

Maroochydore City Centre – Car Parking Management Strategy

Final Report

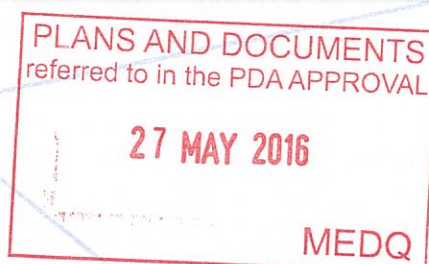
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Prepared by
MRCagney Pty Ltd

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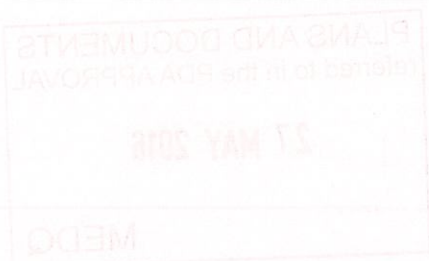
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1 Introduction

1.1 Background to this Report

The Maroochydore City Centre has been identified as a key development area in one of Australia's fastest growing regions, and presents a unique development opportunity on the Sunshine Coast. The existing Horton Park Golf Club comprises the majority of the 62 ha site in central Maroochydore which has been earmarked for future development, forming the Maroochydore City Centre Priority Development Area (PDA). Development of the site presents an exceptionally rare opportunity to apply modern principles of quality urbanism to a large greenfield site in central Maroochydore, and capitalise upon the planned provision of further public transport infrastructure in the area.

We understand that Council is currently involved in an in depth planning programme in pursuit of best practice urban planning outcomes for this unique site, and as part of this process a quality Car Parking Management Strategy is required to guide parking policy throughout the development of the PDA. While this report focuses on the development of the PDA, it is stressed that in order to achieve the stated objectives for the site it is vitally important that recommended policies outlined in this report are applied consistently beyond the PDA to the entire Sunshine Coast metropolitan area, most critically Maroochydore and Mooloolaba.

This Car Parking Management Strategy focuses on how to facilitate a vibrant urban environment that serves the needs of both residents and visitors through appropriate parking policies. The Maroochydore City Centre is in an advantageous position in that many elements that create successful and exciting urban centre environments are present or nearby, however the risk in developing a greenfield site is that an oversupply of parking in inappropriate locations can easily be provided in order to appease outdated planning ideals, without properly considering the relationship between parking policy and urban design outcomes. Conversely, as a greenfield site, the Maroochydore City Centre site is unencumbered by years of sub-optimal development, and the rare opportunity exists to create a new city centre based on progressive parking policy ideals and best practice urban design principles from the outset.

1.2 Understanding Parking Policy

There is growing interest in the impacts of parking on transport and land use outcomes. Parking is clearly an essential component for supporting private vehicle travel, however it can also be expensive to provide, if only by virtue of the large amounts of space that it requires. Under-priced parking may also stimulate vehicle travel and contribute to growing congestion.

Council must therefore provide the correct supply, correctly priced, consistent with the desired transport and land use objectives for the Maroochydore City Centre.

1.2.1 Formulating Parking Policy Objectives

The primary aim of parking policy is to ensure *the right amount of parking is provided in the right place and at the right price*. *The right amount of parking* is that which supports local accessibility and economic activity without compromising the safety and efficiency of the transport network. *The right place* for parking depends on wider urban design outcomes to preserve the safety and efficiency of the transport network, while also contributing to amenable urban forms, especially for pedestrians. Lastly, *the right price* for parking is understood in terms of two distinct periods, namely:

- *Short run*, where parking should be priced to achieve 80-90% utilisation; and
- *Long run*, where parking should be priced so that drivers cover the costs of provision.

While the optimal short run price for parking may, at times, diverge from the optimal long run price, over time the short run price should converge with the optimum long run price.

