

Parking Limitation Policies: The Influence of Car Parking Provision on Travel Modes

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ABSTRACT

The application and development of parking standards must continue to evolve as planning and transportation policies embody ‘sustainability’ and ‘accessibility’ principles and road network congestion increases.

At the planning stage the argument can be formed that restricting the provision of car parking will naturally reduce the level of private vehicle (car) travel.

Is this view however too simplistic? Does the provision of car parking actually have that much influence over the way in which we travel? Are other factors; road congestion; availability of alternate transport options, more influential to how we travel and the likelihood of us using alternate modes?

This paper will investigate ABS and VISTA data (and other available data), literature review and recent development case studies to consider:

- The changing car ownership trends
- The changing travel mode (journey to work) trends
- The relationship between car ownership and journey to work
- Whether such relationship varies by location, in particular with different levels of traffic congestion and accessibility to public transport.

The decoupling of car ownership and usership is an important link which must be understood to be able to effectively plan development, and understand its implications to parking and transport networks.

1. Introduction

Car parking indisputably plays a key role in modern transport systems, facilitating the use of private motor vehicles. But to what extent does its provision and pricing influence how we travel?

Policies which seek to reduce the provision of car parking spaces, such as through specifying a statutory maximum rate for its provision (as opposed to statutory minimums), generally have at their heart an assumption that this will decrease car travel where it is desirable to do so. The intent of such policies may be to prevent increased car traffic from worsening congestion, or to increase the relative attractiveness of other transport modes, such as walking, cycling and public transport.

This paper explores this assumption to investigate whether the implied causal relationship between car parking provision and increased vehicle use is justified or overly simplistic. It is important to interrogate this assumption as it underpins parking policies which may then be unreasonably inflexible or fail to deliver optimal outcomes for land use and transport systems.

2. Evolution of Parking Controls

Recently, an evolution has been occurring in the definition of development car parking requirements in various Australian jurisdictions.

Traditionally, car parking policy has dictated the minimum amount of parking to be provided in association with developments and changes of land use. In most instances, minimum rates of provision continue to set the benchmark of planning controls. However, in some contexts, such as key activity centres which experience constrained road networks, parking policies instead setting maximum rates (parking limitation policies) have become prevalent.

Melbourne City Council initiated its introduction toward maximisation policies within the Capital City Zone in 1999. While the local policy at the time did not specifically identify maximum rates the policy indicated:

[...] the supply of car parking in the CBD must be more carefully managed to control traffic congestion, optimise pedestrian safety and mitigate adverse impacts to the environment."

"Patterns of visitation to the City have also been changing, requiring an emphasis on meeting short-term visitor needs and the special requirements of the retail core and of major sporting, cultural and recreational events. The responsible authority can respond to these needs by ensuring an appropriate supply of convenient and well-priced short-stay parking, while discouraging unnecessary commuter car travel.

Further evolutions of this policy have gone on to include the use of maximum rates for commercial and residential uses, and in areas outside of the CBD. Similar limitation policies have been introduced in key New South Wales and Queensland central business districts.

In a further evolution of parking policies, the Australian Capital Territory has moved from requiring a minimum amount of parking provision to 'no minimum' requirement for residential uses within Commercial Zone 1 (CZ1) and Commercial Zone 2 (CZ2) zones in City and town centres. The policy identifies that:

...residents in major centres have access to a high level of services and amenities, including access to public transport, and the role of cycling and walking as significant alternative transport modes.

This approach, which allows reduced car parking provisions, recognises changing travel patterns within our country's capital and the desire to encourage sustainable travel, particularly within city and town centre commercial zones. The adoption of a 'no minimum' approach, however, represents a unique position in allowing the market to dictate the level of car parking to be provided, potentially resulting in any outcome between very low car parking provision and higher parking provisions which might encourage private car use.

3. Importance of Getting Parking Controls and Provisions Right

As outlined in Coath (2011), the development and application of parking standards must continue to evolve in line with the aspirations of transportation policies, in regards to principles such as 'sustainability' and 'accessibility'.

While concepts such as 'liveability' and 'accessibility' can be defined in many ways, the following objectives represent some principles relating to planning policy that might be considered largely uncontroversial. Parking interacts with each of these principles, as detailed below.

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- Providing an affordable community:
Parking represents a cost to developers which is ultimately passed onto the community. As such parking should be carefully considered to ensure any overprovision is minimised.
 - Providing an environment that is equitable to all:
Parking (particularly free parking) does not provide an equitable environment with costs and delays caused by car parking are experienced by those not using parking facilities.
 - To appropriately protect the amenity of those within the community:
Parking provides an improved amenity for those driving to a destination making its provision of commercial importance in attracting customers
Parking overspill can create a reduced amenity in residential areas however such a reduced amenity must be balanced against the benefits of proximate living to an activity centre.
 - Providing an urban design which enhances the community:
Parking detracts from the urban design of a community
 - Provides a range of services to meet the needs of the community:
The space requirements of parking can limit the effective provision of a range of services.

It is apparent that we as Australians live in a car based society and the provision of car parking is inevitable. However, parking can also represent a burden to the way we live and our communities operate.

The factors detailed above highlight that car parking must be considered in a balanced manner to contribute to the liveability and accessibility of communities both today and into the future. As such, parking facilities and policies regarding their provision must be carefully managed to minimise the negative aspects of car parking.

4. Examination of Car Ownership and Car Use Relationships

The relationship between car parking provision, car ownership and car use needs to be understood in order to identify whether the appropriate parking policy tool to achieve transport system, liveability and accessibility aspirations involves minimum, maximum or indeed no car parking requirements.

