

To	Willoughby City Council	From	Jacob Martin, Technical Director – Transport Planner Elizabeth Muscat, Senior Transport Planner
Project	304100900	Date	20 October 2022
Subject	Willoughby DCP – Review of Parking Rates Addendum: Regional Shopping Centre Parking Rates		

1 Introduction

In February 2021, Cardno delivered the Review of DCP Parking Rates for Willoughby City Council, which provided an evidence base for modifications for parking controls. The Review reflected the characteristics of CBD locations (St Leonards and Chatswood), Artarmon Railway Precinct and elsewhere in the LGA. The Review proposed a maximum parking rate of 1 space per 70 square metres for retail land uses within CBD locations.

In 2022, Council exhibited its draft comprehensive Willoughby LEP and DCP. Chapter F (Transport and Parking Management) of the draft Willoughby DCP included the parking rates as proposed in the Review of DCP Parking Rates report. Key outcomes of the exhibition included concern that the proposed maximum rate would result in a gradual erosion of parking in the CBD over time, in particular the parking which supports the regional shopping centres. This would ultimately have negative impacts on the economic viability of the CBD. Additionally, lower parking rates within the CBD may push the burden of parking supply to Council.

Cardno has been commissioned by Willoughby City Council to provide advice regarding appropriate minimum and maximum parking rates for a 'regional shopping centre' land use.

Key considerations for the Review include:

- > The Chatswood CBD includes the Westfield, Chatswood Chase and Mandarin Centre, and visitors of these locations often share parking spaces
- > The retail centre also includes a number of recreation and leisure land uses
- > The parking rates should still encourage sustainable mode shift to manage congestion, yet needs to acknowledge the important role of private vehicles in economic activity.

The recommended parking rates are intended to apply specifically to large-scale retail development in the Chatswood CBD, including discussion regarding scale triggers and reference to multi-modal access and parking requirements.

This Technical Memorandum considers the impacts of entertainment land uses (dining, cinema and other entertainment uses) on peak period parking requirements, providing policy recommendations for the integration of entertainment and retail uses under a combined 'regional shopping centre' land use. This accounts for the increased intensity of demand as well as the time-of-day effects.

The derived regional shopping centre rate is also discussed in the context of the St Leonards CBD, which was previously assessed in detail through the St Leonards / Crows Nest Parking Demand Analysis Report (2018). This includes consideration for the differences and similarities in land use mix, and the effects of dense residential and office development, the availability of public parking, and the opportunities for alternative transport.

The approach to recommending updated parking rates is to analyse and compare reputable sources of parking generation, parking surveys and demand profiles and apply findings to the Chatswood CBD.

2 Retail Environment – Chatswood

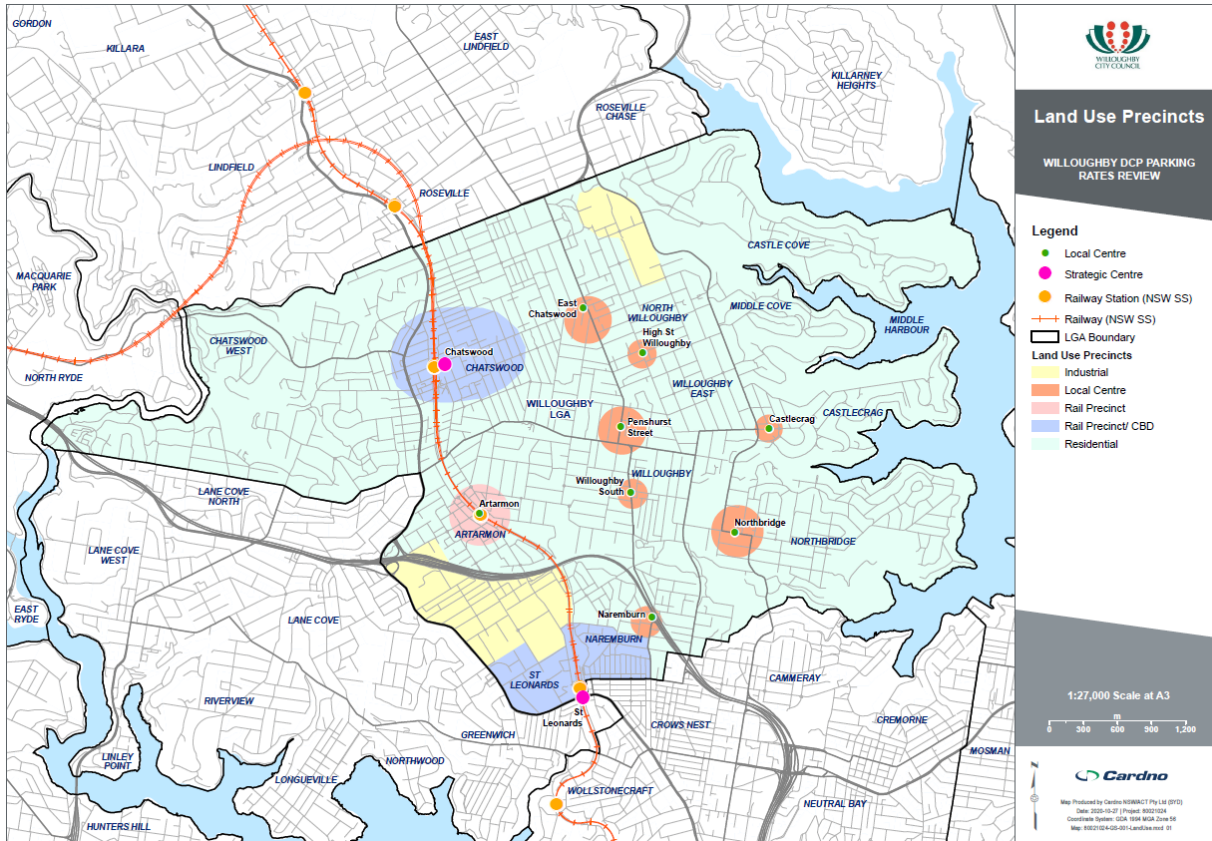
A number of Shopping Centres are located within Chatswood, including within the retail centre along or near Chatswood Mall, with available information described in **Table 2-1**. The Chatswood CBD location is shown in **Figure 2-1**.