When considered in this way, the aim outlined at the start of this section can be linked to several more specific policy objectives:

- Support local accessibility and economic development without compromising the safety and efficiency of the transport network;
- Contribute to high-quality urban outcomes, with a particular focus on the amenity of the pedestrian environment; and
- Ensure the price of parking maintains demand and turnover at appropriate levels and is sufficient to cover the long-run cost of providing parking.

1.2.2 The Unintended Consequences of Current Parking Policy

The current approach to car parking policy has lead to a range of negative transport and land use outcomes, including but not limited to:

- Travel demands – Current parking policies generally operate on the premise that parking should be free, unless attenuating circumstances are sufficient to warrant implementing priced parking. This inevitably leads to car owners undervaluing the cost of car storage/parking, which contributes to higher than optimal levels of vehicle ownership and use, worsening congestion, and increased transport costs;
- Land use patterns – Current parking policies focussing on off-street parking to satisfy demand reduce urban density, which undermines agglomeration economies and reduces the attractiveness of walking/cycling;
- Social and environmental impacts – By stimulating driving, reducing urban density, and suppressing uptake of alternative modes, current parking policies have a number of negative social and environmental impacts, including poorer air quality, increased household energy costs, and poor population health; and
- Economic impacts – Ultimately, the aforementioned issues flow through into a range of negative economic impacts. Reduced pedestrian interaction with town centres undermine the productivity of our cities and towns and lower our overall quality of life, which is directly related to the car reliance that current parking policy feeds into.

In short, while current parking management policies and practices have successfully ensured that drivers have access to abundant, free parking almost whenever and wherever they travel by car, in the process they have unintentionally contributed to a host of undesirable consequences. Consequently, most cities and towns, both here and overseas, are moving away from a 'predict and provide' approach to parking policy, and instead adopting more 'performance-based' policies. The latter focuses on managing demand using price signals, rather than increasing supply through policy.

1.3 Managing Parking Efficiently

Notwithstanding the fact that current parking policies have led to an over-supply of under-priced parking, we must ensure that existing or planned parking is managed efficiently. Indeed, an efficiently managed parking supply will contribute to improved accessibility, mobility, and economic development. Efficient management begins with an understanding the following two key performance indicators:

- Turnover – which measures the number of cars per hour [cars/hour]; and
- Utilisation – which measures the occupancy of car-parks at any point in time [%]

The 'productivity' of a car-park (or car-parks) is then readily calculated as follows:

$$\text{Productivity} = \text{Utilisation} \times \text{Turnover}$$

When productivity is multiplied by average vehicle occupancy it can be used to predict the number of pedestrians an individual car-park will contribute to the surrounding area, as follows:

$$\text{Pedestrians} = \text{Vehicle occupancy} \times \text{Productivity} = \text{Vehicle occupancy} \times \text{Utilisation} \times \text{Turnover}$$

And when the number of pedestrians is multiplied by average retail spending per visitor (per day) then one can predict the total retail spend enabled by an individual car-park:

$$\text{Total retail spend} = \text{Average retail spend} \times \text{Pedestrians}$$

Having established these definitions it is clear that the most effective parking policies will be those that result in high utilisation; high turnover; high vehicle occupancy; and high average spend.

1.4 Consistency of Parking Policy Outside the PDA

Because the PDA exists within an established urban environment, a major shift in parking policy within the PDA will affect the way the study area interacts with adjoining urban areas. This City Centre Car Parking Management Strategy must be supported by consistent application of the policies and themes outlined herein to the greater Maroochydore area, and indeed the entire Sunshine Coast urban area, in order for the stated objectives to be fully realised. While an uncoordinated adoption of best practice principles in the PDA alone can create a successful, walkable and prosperous centre, if surrounding areas necessitate car travel for a majority of the population, this will impede such people from fully participating and contributing to the city centre as desired.