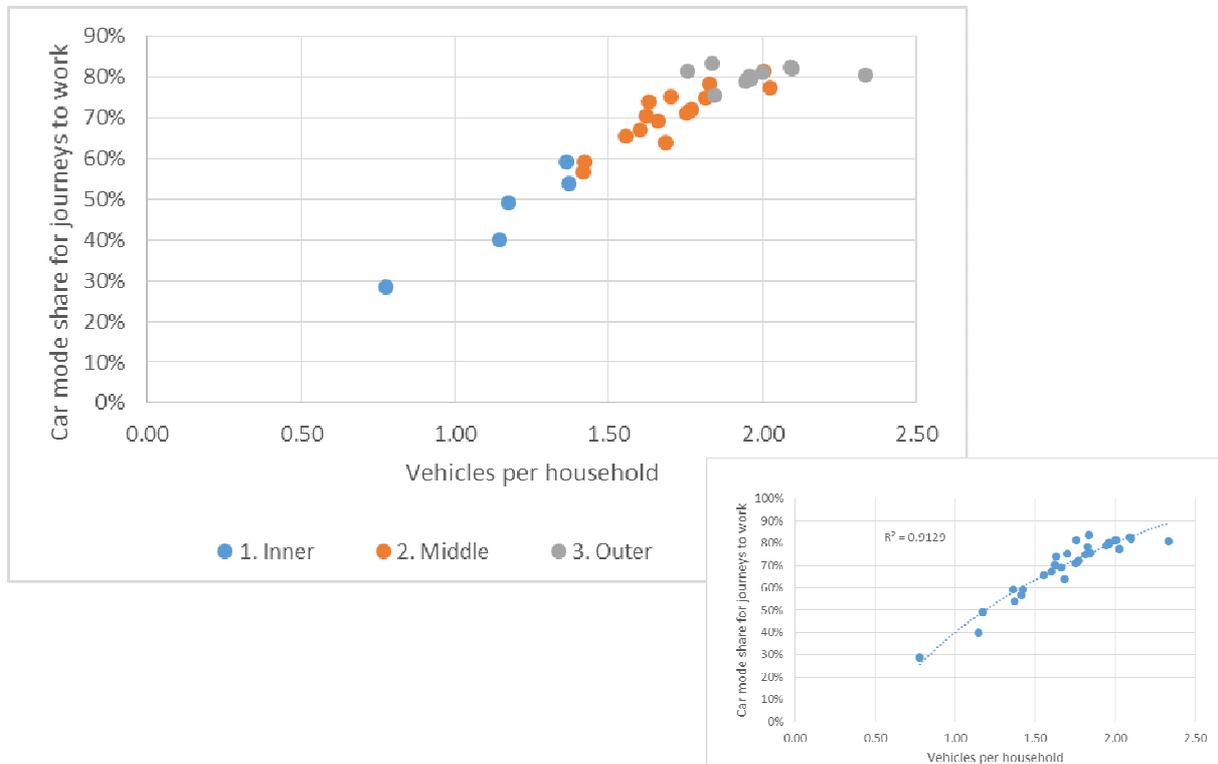
Policies which seek to reduce the provision of car parking spaces, such as through specifying a statutory maximum rate for its provision are generally predicated on the assumption that this will decrease car travel. These policies are often enacted to achieve policy aims such as reducing traffic congestion or encouraging alternative modes of transport.

In interrogating this key assumption of such policies, it is necessary to determine whether there is a causal relationship between rates of car ownership and rates of car travel. On the face of it, this seems like an easy enough proposition to test. The Australian Census collects data on both vehicle ownership and mode of transport to work. Although data on transport mode for other destinations is not collected, this is nevertheless useful as a starting point, as many journeys to work occur during peak periods (by definition).

4.1 Household Car Ownership v Car Mode Share

Figure 1 shows the relationship between rates of household vehicle ownership and the proportion of journeys to work made by car, for each of Melbourne's 31 municipalities (grouped into Inner, Middle and Outer Rings). There is a strong positive relationship between these two variables ($R^2 = 0.91$).