Table 2-1 Shopping centres within Chatswood CBD

Shopping centre	Description
Chatswood Chase	<ul style="list-style-type: none"> > 63,800sq.m + 2,434 parking bays > 209 stores including 36 casual and takeaway dining venues.
Lemon Grove Shopping Centre	<ul style="list-style-type: none"> > 60 stores including a number of eateries.
Mandarin Centre	<ul style="list-style-type: none"> > 13,000sq.m + 303 parking bays > Various entertainment venues including bowling, Hoyts cinema and club venues > 17 stores
The Gallery	<ul style="list-style-type: none"> > 22 stores
Victoria Plaza	A number of restaurants, supermarkets and local services.
Westfield Chatswood	<ul style="list-style-type: none"> > 81,100sq.m + 2,831 parking bays > video arcade and 6 movie screens (2,050 seats) > 282 stores, including 58 casual and takeaway dining venues.

Each of these Shopping Centres provides a variety of destinations and scales, with a wide range of on-site parking provision rates. For the purpose of this Review, Centres will be considered both as individual sites and as a single 'regional shopping centre'.

Figure 2-1 Willoughby City Council land use precincts (Willoughby DCP Parking Rates Review)



3 Parking Guidelines and Surveys

3.1 Institute of Transportation Engineers – Parking Generation: 4th Edition

The Institute of Transportation Engineers' Parking Generation: 4th edition represents a valuable source of parking generation information from the United States of America. Though the environment differs in many respects to that of Australia, the results reflect a baseline trend and demand rate for parking which can be considered in the context of the local environment.

ITE Parking Generation summarises the parking generation findings for the 'Shopping Centre' definition for Weekday Peak Hour (PM) and Saturday Peak Hour Parking Occupancy, for both December and non-December periods. For the purpose of this assessment, December parking occupancies are considered, which generally reflects the representative 'design day', and provides a greater degree of conservatism.

Shopping Centres are categorised in the ITE *Parking Generation* by size into the following five types (note that floor area yields in Gross Leasable Area (GLA) are converted from square feet to square metres):