The new parking rates and demand management strategies recommended in this report are broadly suited to all urban environments, and will bring benefits to the greater Sunshine Coast region. Wider adoption of these recommendations, or similar, will ensure that incumbent parking and transport policies outside the PDA do not continue to induce an overreliance on car travel and subvert efforts to create an active and vibrant urban environment supportive of walking, cycling and public transit within the PDA.

2 Maroochydore City Centre

2.1 What Do We Want Maroochydore City Centre to Look Like?

The Car Parking Management Strategy is only of value if it works towards creating the type of urban environment that the community wants. It forms part of a planning framework that seeks to guide future development towards desired outcomes for Maroochydore and the region, and its purpose is to ensure that parking policy supports these broad visions for the area. The basis of this strategy is therefore, what do we want Maroochydore City Centre to look like?

To guide the preparation of this report, MRCagney have focused on the following broad aspirational targets for the Maroochydore City Centre:

- Create a compact and walkable urban form;
- Fundamentally support and cultivate pedestrian traffic above other transport modes;
- Create an urban form that supports best practice transit solutions;
- Create streets for people;
- Create a bicycle friendly city centre;
- Invite the development of an eclectic mix of retail, commercial and residential uses;
- Create a city centre that does not require residents or visitors to own a car in order to interact with the city or the community;
- Provide parking based on industry best practice; and
- Promote Council's vision to be Australia's most sustainable region – vibrant, green and diverse.

2.2 Existing Approach to Parking Supply in Maroochydore

In preparing this report, MRCagney has reviewed, providing commentary where required, parking policy contained within the following documents:

- Sunshine Coast Council Planning Scheme;
- Maroochydore City Centre PDA Development Scheme;
- Draft Maroochydore City Centre PDA Integrated Transport Plan; and
- Draft Sunshine Coast Council Car Parking Management Strategy.

All of the above documents fundamentally approach parking with a view to satisfying projected demand, and generally seek to achieve this using minimum parking requirements. In order to create the desired urban outcomes for the Maroochydore City Centre, MRCagney have outlined a different, but thoroughly contemporary, approach to parking policy within this report.

2.3 Creating a New CBD

It is recognised that the project brief references the need to consider staging of parking policy provisions to account for the growth of public transport in the area as the town centre develops. This is not considered a productive approach for several reasons:

- If Council provides staged parking rate requirements, early developments constructed with higher parking supply rates will not support the ultimate goal of creating a compact and vibrant new CBD environment and will create holes in the streetscape that will effectively form obstructions to walkability. This is actively working against achieving Council's and the communities aspirations for Maroochydore;
- Once private off-street parking is provided, it is difficult to remove;
- Off street car parking provision for individual developments creates an oversupply of parking by not accounting for cross-use and temporal parking demand (i.e. where users access multiple tenancies from a single car park, and when multiple uses have different peak parking demand periods across the day).

It is recognised however that public transport, pedestrian traffic, supporting uses, and the overall attractiveness of the centre will grow as density and development is provided, and as such, early developments will have a greater reliance on private vehicle transport and parking. The mechanism used to support and encourage these early developments is important, as the long-term success of the area requires the issues discussed above to be avoided.

This is done as follows:

1. Implement ultimate aspirational parking rates immediately; and
2. Construct consolidated public parking immediately in line with future parking supply requirements.

This ensures:

- All development, from the beginning, will actively contribute to a compact, pedestrian focused, urban form and streetscape;
- Early development is provided with a high parking supply rate;
- As further development occurs with minimal or no increase in supply (as mandated using maximum parking supply rates), the parking rate is consistently reduced; and
- Consolidated parking is provided, which:
 - Utilises space more efficiently
 - Requires a lower total parking provision by encouraging multi-use trips and accommodating uses with different peak periods of operation with the same parking supply;
 - Provides a clear and easily accessible parking provision, reducing the prevalence of circulating vehicles searching for on-street car parks, thus reducing on-street traffic;
 - Encourages multi-use trips, walking between uses, greater pedestrian volumes past shop fronts, improved streetscape amenity, and better retail performance; and
 - Allows a denser and more compact development pattern to occur, with fewer driveways and surface car parks separating adjacent uses.