Figure 1: Car Ownership (veh per household) v Car Mode Share



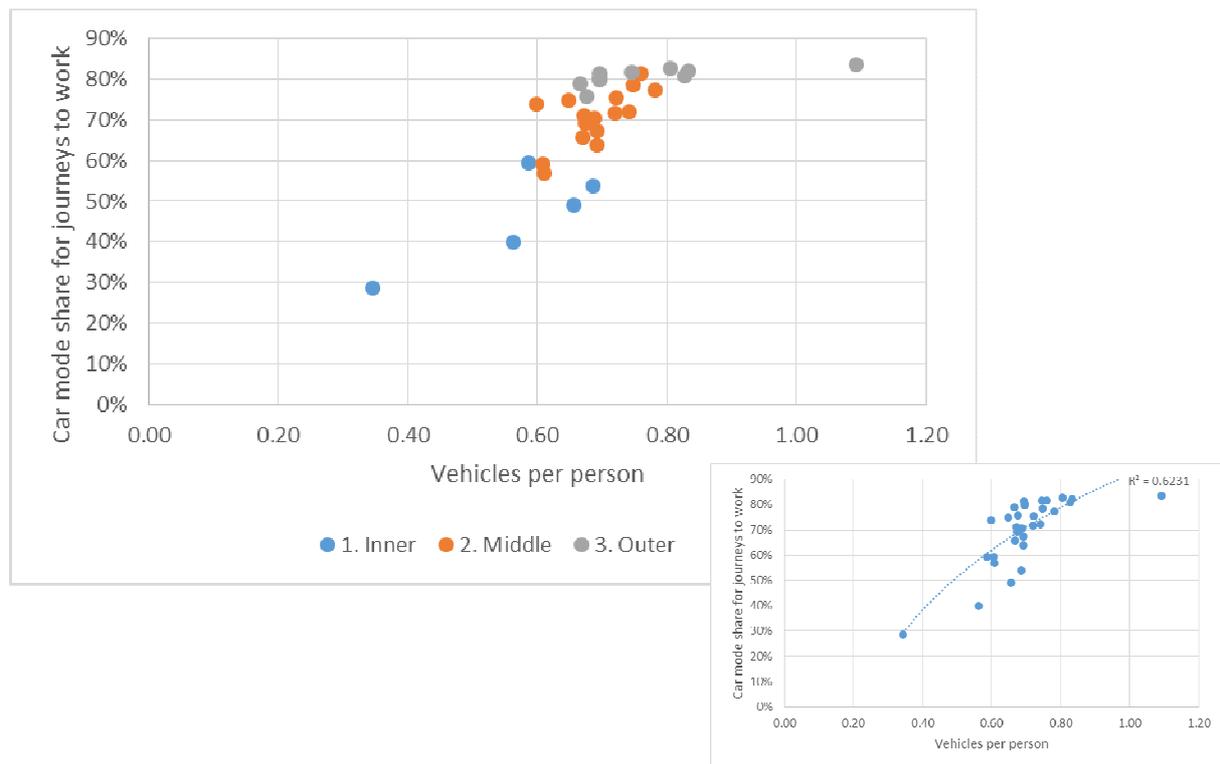
However, correlation does not imply causation. While it is true that locations with higher car ownership have higher levels of car travel, these locations also differ on important variables such as ease of car travel (e.g. lower levels of congestion), public transport supply, average trip distances, and conditions conducive to walking and cycling. This is shown in part in the above graph by the generally neat grouping of inner, middle and outer ring municipalities on the continuum of both variables. For example, the City of Melbourne has lower rates of vehicle ownership and car travel than the City of Nillumbik, but it also has vastly superior public transport options and shorter trip distances.

That the relationship between car ownership and car mode share should not be taken as causal - at least that the former should not be assumed to be determinative of the latter - can be seen by controlling for a single variable, that of household size.

4.2 Person Car Ownership v Car Mode Share

Figure 2 below shows the relationship between car ownership per person (as opposed to for households) and car mode share for journeys to work.

Figure 2: Car Ownership (veh per person) v Car Mode Share

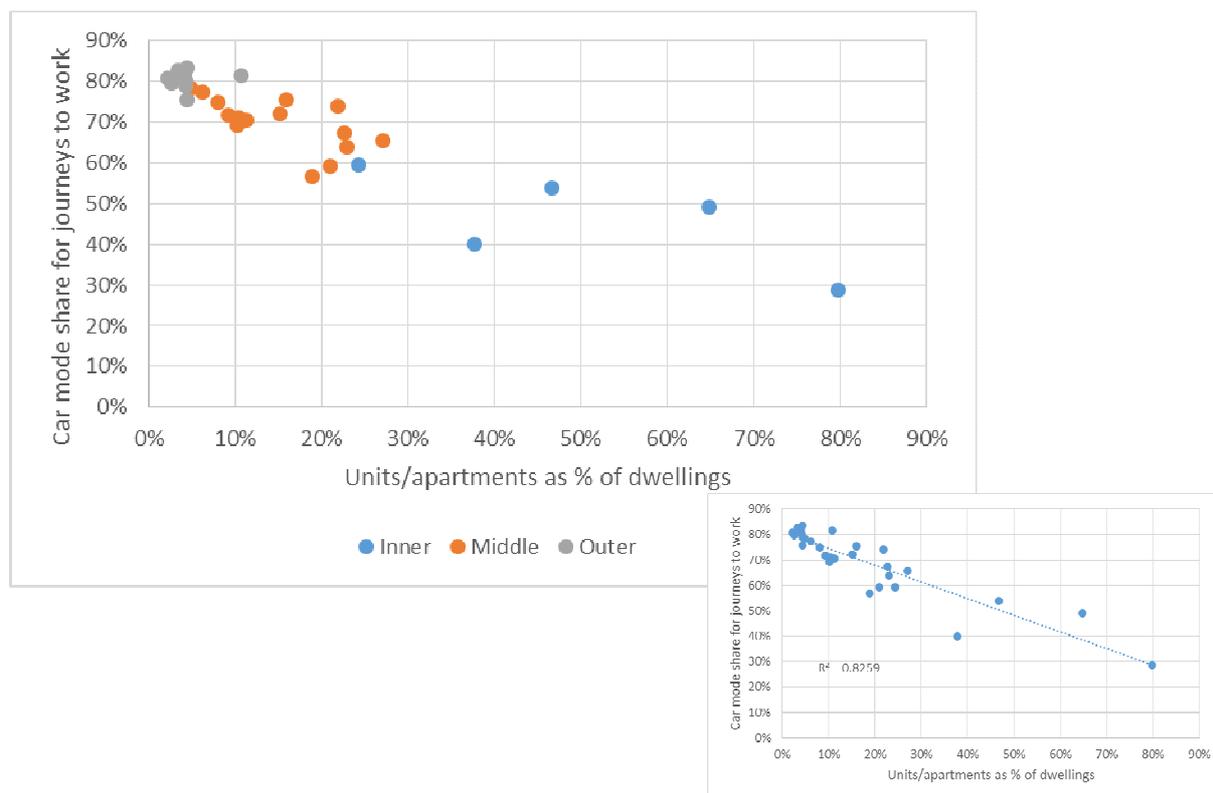


While a positive relationship still exists, it is much weaker ($R^2 = 0.55$). It is possible that this relationship is weaker than that shown in the first graph because lower density municipalities further from the city centre also have larger household sizes which, all other things being equal, will have higher household vehicle ownership rates. This begins to show that it is likely that a number of factors which correlate with vehicle ownership may also play a role in determining car mode share.