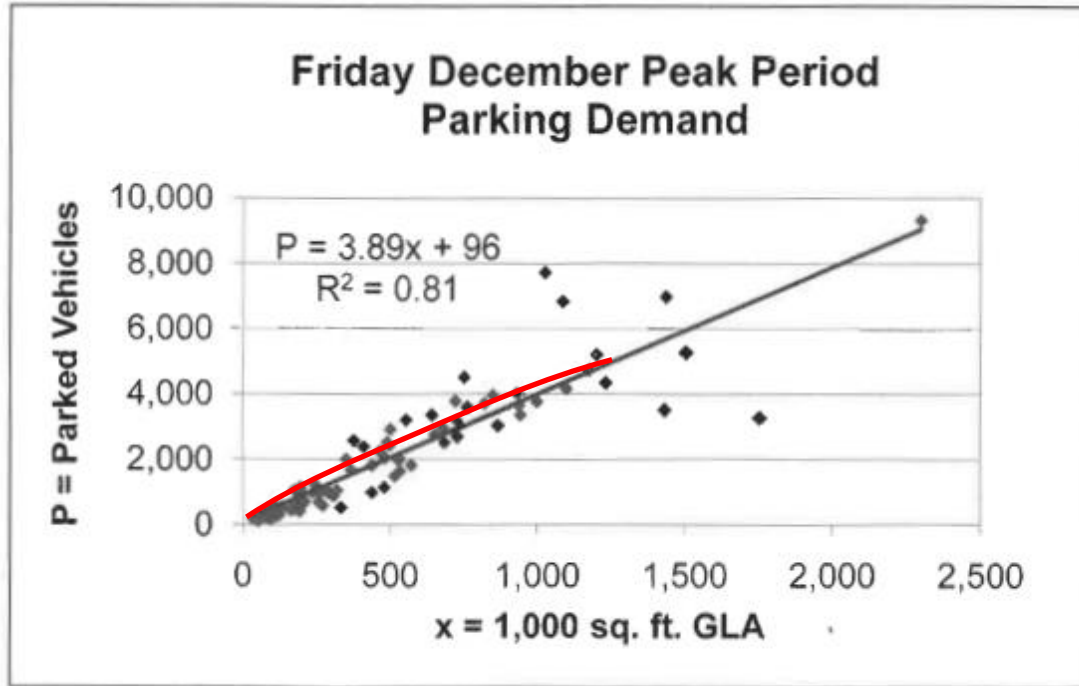
- > Strip (<2,800sq.m)
- > Neighbourhood (2,800sq.m – 9,300sq.m)
- > Community (9,300sq.m – 37,200sq.m)
- > Regional (37,200sq.m – 74,300sq.m)
- > Super Regional (>74,300sq.m).

The supply rates for the observed centres follow an interesting trend, where parking provision increases through to the 'Regional' scale, but then declines for 'Super Regional' shopping centres. This behaviour may reflect the availability of alternative parking provision in surrounding areas. Given the US context, it is unlikely that the reduction in supply is related to improved public transport service. However, it is noted that peak parking demand in areas with better public transit was 1-8% lower than poorly-served locations.

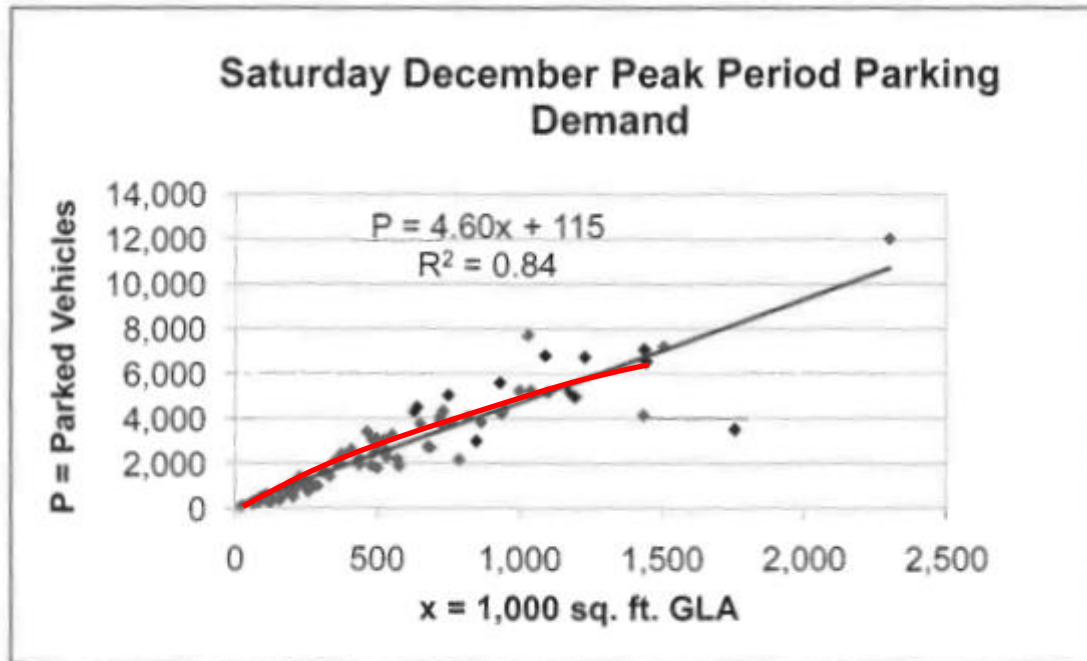
Unlike many of the parking demand rates described in the *Parking Generation* guideline, the data defines a fairly linear trend (at least through to approximately 80,000sq.m) at around 4.0-5.3 bays per 100sq.m GLA. However, the line of best-fit appears to flatten out slightly for larger centres.

The peak hour parking generation by shopping centre size for a typical Friday and Saturday in December as described by ITE is shown in **Figure 3-1**, including the linear line of best-fit identified in the *Guideline*. Also shown is an improved best-fit curve (in red) which acknowledges the reduction in parking generation as centre size increases. **Figure 3-2** shows this same curve, modified to described the *rate* of parking demand against shopping centre size.

