34%)	4,446 (14%)
	High income	2,726 (20%)	6,388 (15%)	1,648 (6%)	3,322 (11%)	11,954 (13%)
	Total	4,851 (15%)	9,201 (15%)	2,509 (8%)	4,299 (12%)	16,903 (10%)
Middle Melbourne	Low income	-1,966 (-4%)	6,097 (6%)	3,840 (13%)	4,130 (12%)	7,307 (4%)
	High income	2,442 (18%)	10,730 (8%)	11,460 (6%)	18,896 (7%)	29,459 (7%)
	Total	-10 (0%)	16,752 (7%)	14,705 (6%)	22,606 (7%)	39,203 (5%)
Outer Melbourne	Low income	546 (3%)	12,672 (19%)	7,152 (27%)	8,126 (25%)	21,942 (18%)
	High income	1,411 (55%)	9,553 (15%)	23,845 (15%)	41,249 (18%)	51,158 (17%)
	Total	2,088 (9%)	22,901 (16%)	32,109 (16%)	52,029 (17%)	86,469 (16%)
Total	Low income	338 (0%)	21,159 (12%)	11,918 (20%)	13,247 (19%)	34,440 (10%)
	High income	6,567 (22%)	26,829 (11%)	37,378 (10%)	64,856 (12%)	94,116 (12%)
	Total	6,795 (5%)	49,455 (11%)	49,993 (10%)	81,003 (12%)	145,496 (10%)
DIFFERENCE 2001-2011 (% CHANGE 2001-2011)						
Region	Income	No vehicles	1 vehicle	2 vehicles	2+ vehicles	Total
Inner Melbourne	Low income	4,790 (37%)	3,194 (29%)	517 (32%)	276 (13%)	7,523 (26%)
	High income	6,394 (63%)	11,384 (30%)	3,496 (14%)	3,845 (13%)	20,195 (25%)
	Total	12,138 (46%)	15,714 (29%)	4,670 (16%)	4,927 (13%)	53,616 (40%)
Middle Melbourne	Low income	2,557 (6%)	15,623 (18%)	12,335 (56%)	13,132 (50%)	29,335 (17%)
	High income	825 (5%)	5,777 (4%)	13,161 (7%)	22,112 (9%)	24,553 (6%)
	Total	2,592 (4%)	19,647 (8%)	24,090 (10%)	33,780 (11%)	115,617 (17%)
Outer Melbourne	Low income	2,327 (14%)	25,762 (47%)	16,076 (92%)	19,285 (93%)	48,638 (50%)
	High income	-599 (-13%)	8,084 (12%)	36,152 (25%)	70,228 (34%)	76,818 (28%)
	Total	1,501 (6%)	34,457 (26%)	54,534 (30%)	95,167 (37%)	202,585 (46%)
Total	Low income	10,051 (13%)	46,993 (31%)	30,236 (73%)	34,444 (70%)	90,200 (30%)
	High income	6,665 (22%)	27,245 (12%)	59,268 (17%)	107,321 (22%)	134,856 (18%)
	Total	16,685 (14%)	74,720 (17%)	91,863 (21%)	148,458 (24%)	394,939 (32%)

Note: Totals include households where income or car ownership is not stated. Percentages represent change in population group between census years.

Over time low-income households have disproportionately settled in outer Melbourne, adding over 48,000 households since 2001. In particular, the proportion of low-income

households with 2+ vehicles has increased significantly, adding over 34,000 households across all of Melbourne since 2001. Most of these 2+ car households (over 19,000) have settled in outer Melbourne.

Figure 2 maps out the change in *all* low-income households between 2001 and 2011 in Melbourne². The highest growth rates have occurred in outer western, northern and south-eastern Melbourne. This is a result of a rapid increase in greenfield housing estates in these areas. In addition there has been an increase in low-income households in inner Melbourne although the absolute number of new residents in these areas is smaller (i.e., 7,523 new low-income residents in inner Melbourne compared to 48,638 in outer Melbourne, see Table 2). Many areas of middle Melbourne, especially near train lines, have actually reduced the number of low-income households.