3 Best Practice Review

3.1 Existing Queensland Based Best Practice Guidelines

3.1.1 QLD TOD Guidelines

The Transit Oriented Development: Guide for Practitioners in Queensland, commonly referred to as the QLD TOD Guidelines, is designed to build understanding of the transit oriented development (TOD) concept and best practice application in Queensland. These guidelines provide information covering urban density, community diversity and various technical standards and specifications, including parking rates.

The TOD Guidelines support the adoption of maximum parking rates, demand reduction measures, and the application of best practice urban design principles. Demand management strategies suggested include unbundling parking, consolidation and sharing of parking between different developments and land uses, introduction of car share schemes, and priced parking. Table 3.1 outlines the suggested maximum parking rates for different TOD precinct types. The varying rates recognise the different functions, demand for parking, density and supply of transit in different precinct types. The guideline suggests that parking should not exceed the base maximums, and adoption of the preferred maximums is strongly encouraged.

An additional key feature of the TOD Guidelines is the simplification of land uses to residential and retail and office, preventing the transition to different uses being stifled by onerous and complex parking requirements.

Table 3.1: TOD Guidelines - Indicative Maximum Parking Rates

Precinct Types	Residential (Car Spaces per Unit)		Retail and Office (Square Metres per Car Space)	
	Base Maximum	Preferred Maximum	Base Maximum	Preferred Maximum
City Centre	0.75	0.5	400	600
Activity Centre	1	0.75	100	200
Specialist Activity Centre	1.25	0.75	100	150
Urban	1	0.75	200	300
Suburban	1.25	1	75	100
Neighbourhood	1.25	1	50	100

3.1.2 Complete Streets

Complete Streets outlines a uniform approach to designing streets in Queensland. The guideline acknowledges that both on-street and off-street parking plays an extremely important role in the design of streets and the role that parking can play in travel demand.

Adoption of maximum rates is recommended throughout, particularly in areas where alternative transport options such as public transport, walking and cycling exist. Recommended maximum parking rates are derived from a review of parking rates from planning schemes throughout Queensland and from extensive research on urban mixed-use areas.

Table 3.2 provides an overview of the suggested maximum parking rates contained within Complete Streets. These along with rates contained in the TOD Guidelines provide an indicative guide as to the parking rates that the Sunshine Coast Council should stipulate for the Maroochydore City Centre.

Table 3.2: Complete Streets Indicative Maximum Parking Rates

Location	Commercial (Locations with Quality PT Access)	Commercial	Residential (Locations with Quality PT Access)	Residential
Capital CBD	1 space per 500m ²	1 space per 200m ²	0.5 spaces per unit/house	1 space per unit/house
Regional CBD	1 space per 150m ²	1 space per 100m ²	1 space per unit/house	1.25 spaces per unit/house
Capital Suburb	1 space per 100m ²	1 space per 75m ²	0.75 spaces per unit/house	1 space per unit/house
Regional Suburb	1 space per 75m ²	1 space per 50m ²	1 space per unit/house	1.25 spaces per unit/house

3.2 Case Studies

3.2.1 Gladstone

Gladstone currently imposes high minimum parking rates that appear to impact on the vitality and general appeal of the CBD. Issues include, but are not limited to:

- A marked lack of pedestrian activity resulting from parking oversupply via minimum parking rates;
- A perceived undersupply and an actual oversupply of car parking;
- A perception that some types of development are not viable in Gladstone due to high minimum parking rates; and
- A perception that parking undersupply is negatively impacting on CBD retail trade.

Gladstone Regional Council is consequently reviewing their parking rates and the use of minimum rates altogether. Maximum parking rates and a simplification of specified land uses are being considered. A set of rates under consideration are provided in Table 3.3. These rates are in line with, but slightly more generous than the parking guidelines in “Complete Streets”.