Figure 3-1 ITE Parking Generation – Peak Hour Parking Generation by Shopping Centre Size



◆ Actual Data Points — Fitted Curve/Average Rate

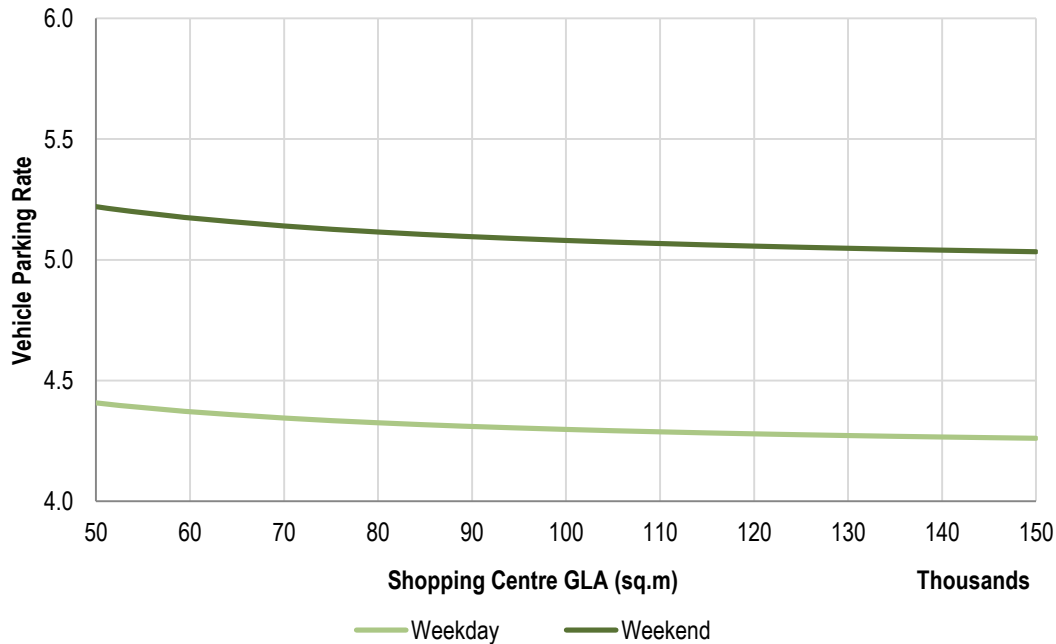


◆ Actual Data Points — Fitted Curve/Average Rate

Source: ITE Parking Generation 4th ed.

Showing the mean parking demand curve as a function of yield and zooming in on the larger centres (greater than 50,000sq.m) shows the subtle shift in parking demand rates observed, as outlined in **Figure 3-2**.

Figure 3-2 ITE Parking Generation – Peak Hour Parking Generation by Shopping Centre Size



Source: Adapted from ITE Parking Generation 4th ed.

This chart demonstrates that as floor space increases, parking generation rates decrease for both weekday and weekend parking generation. This effect is small, but suggests that there is some impact as a result of centre size, irrespective of other factors.

Note that trip generation rates for shopping centres are known to decline significantly as centre size increases. The much flatter curve shown above is indicative of longer duration-of-stay by visitors, related to the scale of development and the greater offer of retail, services and entertainment.

This effect is greatest for visitation within a single shopping centre, but should extend to other retail locations where they are located nearby. In this way, the various shopping centres in Chatswood function as a single shopping experience, with smaller destinations peripheral to the large anchor centres. Where this occurs, destination retail parking is most likely to be at the large anchor store or in consolidated public parking facilities.

3.2 RTA Trip Generation Data Report – Shopping Centres (2011)

This Report collates the results of a series of trip generation and parking surveys undertaken within Sydney and NSW regional centres to supplement previous (potentially outdated) work. The results from these surveys are then compared with similar data available from the other Australian road / planning agencies and various overseas organisations to assess the relevance and applicability of that data for use in the local context.

The following results are considered pertinent in the Chatswood context:

- > The number of parking spaces provided on-site varied from 3.6 to 4.9 spaces per 100sq.m of Gross Leasable Floor Area (GLFA)
- > The seasonally adjusted parking demand varied from 2.8 to 5.3 spaces per 100sq.m GLFA (note that demand significantly exceeded supply in some locations)
- > However, surveys at several sites indicated that peak parking demand had exceeded the parking supply.

In addition, parking demand was calculated from trip movements at the periphery, and included only on-site parking (neglecting potential overspill into adjacent streets/ parking areas).

The data extracted from surveys and adjusted for seasonal changes is summarised in Error! Reference source not found..