4.3 Dwelling Type v Car Mode Share

A strong relationship also exists between built form characteristics and car travel. Figure 3 demonstrates that Municipalities with a higher proportion of higher density housing (units and apartments) have lower rates of car travel to work.

Figure 3: Units/Apartments as % of dwellings v Car Mode Share



Again, this relationship is unlikely to be directly causal, as higher densities are also associated with shorter trip distances and more opportunities to travel by modes other than the car. Nevertheless, it demonstrates that rates of car travel are not simple functions of car ownership but can be seen to be determined by a range of often inter-related factors.

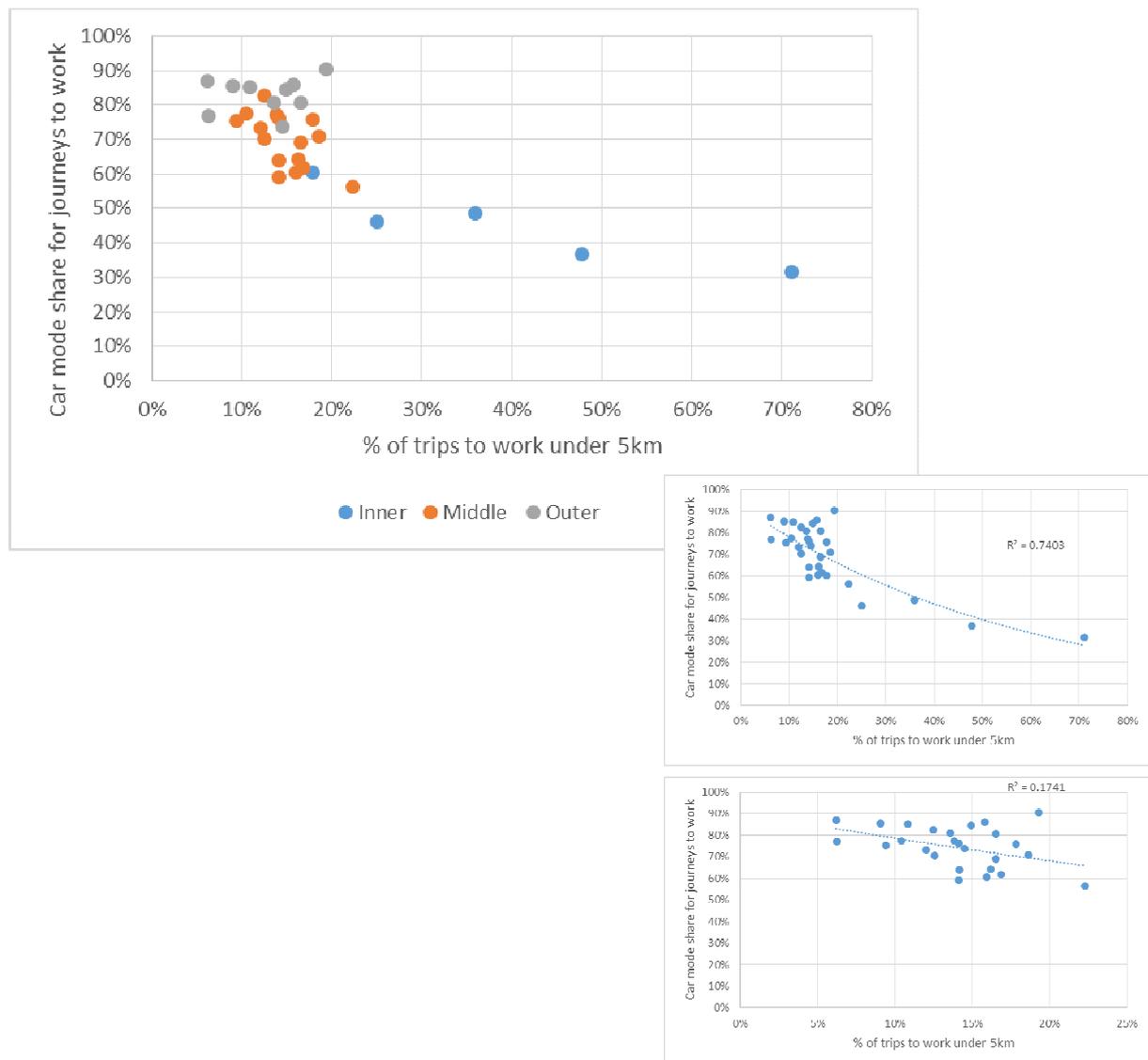
4.4 Trip Distance v Car Mode Share

Another factor that can be shown to be significantly related to car mode share for journeys to work is trip distance. While the Census does not collect information on the latter, both factors are surveyed in the Victorian Integrated Survey of Travel and Activity (VISTA).¹

Figure 4 shows that there is a strong negative relationship ($R^2 = 0.74$) between the proportion of trips to work in each municipality that are under 5km, and car mode share for trips to work. Interestingly, the relationship is weaker ($R^2=0.17$) when looking only at middle and outer ring municipalities, suggesting that in these areas where most work trips are above 5km, rates of car travel are determined by other factors (such as public transport quality), rather than small variations in proportions of trips to work over a short distance.

¹ VISTA is a survey of the sample of the population (as opposed to the Census, which records information on over 99% of the Australian population), and as such its results must be interpreted with caution, particularly with regard to detailed queries (such as at sub-municipal spatial categories) where a small number of responses are being compared, leading to significant statistical error. For this reason, VISTA data is only used here at the LGA (municipal) scale and in relation to the proportion of trips taken by car (which is higher than for other modes, and as such has lower random error). For further reliability, factors surveyed in VISTA are compared only against other VISTA data (as opposed to against comparable statistics from the Census).