Table 3.3: Gladstone Maximum Parking Rates under Investigation

Land Use	Parking Requirement
Non residential	Max 1 space per 50m ² GFA
Residential – permanent	Max 1 space per dwelling (site average)
Residential - serviced/short term	Max 1 space per 3 units

3.2.2 City of Cockburn, Western Australia

Cockburn Central is a mixed-use TOD located in Perth’s growing southwestern corridor. A review of their parking rates in 2007, reflecting the transit-oriented nature of the area, suggested parking rates as outlined in Table 3.4.

Table 3.4: Suggested Parking Rates for City of Cockburn

Land Use	Parking Requirement (minimum)
Residential	a) 1 car space for one or two bedroom dwellings; and b) 2 car spaces for three (or more) bedroom dwellings
Retail (where the built form does not facilitate an easy transition to Office uses)	1 spaces per 25m ² GFA

Land Use	Parking Requirement (minimum)
Office (where the built form does not facilitate an easy transition to Retail uses)	1 spaces per 40m ²
Mixed Use (where the built form facilitates alternative opportunities for Office and Retail uses)	1 space per 33m ² GFA

3.2.3 Sydney

The Sydney Local Environment Plan (LEP) introduced by the NSW State Government recognises that the continued attraction of private vehicles for commuting to Central Sydney is inconsistent with the City's sustainable development objectives. The objectives of the Plan state that public transport is the most important and efficient travel mode in the Central City, and seek to discourage adverse urban design, improve pedestrian amenity and attractiveness, and promote residential and commercial development. The Plan introduced parking provisions that seek to manage demand for private vehicles, disincentivise commuter car parking and improve street amenity for pedestrians and active transport users, while still providing reasonable and accessible parking resources for local business and residents. Some specific provisions, as they are relevant to Maroochydore, are discussed below.

Removal of Minimum Parking Requirements

The City of Sydney was on the front foot in Australia in the adoption of maximum parking rates in 1996 in the Central Sydney Local Environmental Plan. The maximum rates expressed in the LEP are outlined in Table 3.5.

Table 3.5: Central Sydney LEP 1996 Maximum Parking Rates

Land Use	Maximum Parking
Dwelling House	2 spaces/dwelling
Studio	0.25 spaces/dwelling
1 bedroom apartment	0.5 spaces/dwelling
2 bedroom apartment	1 space/dwelling
3 or more bedroom apartment	2 spaces/dwelling
Hotels	0.2 spaces/room

The City of Sydney Development Control Plan (DCP) and LEP were updated in 2012 with maximum further reduced and refined from 1996 levels. The LEP outlines maximum car parking requirements for residential, retail and commercial uses and is based on sites proximity to public transport and general services and facilities. Areas are classified as either zone A, B or C depending on the proximity to public transport (Category A being within the immediate vicinity of public transport and Category C being on the edge of the walkable catchment to public transport services). Table 3.6 outlines the maximum parking requirements outlined in Sydney LEP 2012.

Table 3.6: Central Sydney LEP 2012 Maximum Parking Rates

Land Use	Maximum - Category A	Maximum - Category B	Maximum - Category C
Dwelling House	1 space/dwelling	2 spaces/dwelling (>2 bed) 1 space/dwelling (up to 2 bed)	2 spaces/dwelling
Studio	0.1 spaces/dwelling	0.2 spaces/dwelling	0.4 spaces/dwelling
1 bedroom apartment	0.3 spaces/dwelling	0.4 spaces/dwelling	0.5 spaces/dwelling
2 bedroom apartment	0.7 space/dwelling	0.8 space/dwelling	1 space/dwelling
3 or more bedroom apartment	1 space/dwelling	1.1 spaces/dwelling	1.2 spaces/dwelling
Hotels	0.25 spaces/room (up to 100 bedrooms) 0.2 spaces/room (greater than 100 bedrooms)		

Implementing a Parking Space Levy

The LEP introduced a parking space levy (PSL) which applies to marked, unmarked and stacked off-street spaces in Sydney's City Centre, and town centres such as Bondi Junction, Chatswood, Parramatta, and St Leonards. Motorcycles, residential vehicles, mobility impaired spaces, and commercial service vehicles, are exempt. The objective of the levy is to discourage car use by increasing the direct cost of parking, with the resulting revenue used to directly fund public transport improvements, including the Liverpool-Parramatta transitway.