Table 3-1 Seasonally adjust parking demand rates (RTA Trip generation Data Report)

Range in Total Floor Area (GLFA - m ²)	Car Parking Spaces per 100m ² GLFA			
	Thursday	Friday	Saturday	Sunday
0 - 20,000	3.2	3.2	3.7	2.8
20,000 - 40,000	3.9	3.7	5.3	4.0
40,000 - 60,000	4.4	4.3	4.9	3.7
60,000 - 80,000	3.6	3.5	4.4	4.0
Above 80,000	3.6	3.1	3.5	3.0

These results do not show any consistent trend, with different centres showing various peak parking days and magnitudes.

The findings of the NSW study were compared against a variety of different guideline documents from around the world to understand the compatibility of the results, as shown in **Table 3-2**.

Table 3-2 Summary of comparison of parking demand rates (RTA Trip generation Data Report)

Table 5.14 – Summary Comparison of Parking Demand Rates

	Weekday (non-Friday)	Thursday	Friday	Saturday	Sunday
NSW	-	3.72	3.43	4.07	3.50
NZ TDB	-	2.95	3.06	3.13	4.17
US ITE	2.74	-	3.16	3.09	2.20
UK TRICS	-	2.34	4.44	4.45	3.53

This comparison shows that parking demand by jurisdiction does vary substantially, with an average peak demand of approximately 4.0 – 4.5 spaces per 100sq.m.

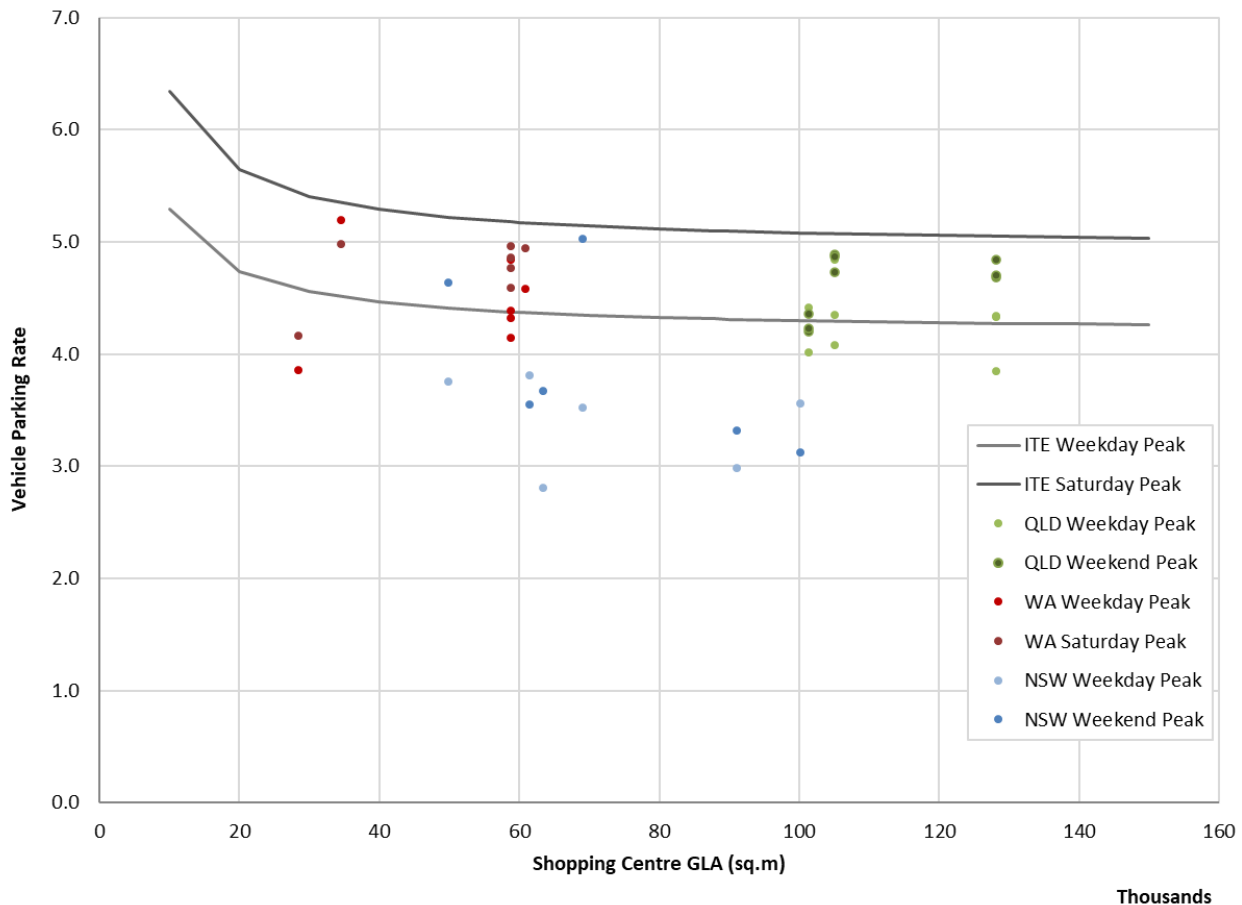
3.3 Parking Surveys

The results of parking surveys embedded in RTA guidelines, as well as a sample of large shopping centres across Western Australia and Queensland from Cardno, now Stantec's previous experience are shown against the ITE baseline average in **Figure 3-3**.