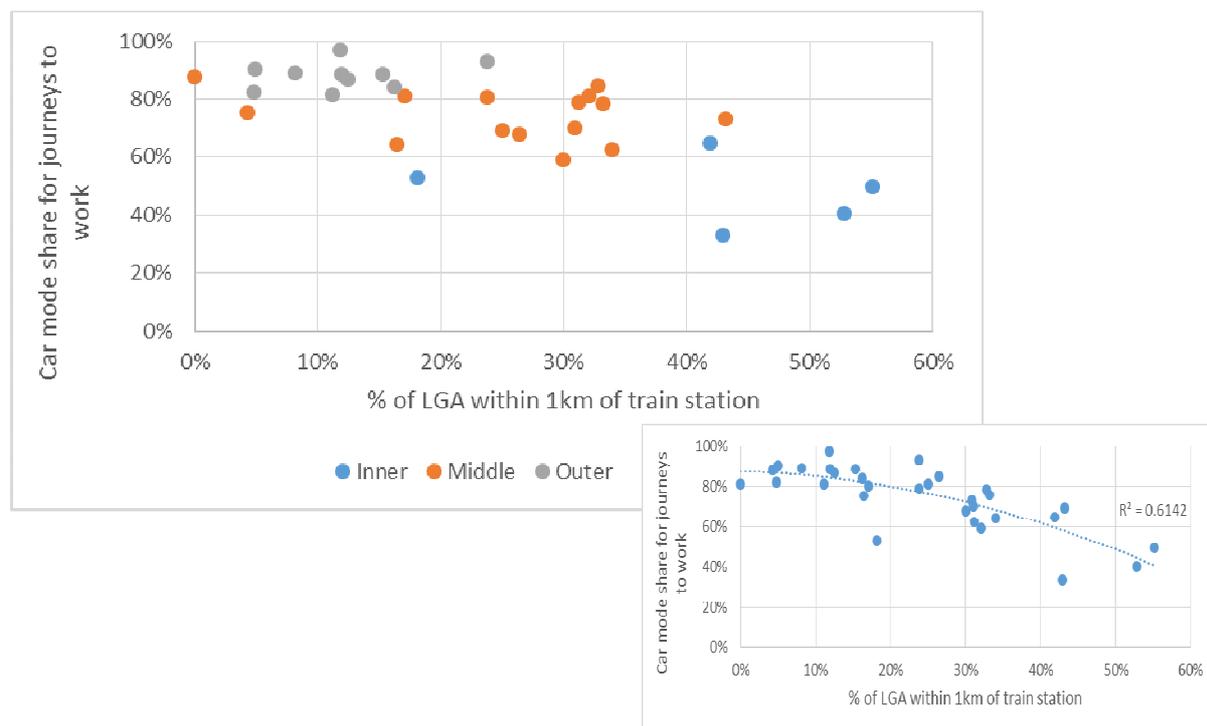
Figure 4: Percent of Trips to work under 5km v Car Mode Share



4.5 Distance to Train Station v Car Mode Share

A relationship also exists ($R^2 = 0.58$) between the proportion of each municipality's population located within a walkable distance of a train station and car mode share for journeys to work. This is shown in Figure 5.

Figure 5: % of LGA within 1km of train station v Car Mode Share



However, this relationship is weaker than others previously shown, and there is also a weaker relationship between the former variable and whether a municipality is in the inner, middle or outer ring. This is likely due to the fact that this variable excludes other forms of public transport, such as trams, which play a significant role in the inner and middle suburbs. The presence of a train station is also not necessarily a reliable indicator of public transport quality, as stations differ in service frequency and connectivity to other services. For example, train stations closer to the city may have greater service frequencies due to being served by multiple lines, and are more likely to be or be located closer to major interchanges.

4.6 Summary

From this analysis of ABS Census and VISTA data, it is clear that a relationship does exist between car ownership and car use. However, from other strong relationships identified in this section, it is clear that a range of inter-related factors are in play. This paper does not propose to determine the relative magnitude of these factors as determinants.

While it is true that locations with higher car ownership have higher levels of car travel, these locations also differ on important variables such as ease of car travel (e.g. lower levels of congestion), public transport supply, average trip distances, and conditions conducive to walking and cycling.

5. Other Research

To supplement the data sources examined above consideration has also been given to some other available research on the topic.

5.1 Research into the Use and Effectiveness of Maximum Parking Standards (June 2008)

The Department for Transport (England) commissioned Atkins, under the Framework for Transport Related Technical Advice and Research, to undertake a review of existing research relating to the maximum standards for non-residential car parking, as currently set out in Planning Policy Guidance 13: Transport (PPG13), as well as investigating the effects of these parking standards on traffic levels and economic development.

The study highlighted several common themes including:

- Parking is a very important demand management tool;
- Developers see parking as important as they consider that it adds value to their asset; and
- There is no evidence to suggest that parking standards have a significant negative impact on economic development within urban and rural areas.

Additionally, the research found no indication that maximum parking standards have had any effect upon inward investment or economic development. Indeed, some evidence suggested that maximum parking standards would support business and the economy within urban and rural areas.

5.2 Does Car Ownership Increase Use (2011)

The Berkeley Group commissioned WSP to prepare a study which considered the use of car parking within residential schemes in London.

The aim of the study was to provide a better understanding of the relationship between car ownership and car use, particularly in light of the Mayor's stated desire to adopt a more balanced approach to car parking and the Coalition Government's abolition of national maximum car parking standards.

Findings of the research found that there is no relationship between car ownership and peak hour car use. Daily trip profiles highlighted from development surveys showed consistently low levels of car use throughout the day.