The PSL is currently set at \$2,000 per space per year in the City Centre, and raises approximately \$100 million per year for public transit and public improvements; in other centres the PSL is reduced to \$710 per space per year. These rates are reviewed every financial year, providing flexibility for the NSW government to assess the impacts of the PSL.

The PSL does not appear to have directly resulted in broader changes in transport behaviour. This does not necessarily undermine the value of the PSL, but it does highlight the long time frames over which the impacts of parking reforms can manifest. The City PSL, for example, was introduced in 1992 at a rate of only \$800 per space per year. This initial cost of the PSL may have been sufficiently small to be absorbed within general operating expenses, rather than being passed directly to users, and is thus unlikely to have had an impact on travel behaviour. More recent increases in the PSL would need to be monitored to see whether an elastic response in private vehicle use has eventuated.

Lessons for Maroochydore

Although the Sydney and Maroochydore urban landscapes are seemingly disparate, a number of elements from Sydney's experience in parking reform are prescient:

- Removing minimum parking requirements is an essential first step to support the development of high quality public transport. Higher density development and economic activity that support public transport, walking and cycling in cities such as Sydney exist as direct result of not having minimum parking requirements, both historically and within current planning policies. The removal of minimums will and must compliment the introduction of rapid transit.
- The introduction of parking space levies can be a useful tool for achieving dual, complementary outcomes – directly charging the users of parking resources to allow them to make informed decisions about their travel choices, and provides a funding source to increase the efficiency and attractiveness of more sustainable public transport nodes.
- It is important for levies and charges to be responsive to both demand, and the surrounding land uses. The ability of the NSW Government to alter the PSL over time and in different areas, allows it to be used as an effective, flexible travel demand management tool, to achieve transport outcomes.

3.2.4 Melbourne

In 2010, Melbourne introduced a maximum parking requirement of 1 space/dwelling for residential developments over four storeys in inner city areas that are well served with public transport. Previously onerous minimum requirements required 2 spaces per dwelling.

A minimum rate still applies to developments below four storeys, however reductions may be granted. For residential developments below four storeys and other land uses which stipulate minimums, reductions may be granted (including to zero) when consideration is given to the following:

- The car parking demand likely to be generated by the use.
- Whether it is appropriate to allow fewer spaces to be provided than the number likely to be generated by the use.



An assessment is generally required to be undertaken to estimate parking requirements when reductions are sought. These assessments are to consider the following:

- Multi-purpose trips within an area.
- The variation of car parking demand over time.
- The short-stay and long-stay car parking demand.
- The availability of public transport in the locality.
- The convenience of pedestrian and cyclist access to the site.
- The provision of bicycle parking and end of trip facilities for cyclists.
- The anticipated car ownership rates of likely or proposed occupants (residents or employees).

Similar to Sydney, Melbourne has also implemented a 'congestion levy' on car-parks within the CBD and Docklands area. The majority of land-uses pay \$800 per car-park per year with concessions available for spaces that are not available for long-stay parking. Revenues from the congestion levy are tagged to fund transport projects across the city.