Figure 2: Change in low-income households, 2001-2011

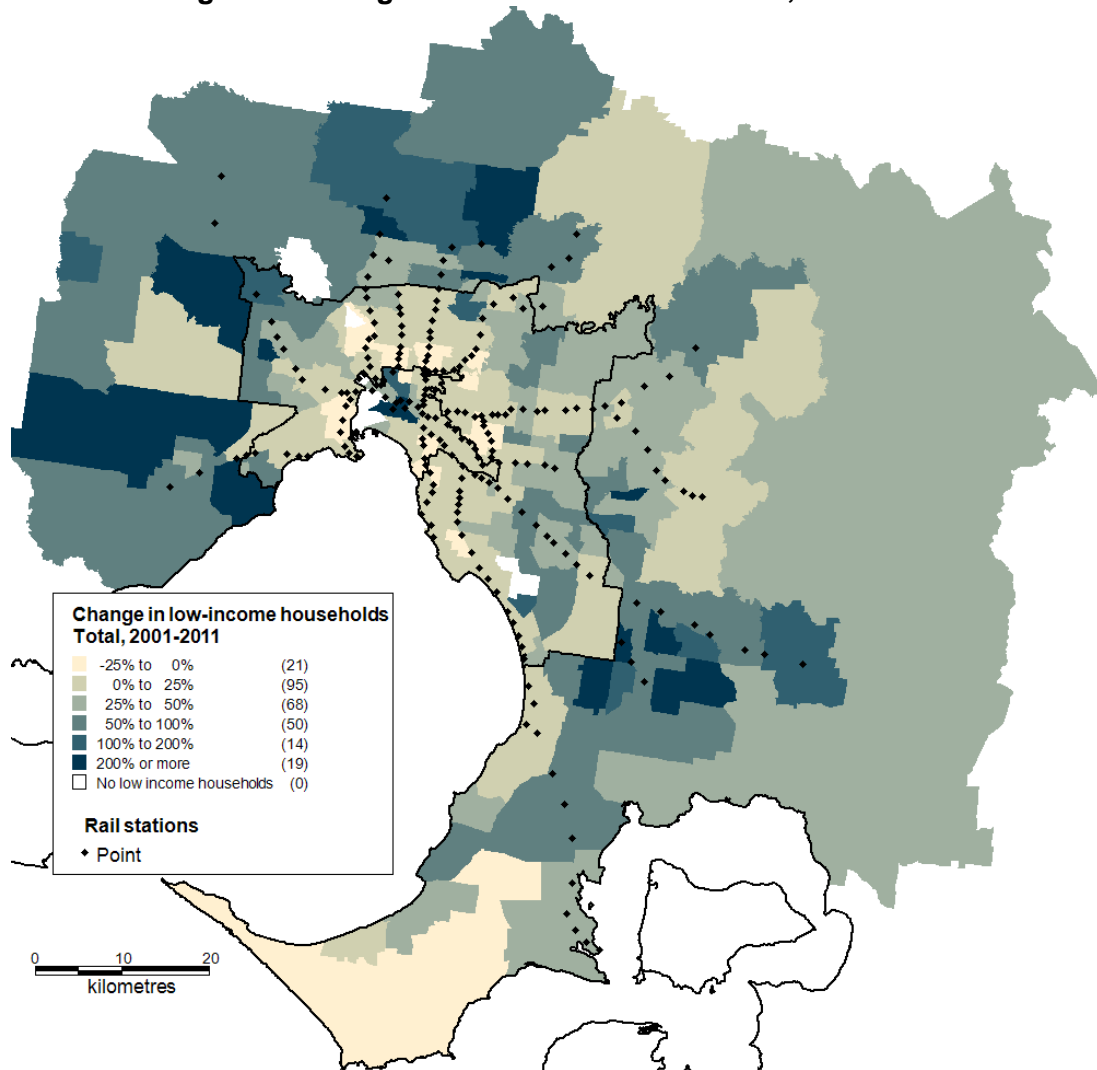
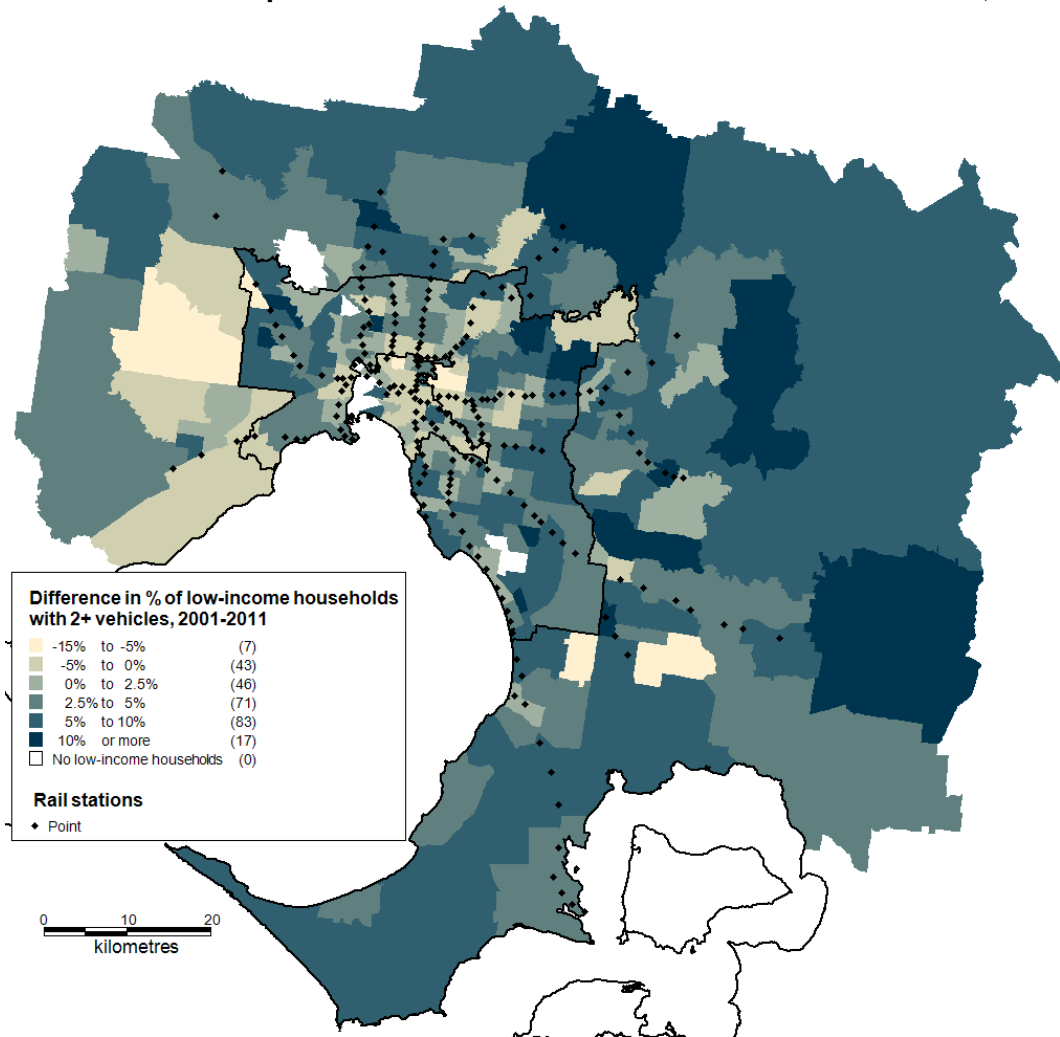