It appeared that many residents who own cars decide not to use them for peak hour travel and will instead walk, cycle or use public transport.

This supports objectives behind planning policy which seeks to ensure residents have access to a range of sustainable transport choices available in the places where they live.

Overall, the study confirmed that residential traffic is not sensitive to car ownership or parking levels. Whilst many residents wish to own a car, they do not use one for peak hour travel and overall use throughout the day remains low. Therefore, the application of car parking policies within the London Plan 2011 should allow parking provision to be agreed at a level which supports the viability of new developments, alongside the delivery of sustainable transport initiatives.

5.3 Land Use Impacts on Transport (2015)

Litman (2015) investigated how various land use factors affect transport outcomes, and the ability of smart growth (also called new urbanism or compact development) policies to achieve various planning objectives.

Although most land use factors have modest individual impacts, typically affecting just a few percent

of total travel, they are cumulative and synergistic. Integrated smart growth programs that result in community design similar to what developed prior to 1950 can reduce vehicle ownership and travel by 20-40%, and significantly increase walking, cycling and public transit, with even larger impacts if integrated with other policy changes such as increased investments in alternative modes and more efficient transport pricing.

Care is needed when evaluating the impacts of specific land use factors. Impacts vary depending on definitions, geographic and time scale of analysis, perspectives and specific conditions, such as area demographics.

Most factors only apply to subset of total travel, such as local errands or commuter travel. Density tends to receive the greatest attention, although alone its travel impacts are modest. Density is usually associated with other factors (regional accessibility, mix, transport system diversity, parking management) that together have large travel impacts. It is therefore important to make a distinction between the narrow definition of density as an isolated attribute, and the broader definition (often called compact development) that includes other associated attributes.

A key question is the degree of consumer demand for more accessible, multi-modal development. Demographic and economic trends (ageing population, rising fuel prices, increasing health and environmental concerns, changing consumer location preferences, etc.) tend to increase demand for more accessible, multi-modal locations. This suggests that smart growth policies are likely to have greater impacts and benefits in the future

Table 1 summarises the effects of land use factors on travel behaviour.

Table 1: Land Use Impacts on Travel

Factor	Definition	Travel Impacts
Regional accessibility	Location of development relative to regional urban center.	Reduces per capita vehicle mileage. Central area residents typically drive 10-30% less than at the urban fringe
Density	People or jobs per unit of land area (acre or hectare).	Reduces vehicle ownership and travel, and increases use of alternative modes. A 10% increase typically reduces VMT 0.5-1% as an isolated factor, and 1-4% including associated factors (regional accessibility, mix, etc.).
Mix	Proximity between different land uses (housing, commercial, institutional)	Tends to reduce vehicle travel and increase use of alternative modes, particularly walking. Mixed-use areas typically have 5-15% less vehicle travel.
Centeredness (centricity)	Portion of jobs in commercial centers (e.g., central business districts and town centers)	Increases use of alternative modes. Typically, 30-60% of commuters to major commercial centers use alternative modes compared with 5-15% at dispersed locations
Network Connectivity	Degree that walkways and roads are connected	Increased roadway connectivity can reduce vehicle travel and improved walkway connectivity increases non-motorized travel
Roadway design	Scale, design and management of streets	Multi-modal streets increase use of alternative modes. Traffic calming reduces VMT and increases non-motorized travel
Active	Quantity, quality and security	Improved walking and cycling conditions tends to increase

transport (walking and cycling)	of sidewalks, crosswalks, paths, and bike lanes.	nonmotorized travel and reduce automobile travel. Residents of more walkable communities typically walk 2-4 times more and drive 5-15% less than in automobile-dependent areas.
Transit quality and accessibility	Quality of transit service and whether neighborhoods are considered transit-oriented development (TOD)	Increases ridership and reduces automobile trips. Residents of transit oriented developments tend to own 20-60% fewer vehicles, drive 20-40% fewer miles, and use alternative modes 2-10 times more than in automobile-oriented areas.
Parking supply and management	Number of parking spaces per building unit or acre, and how parking is managed and priced	Tends to reduce vehicle ownership and use, and increase use of alternative modes. Cost-recovery pricing (users finance parking facilities) typically reduces automobile trips 10-30%.
Site design	Whether oriented for auto or multi-modal accessibility	More multi-modal site design can reduce automobile trips, particularly if implemented with improvements to other modes.
Mobility management	Strategies that encourage more efficient travel activity	Tends to reduce vehicle ownership and use, and increase use of alternative modes. Impacts vary depending on specific factors.
Integrated smart growth programs	Travel impacts of integrated programs that include a variety of land use management strategies	Reduces vehicle ownership and use, and increases alternative mode use. Smart growth community residents typically own 10-30% fewer vehicles, drive 20-40% less, and use alternative mode 2-10 times more than in automobile-dependent locations, and larger reductions are possible if integrated with improved regional transit and more efficient transport pricing.

Table 1 indicates that while parking provision or ownership is a factor in the relationship of car use, it is only one of many factors that must be considered.

5.4 From Minimum to Maximum: Impact of the London Parking Reform on Residential Parking Supply from 2004 to 2010? (August 2012)

This study examined the impact of the London parking reform on off-street parking supply in new residential developments.

By way of a simple summary the study addressed two key questions:

Question 1: Does the minimum standard oversupply parking at all and if 'yes' will eliminating it reduce the excessive parking?

Yes, the minimum standard in London indeed forced developers to oversupply parking and, when it was removed, supply reduced by approximately 40 per cent.

Question 2: Is the maximum standard needed at all for an efficient parking market when the minimum standard is removed?

Yes, the maximum standard is still necessary for an efficient parking market because the deregulated parking market appears to provide more parking in the densest and transit-richest areas, and does not take into account the high social cost of driving and the opportunity cost of transit.