These outcomes show that in general, parking demand in NSW tends to be lower than for equivalent centres, and that larger centres still require marginally fewer parking bays than smaller ones. This difference in baseline parking generation rates tends to reflect a lower car-dependency rate than in other States, and a decreased prevalence in destination shopping centres located outside of Activity Centres.

In contrast to centres of an equivalent size in Queensland, Western Australia or the United States, regional shopping centres in NSW tend to be located at the heart of a dense urban frame, with a large local catchment of nearby residential and employment activity. This environment increases the proportion of local trips which can be completed by active transport or leveraging alternative all-day employee parking.

Figure 3-3 Parking survey results – comparison against ITE baseline averages (multiple sites)



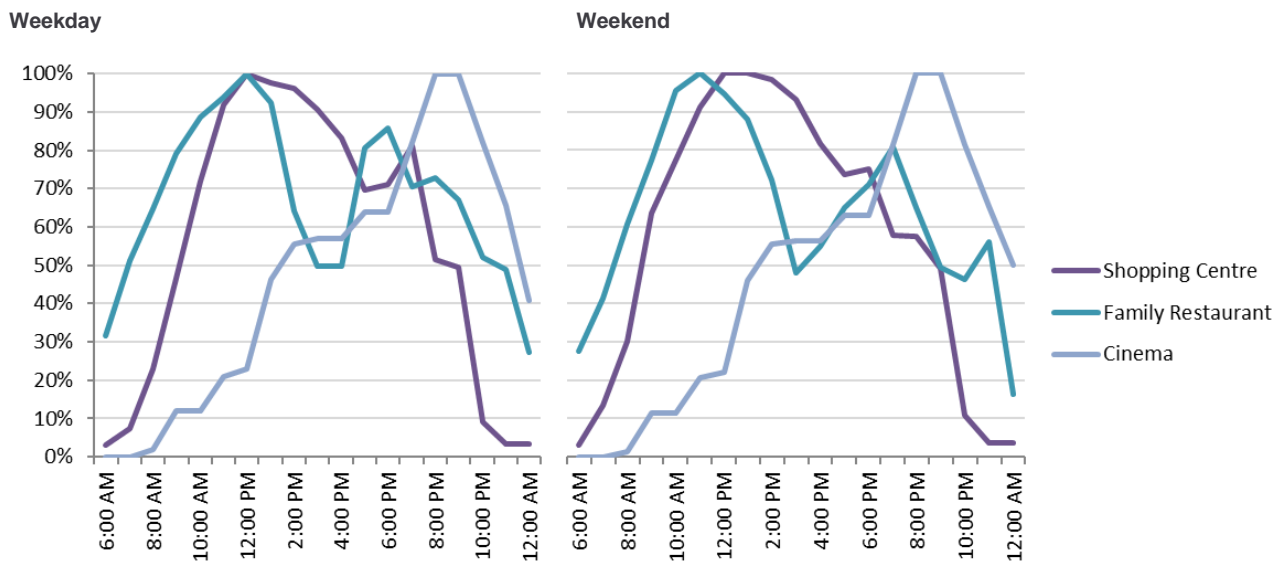
3.4 Parking Demand Profiles

The parking demand profile for a shopping centre is highly dependent on factors including its location and constituent land uses. It is therefore difficult to identify the individual influence of specific internal uses on the overall function and requirement for parking.

This reinforces the need to establish a consistent parking rate for shopping centres that transcends the individual uses making up that centre, to ensure that it can continue to operate within the bounds of its development approval as tenants change.

Figure 3-4 shows generic demand profiles for three different land uses, extracted from Urban Land Institute (ULI) *Shared Parking* and *ITE Parking Generation*: shopping centre retail, family restaurant and cinema.

Figure 3-4 Generic parking demand profiles by time of day



Restaurant parking demands tend to align with both retail **and** entertainment uses, but retail and entertainment parking demands do not coincide.

The influence of each of these uses depends on its proportion of the development, but in general, the theoretical peak parking demand for each use can be given as follows:

- > Shopping Centre: 3.5-4.5 spaces per 100sq.m
- > Cinema: 1 seat per 1.5sq.m, and 0.15 spaces per seat (10 spaces per 100sq.m)
- > Restaurant: 4-5 spaces per 100sq.m.