The CBD and Docklands Parking Plan 2008-2013 completed by the City of Melbourne studied parking policy outcomes in the CBD and adjacent Docklands precinct. The study identified a total of 50,000 off-street parking spaces in the CBD, and recognised the relationship between maximum parking ratios specified in the planning scheme and the emergence of a market for parking resources within the CBD and Docklands, particularly through the re-allocation of under-utilised commercial (commuter parking) to residential users:

"With many new residential buildings applying for less than one space per dwelling, the trend with residential developments in the CBD has been for the amount of car parking as part of the development to be reduced. The signals are mixed though because a market in car spaces in commercial car parks has also emerged with residents hiring spaces allocated to commercial parking. For example, in the Paramount development, there is a 400 space car park which has been sub-divided into individual car space lots and they have been sold on the open market and some bought by owners of residential units. These arrangements will continue to be supported by the City of Melbourne because they involve taking a commercial space presumably used by a commuter and converting to a residential space which is more likely to be used in non-peak periods.

Some of the reductions in CBD resident car use may be because many CBD residents don't require a car for commuting to work. This is supported by Journey to Work data where of 6,165 CBD residents who owned a car, 830 drove to work while 2,762 walked to work. Many residents in the CBD still own a car as a form of transport to undertake activities outside the CBD."

However, it was also noted that over the last 15 years approximately 15,000 new off-street spaces have been provided via approval granted by the Victorian Government on the grounds of state significance. This has contributed to a perception that planning requirements are easy to circumvent for 'special purposes' and somewhat created an over-supply of car-parking, which is often filled by discounted commuter parking.

Lessons for Maroochydore

In general, off-street parking arrangements in Melbourne appear to be broadly similar to Sydney. It is emerging that the combination of initiatives has, to varying degrees, reduced the over-supply of under-priced off-street parking and thereby stimulated the emergence of a market for parking resources. Despite these measures, commercial parking operators still consider there to be an over-supply of parking. Nonetheless, some important points emerge for consideration in Maroochydore:

- Parking maximums, as replacements for minimum parking requirements, must be applied fairly and consistently, without concession or waivers or special conditions, in order to have the desired effect on commuter parking supply and sustainable mode shift.
- Congestion levies (parking space levies) need to be set at a level that provides, in the first instance, a tool for managing travel demand. While Melbourne City are receiving revenue from their congestion levy for transit and urban environment improvements, it is not apparent from their experience that their congestion levies are having significant effects on travel behavior.

3.2.5 Edinburgh

In 2009 the City of Edinburgh adopted new parking standards for the levels of parking permitted in new developments. Maximum parking standards were set based on a zone system, with differing rates reflecting the accessibility of the zone to public transport, including the light rail system that was then under construction (Edinburgh Trams began operation in May 2014). Some zones specify minimum standards to effectively provide an appropriate range for the supply of parking. A key feature of Edinburgh's parking standards is the flexibility in rates allowing reductions from minimum rates. Parking provision below minimum rates may be permitted for the following reasons:

- Parking provision is impossible on the site but the development is desirable for other reasons;
- Lower parking provision is required for reasons of townscape, air quality or transport impact; and
- The developer can justify lower provision through demand reduction measures while not causing unacceptable parking overspill.

An example of parking rates in Edinburgh is provided in Table 3.7. Rates for zones 1 and 2 as well as zone 5a have been provided to illustrate the range of rates for different locations (zone 1 is located in the CBD within close proximity to public transport and zone 5a is located on the periphery of the city but with a lower level of access to public transport).

Table 3.7: Edinburgh Parking Standards

Land Use		Zone 1 and 2	Zone 5a
Residential (3 bedroom apartment or house)	Min	0	0.75 spaces/dwelling
	Max	1 space/dwelling	1.5 spaces/dwelling
Office	Min	0	1/250m ² of GFA
	Max	1/500m ² of GFA	1/120m ² of GFA
Retail under 500m ²	Min	0	1/250m ² of GFA
	Max	1/100m ² of GFA	1/100m ² of GFA
Retail over 500m ²	Min	0	1/120m ² of GFA
	Max	1/70m ² of GFA	1/70m ² of GFA

3.2.6 North American Overview

A number of cities throughout North America have recognised that parking supply in locations well served by public transport often exceeds demand as a direct result of excessive parking minimums in preceding decades. Consequently, many towns and cities in North America have either reduced minimum requirements or implemented maximum parking rates, and vary their rates based on proximity to public transport.