In summary, the London parking reform provided solid evidence to understand two parking policies

under heated debate: the minimum and maximum standards. The elimination of the minimum standard was highly effective in removing excessive parking, but still not enough to form an efficient parking market. The maximum standard could be a valuable supplement but without the effective control of on-street parking, its potential will be largely restrained. Efforts to co-ordinate on-street and off-street parking, such as car-free developments and controlled parking zones, might have improved the success of the parking reform and, if further developed, could well enhance the effectiveness of the new parking policies.

6. Minimum or Maximum

At the most simplistic level, the data collated within Section 4 of this paper indicates a trend does exist that as car ownership increases so does car usage.

While it is true that locations with higher car ownership have higher levels of car travel, these locations also differ on important variables such as ease of car travel (e.g. lower levels of congestion), public transport supply, average trip distances, and conditions conducive to walking and cycling. These relationships are also vitally important in influencing the way in which trips are made. Therefore, it may be unreasonable to rely on the restriction of car parking as being the only or even principal influence on reducing vehicle travel, particularly when balancing the needs of development viability.

Other research indicates a mixture of results including:

- There is no link between vehicle ownership and vehicle use.
- There is a link between vehicle ownership and vehicle use, however it is not the only relationship of influence to vehicle use.
- Maximum policies reduce car parking provision, however this particular study did not extend to consider whether ownership converts to use.

This mixture of results also points to supporting the findings identified in Section 4 that, while vehicle ownership influences vehicle use, it is not the only factor influencing the latter.

While a relationship exists in respect of car ownership and vehicle use (no matter the strength) the use of car parking limitation policies could be supported as a means to assist in managing road network congestion. However, it must be recognised that this relationship is only one of many factors that influence whether a resident will use their vehicle. Therefore, balance must be given to the argument of how reducing car ownership potentially impacts development viability, and therefore whether other variables in the car use equation should be managed before car ownership and parking provision.

The difficulty with the data available at this time, particularly as it relates to Melbourne is that, while a number of trends exist the importance of each relationship is not able to be quantified. This will require further research and the examination of data beyond that which is available through the ABS Census and VISTA. Ideally this would influence disaggregated (i.e. building-level) data whereby car parking provision, vehicle ownership, transport network attributes, and levels of car use could be quantitatively examined. A sufficient level of data would permit a regression analysis that could determine the relative strength of the former factors in determining the latter.

However, with the above in mind let us return to our central theme: *Parking Limitation Policies*.

While a relationship exists in respect of car ownership and vehicle use (no matter the strength) the use of car parking limitation policies could be supported as a means to assist in managing road network congestion.

However, it must be recognised that this relationship is only one of many factors that influence whether a resident will use their vehicle. Therefore, balance must be given to the argument of how reducing car ownership potentially impacts development viability, and therefore whether other variables in the car use equation should be managed before car ownership and parking provision.

In this regard consideration is given to a recent Victorian Civil and Administrative Tribunal (VCAT) case study to examine both views of reducing road network congestion and ensuring development viability.

Case Study: Caydon Cremorne No. 1 Development Pty Ltd v Yarra City Council (VCAT Ref: P1969/2015)

The site is subject to parking controls as part of a Development Plan Overlay identifying minimum parking requirements for residential dwellings as follows:

- 1 space per one or two-bedroom dwelling
- 2 spaces per three-bedroom dwelling

The development sought to provide residential parking at a rate below the statutory requirements (consistent with ABS Census car ownership data) and subsequently required a permit to reduce parking below the minimum requirements:

- 0.81 spaces to each one-bedroom dwelling
- 1.15 spaces to each two-bedroom dwelling
- 1.43 spaces to each three-bedroom dwelling
- On average this equated to an average of 0.92 spaces per dwelling across the overall development.

These rates were considered by the developer to reflect a feasible development mix of parking provision.

The responsible authority and its consultant (and subsequently adopted by VCAT) took a differing view requiring the provision of parking at the following rates:

- 0.5 spaces to each one-bedroom apartment
- 0.7 spaces to each two-bedroom apartment
- 1 space to each three-bedroom apartment

In addition, to the developer and Council views, many surrounding residents objected to the proposal stating that the proposal in its original form did not provide enough car parking.

The application of the responsible authority rates equated to a parking requirement of 74 less parking spaces. Such a reduction compromises some 74 dwellings previously considered from the developer's perspective to require a car parking space to be viable for sale.

The corresponding influence of such a reduction on vehicle movements however was only estimated to equate to 15 additional movements on the road network during the peak hour (based on a peak hour vehicle generation rate of 0.2 vehicle movements per car space). When spread across the peak hour this equates to an additional vehicle movement every 4 minutes.

From the above case study, while it is recognised that the surrounding road network is congested, the compromise to development viability would appear to be greater than the corresponding impact to the surrounding road network. Further additional relationships are also understood to exist which would also support reduced vehicle use, even in the event of a higher ownership including:

- The congested surrounding road network
- The site is well served by public transport
- The site is well linked with walking and cycling networks and further investment is being made in these networks by the developer
- The destination of many workers (CBD location) will be influenced by maximisation policies or parking charges which either don't allow and at a minimum discourages parking and driving.

6.1 Where to from here?

6.1.1 Parking limitation policies have a place...but in what form

Restricting parking can be necessary and does have an influence on car use. Indeed, maximum parking rates can be considered in areas where traffic congestion is problematic. However, these should not be set so rigidly so as to limit development viability. In achieving the right balance it is recommended that the maximum, in respect of residential parking, should be set to avoid gross over provision, with many other relationships existing which will also control car use.