Figure 3 presents the change 2001-2011 of low-income households with 2+ cars as a proportion of all households. With some exceptions, the largest increases in proportion of 2+ households occurred in outer suburban areas. Reductions in the percent of FCO households tended to occur in inner areas.

² Data was aggregated up from SA1 to SA2 geographic zones to improve concordance between 2001 and 2011 data.

Figure 3: Difference in percent of low-income households with 2+ vehicles, 2001-2011



Note: Black lines inside Melbourne boundary designate inner, middle and outer Melbourne. Data presented at the census SA2 level.

5. Discussion and implications

This research paper has explored trends in the number and distribution of low-income households with high car ownership ('Forced Car Ownership' or FCO) in Melbourne between 2001 and 2011. The analysis has shown a 93% increase in FCO households in outer Melbourne between 2001 and 2011. Most increases have been in areas with poor access to public transport or walk accessibility alternatives. The highest growth rates in low-income households have occurred in outer western, northern and south-eastern fringe and middle Melbourne. This is a result of a rapid increase in greenfield housing estates in these areas. Not only are there more low-income households locating in outer Melbourne than ever before, but a larger proportion of those households own 2 or more cars (28% in 2011 compared to 22% in 2001).

The most pressing policy implication of these numbers is the concerns it raises for the vulnerability of low income Melbourne residents to financial shocks associated with potential future increases in fuel prices. In 2001, just over 20,000 households were identified as a concern; this has almost doubled in scale in 10 years. Whilst there have been some positive

investments in fringe area public transport services during this time, current policy has almost abandoned development of bus services in fringe Melbourne despite the considerable population growth in the recent past. A growth that is projected to continue in the near future. The obvious implication of this analysis is that fringe Melbourne is facing a potential transport poverty crisis.

The role of land use policy in these trends is clearly important. Population expansion on the urban fringe remains the paradigm despite policies that recommend containment of sprawl. Whilst there has been some significant population growth in accessible inner areas, the scale of growth for low-income households is small (an additional 7,523 households) compared to growth in outer areas (an additional 48,638 households). Clearly fringe population growth has still dominated in inaccessible and car dependent contexts.

The findings suggest a number of important areas for future research. It is important to establish how transport affordability has changed for these households over this period. There is some evidence that car affordability has improved but it is not clear whether these improvements are experienced by FCO households. It is also important to explore how low income groups would cope with possible future shocks in transport affordability since this is the major concern for policy.

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