The peak parking demand for these non-retail components is therefore higher than the retail parking. This is offset by the fact that the entertainment and restaurant components of such centres tend to be significantly smaller than retail, and that entertainment and dining facilities tend to have a greater attraction for internal trips (which do not require additional parking).

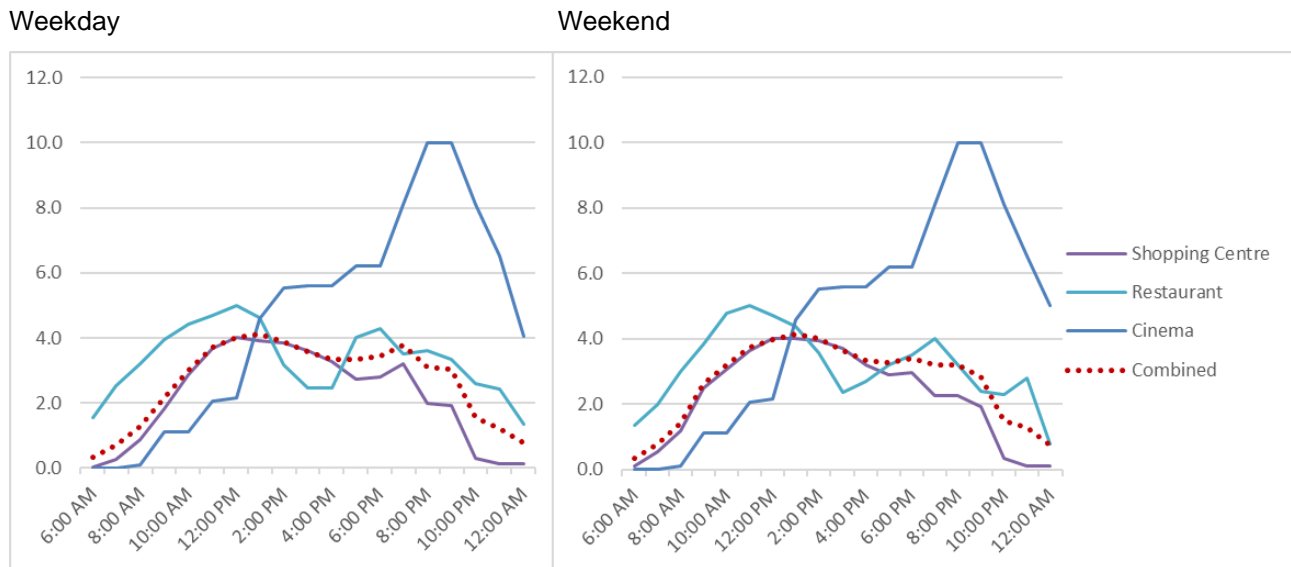
Large shopping centres differ from smaller retail outlets in their perception of parking. These regional shopping centres see on-site parking as a substantial draw for regional destination shopping trips, and so it is often the developer that is pushing Council for additional parking. There is also a common requirement from key anchor tenants to provide a set minimum number of parking bays – a value that is often higher than the relevant DCP rate.

For these reasons, it is likely that large-scale shopping centres will provide parking at the upper end of any DCP range, with smaller retail outlets relying on nearby public facilities to supplement public transport for access.

3.5 Effects of non-Retail Floor Area

A theoretical centre with a land use distribution allocated at 70% to retail, 20% to dining and 10% to entertainment has been modelled in **Figure 3-5** to investigate the overall impact of non-retail uses within a regional shopping centre.

Figure 3-5 Combined generic parking profiles



This combined centre generates a peak demand roughly equivalent to the 'retail' generation, with an increase in evening parking demand. Varying the proportions of entertainment and dining has only a small impact on peak period parking generation. This suggests that for a shopping centre that comprises a mixture of uses, it remains appropriate for a single 'regional shopping centre' rate to be applied irrespective of the internal land use mix.

3.6 Comparison to Proposed DCP Rates

The above theoretical generation rates are considerably higher than those recommended in the Willoughby DCP, which take into account off-site car parking, access to alternative transport modes and the significant internal trip capture resulting from nearby residential and office development.

The CBD rates recommended in the Willoughby DCP Review (for Chatswood and St Leonards), are set at the following maximum values:

- > Shopping Centre: 1.43 spaces per 100sq.m
- > Cinema: none stated
- > Restaurant: 2.0 spaces per 100sq.m.

These rates are approximately 40% of the theoretical parking demand rates. The Chatswood CBD operates as both a dense mixed-use activity centre, and as a regional shopping destination. This dual function implies that the actual requirements for car parking likely lie somewhere between the theoretical parking demand rates and the maximum values set in the DCP.

Two additional factors are also considered:

1. Due to the location of the various shopping destinations within the CBD structure, Chatswood shopping centres provide a de-facto public parking supply for short-stay use by visitors to the CBD core.