This paper has focussed on limitation policies in respect of resident parking. Further consideration must also be given to limitation policies around commercial parking. In this regard, the use of limitation policies may indeed be most effective at the destination (e.g. CBD and activity centres) rather than restricting the residents' ownership.

While not strictly a limitation policy, the pricing of parking at the destination is also expected to play a decisive role in influencing vehicle use rather than restricting parking at the origin.

6.1.2 Parking controls must be introduced on a precinct wide basis

The introduction of parking limitation policies must be developed and applied on a precinct wide basis.

The application of maximum rates on a site by site basis, such as in the Cremorne example, plays on the singular relationship of vehicle ownership and vehicle use but do not recognise the other relationships at play, which are just as and if not more critical. Indeed, in many instances a site by site approach while providing minor reductions in vehicle use, if not coupled with suitable traffic management measures may simply act to free up local traffic capacity for through traffic or rat running movements rather than protecting residential amenity.

In areas where such limitation policies are required an integrated approach to transport planning and management is required to consider all modes of transport.

Site by site approaches also lead to inconsistent application of the controls by the responsible authority.

It is at this precinct level where the limitation policy can be appropriately balanced to consider the interlocking relationship and competing demands of the responsible authority, the developer and the community.

A precinct wide approach is also completely relevant should limitation policies be introduced for other reasons such as urban design.



6.1.3 Parking controls must be statutorily incorporated

Referring back to the earlier case study, a minimisation policy existed for the site, however through the course of the development progressing, a limitation policy was enforced upon it. This change in control has potentially significant impacts on feasibility calculations originally considered by the developer when purchasing the site. The limitation policy approach is also at odds with the expectations of the surrounding community who understood minimum parking requirements were to be provided resulting in differing amenity impacts to that expected.

It is therefore important that expectations are aligned between all stakeholders of development if we are to deviate from the stated statutory requirements.

This expectation alignment must also be delivered at a precinct level to ensure equity is provided to all stakeholders.

The importance of expectation alignment is highlighted in Figure 6.

Figure 6: Expectation Alignment

Council Officers	Councillors	Developers	The Community
<ul style="list-style-type: none"> Different officers assess different development proposals, potentially resulting in differing outcomes Officers change over time creating the potential for changing approaches to be applied 	<ul style="list-style-type: none"> Need clear direction to ensure that consistent well informed decisions can be made Councillor elections also result in a turnover of decision makers highlighting the need for consistent policy to be applied 	<ul style="list-style-type: none"> Developers need certainty that if investing in an area they can reasonably predict the outcome 	<ul style="list-style-type: none"> The community need to be informed if the goal posts have shifted to ensure that they do not unreasonably object to development

The most appropriate approach to achieve such consistency is through the incorporation of new statutory standards. In the case of the earlier case study this would be in the form of a *Parking Overlay* which represents a local parking policy which is incorporated through a formal municipal planning scheme amendment.

7. Conclusions

Policies which seek to reduce the provision of car parking spaces are generally based on the assumption that this will decrease car travel for reasons such as preventing increased car traffic from worsening congestion, or to encourage the use of other transport modes.

While this paper establishes through analysis of ABS and VISTA data that locations with higher car ownership have higher levels of car travel, these locations also differ on important variables such as ease of car travel (e.g. lower levels of congestion), public transport supply, average trip distances, and conditions conducive to walking and cycling.

These relationships are also vitally important in influencing the way in which trips are made. Therefore, it may be unreasonable to rely on the restriction of car parking as being the governing influence on reducing vehicle travel, particularly when balancing the needs of development viability.

Other research indicates a mixture of results across the spectrum ranging from there being no link between vehicle ownership and vehicle use to such a link existing.

This mixture of results also points to supporting the findings identified in Section 4 that vehicle ownership influences vehicle use however this is not the only relationship of influence.

In respect of our central theme: *Parking Limitation Policies* the following key conclusions can be drawn:

- Parking Limitation Policies have a place however these should not be set so rigidly so as to limit development viability. In achieving the right balance it is recommended that a maximum rate, as it relates to resident parking, should be set to avoid gross over provision, with many other relationships existing which will also control car use.
- Parking controls must be introduced on a precinct wide basis to ensure equity and an integrated approach to transport planning and management considering all modes of transport.
- Parking controls must be statutorily incorporated to ensure the expectations are aligned between all stakeholders of development and equitably applied.

References

ACT Government Environment and Sustainable Development, *Technical Amendment to the Territory Plan Variation 2013-02*, May 2013

Australian Bureau of Statistics, *Census Data*, 2011

Berkeley Group, *Does Car Ownership Increase Car Use – A Study of the of Car Parking Within Residential Schemes in London*, June 2013

Coath, C. *Parking: A Basis or Burden to Liveable and Accessible Communities*, 2011

Department of Transport, *Victorian Integrated Survey of Travel and Activity 2007 (VISTA 07)*, 2009

Department of Transport (prepared by Atkins on behalf of Department of Transport), *Research into the Use of Effectiveness of Maximum Parking Standards*, June 2008

GTA Consultants, *VCAT No. P1969/2015, Part of the Land at 2 Gough Street, Cremorne, Transport Impact Evidence*, December 2015

Guo, Z and Ren, S. *From Minimum to Maximum: Impact of the London Parking Reform on Residential Parking Supply from 2004 to 2010?*, Aug 2012

Litman, T. and Steele, R. *Land Use Impacts on Transport – How Land Use Factors Affect Travel Behaviour*, August 2015

Melbourne Planning Scheme, *Local Planning Policies Clause 22.09 – Car Parking in the Capital City Zone*, March 1999

Victorian Civil and Administrative Tribunal, *Caydon Cremorne No. 1 Development Pty Ltd v Yarra City Council [2016]*, VCAT Reference No. P1969/2015