2. Any application of parking rates to future retail expansion would likely apply only to the incremental increase in floor area. For example:
 - a. Chatswood Chase currently provides parking at approximately 3.8 spaces per 100sq.m. Increasing the floor area by 25% and providing parking at 2.5 spaces per 100sq.m would result in an overall parking supply of 3.55 spaces per 100sq.m.
 - b. Similarly, Westfield Chatswood provides parking at approximately 3.5 spaces per 100sq.m. Increasing the floor area by 25% and providing parking at 2.5 spaces per 100sq.m would result in an overall parking supply of 3.3 spaces per 100sq.m.

Existing parking infrastructure therefore buffers the impact of change on future development. In addition, any future development is likely to coincide with office and residential growth within the Chatswood CBD. This will increase the likelihood of internal trips, driving down the need for parking. This effect is particularly prevalent for dining and entertainment uses, where demand is even more likely to be generated by nearby development.

4 Application to St Leonards CBD

St Leonards provides a larger floor area of office space and additional employment (33,000 employees vs 20,000 in the Chatswood CBD), though with marginally fewer residents (estimated 8,000 residents compared with 12,000 in the Chatswood CBD).

These factors tend to result in a reduced need for retail parking in St Leonards, compared with Chatswood (employees accessing retail, dining and entertainment services and leveraging private or public parking facilities outside of shopping centres). St Leonards also has a large supply of public parking that is available for use outside of office hours to supplement shopping centre parking.

These factors, in addition to the strong public transport provision, make St Leonards resilient when it comes to on-site parking shortfalls. The differences between the access, parking and development environments indicates that developers may make different decisions with respect to increasing supply. However, there are enough similarities to suggest that a consistent parking rate can be applied to both Centres under a revised DCP, particularly where a *range* for parking rates is given (i.e. a banded rate with a maximum and minimum).

5 Recommendations

5.1 Summary of findings

- > There is value in creating a consistent parking rate for regional shopping centres that transcends the individual uses making up that centre, to ensure that it can continue to operate within the bounds of its development approval as tenants change.
- > The various shopping centres in Chatswood function as a single shopping experience, with smaller destinations peripheral to the large centres. Where this occurs, parking is most likely to be at the large anchor store.
- > Large shopping centres differ from smaller retail outlets in their perception of parking. Regional shopping centres consider on-site parking to be a substantial draw for destination shopping trips, and key anchor tenants may also require a set minimum number of parking bays. Smaller retail outlets have a smaller catchment and more capacity to leverage nearby public parking facilities to support trade.
- > Evidence from parking occupancy surveys shows that as the centre size increases, parking generation rates decrease for both weekday and weekend parking generation due to the interactions of land uses.
- > The Chatswood CBD operates as both a dense mixed-use activity centre, and as a regional shopping destination. This dual function implies that the actual requirements for car parking likely lie somewhere between the theoretical parking demand rates and the maximum values set in the DCP.
- > Existing public and private parking infrastructure buffers the impact of change on future development. In addition, any future development is likely to coincide with office and residential growth within the Chatswood area. This will increase the likelihood of internal trips, driving down the need for parking, particularly for dining and entertainment uses.
- > While there are differences between the access, parking and development environments between Chatswood and St Leonards, there are enough similarities to suggest that a consistent parking rate can be applied to both Centres under a revised DCP, particularly where a *range* for parking rates is given (i.e. a banded rate with a maximum and minimum).

5.2 Recommended parking rates

As a result of the interplay between regional and internal trips, the differences in residential and employment density, and the variation in the makeup of regional shopping centres, it is recognised that a range of parking needs must be considered.

Considering this, the DCP rate for a 'regional shopping centre' land use is recommended to comprise the following:

- > A shopping centre within the CBD area (St Leonards and Chatswood) that is greater than 30,000sq.m is considered to be a 'regional shopping centre'. This definition is consistent with the Property Council of Australia.
- > Minimum parking rate: 1 space per 70sq.m (1.43 spaces per 100sq.m)
- > Maximum parking rate: 1 space per 40sq.m (2.5 spaces per 100sq.m)
- > This rate will apply for any incremental increase in floor area as a result of (re)development of retail premises within the CBD area (St Leonards and Chatswood) that are <30,000sq.m would retain a maximum parking rate of 1 space per 70sq.m, with no minimum parking rate.

The above rates have been chosen to complement the maximum DCP parking rates for smaller retail premises, while also allowing 'regional shopping centres' to have a level of car parking that supports destination trips. This acknowledges their function as de facto public short-stay parking for the surrounding precinct and recognises the economic benefits that come with accommodating some level of vehicular access for CBDs.

The recommended rate of 2.5 spaces per 100sq.m has been chosen because it remains below the unrestrained parking demand rate (as evidenced by RTA research), but will result in only an incremental reduction in the rate of supply following redevelopment.