Table 3.8 provides a summary of various North American cities, their parking rates, and other noteworthy features of their parking policies.

Table 3.8: North American Parking Rates

City	Minimum or Maximum	Parking Rate Example	Comments and other Features
Calgary, Alberta	Maximum and Minimums	<i>Residential</i> 1.25 – 1.5 spaces/dwelling (max) Parking rates sited specifically for area within 600m of existing or planned LRT station (rates vary depending on area – CBD, inner city or suburbs). <i>Retail and Commercial</i> 2/100m ² of GFA (min)	➤ 10% reduction of parking minimums for all other uses within 400m of LRT station. ➤ Every 6 bicycle spaces provided in excess of minimum bicycle parking standards reduces parking requirements by 1 space. ➤ Reduction of parking requirements where transport demand measures are proposed that are approved by the development authority and attached to conditions of approval.
Toronto, Ontario	Maximum	<i>Residential</i> 0.2 – 1.65 spaces per dwelling dependent upon the number of bedrooms and location.	➤ Parking requirements are based on geographic location and frequency of public transport services irrespective of mode.
Ottawa, Ontario	Maximum	<i>Residential</i> 1.5 – 1.75 spaces/dwelling <i>Retail</i> 1 – 2.7/100m ² of GFA <i>Commercial</i> 1 – 2.7/100m ² of GFA	➤ Parking rates cited for sites within 600m of rapid transit stations. Variations dependent upon area (divided into central area, inner city and suburban).
Los Angeles, California	Minimum	<i>Residential</i> 2 spaces/2 bed unit 1.5 spaces/1 bed unit <i>Office</i> 1 space/45m ² <i>Retail</i> 1 space/25m ²	Reductions in parking rates allowed in areas well served by public transport: ➤ 40% for residential ➤ 60% for retail and commercial ➤ Los Angeles is currently introducing more flexible parking standards to reflect the unique nature of different locations including possibility for maximum rates.
City of Vancouver, British Columbia	Minimum and maximum	<i>Residential Permanent</i> Max 0.7/dwelling <i>Residential Short Term</i> Min 0.3 spaces/room Max 0.5 spaces/room <i>Office</i> Min 1 space/70m ² Max 1 space/45m ²	➤ In the CBD parking maximums are <u>not</u> to be exceeded. ➤ Outside of downtown areas 20% reduction below specified minimums allowed for locations within close proximity of public transport.
Mountain View, California	Minimum	<i>Residential</i> 1 to 2 spaces/dwelling dependant on number of bedrooms <i>Office</i> 1 space/30m ² of GFA	➤ Sites located in the “T” zone that are within 650m of transit have parking requirements reduced by 20% below specified minimums. ➤ Further reductions allowed were shared parking arrangements are established.

3.2.6.1 San Diego

San Diego, California has recently undertaken a parking study specifically investigating parking rates for developments well served by public transport. The study involved the review of parking utilisation in existing developments well served by public transport, and recommended lower parking rates and accompanying parking management strategies.

Table 3.9 outlines the rates recommended in San Diego and the percentage reduction from standard rates. Note that rates are minimum rates and the rates for office and retail are based on Gross Leasable Floor Area (GLFA).

Table 3.9: San Diego – Suggested Parking Rates for Locations Well Served by Public Transport

Land Use	Suggested Parking Rate	Reduction from Standard Rates
Residential	1.25 spaces/dwelling	0-50% dependant on location
Office	2.9 spaces/100m ² of GLFA	12-20% dependant on location
Retail	3.6 spaces/100m ² of GLFA	0-10% dependant on location

Table 3.10 outlines suggested demand reduction measures and the corresponding reduction in parking rates.

Table 3.10: Parking Reductions in San Diego

Demand Reduction Measure	Further Parking Reduction
Shared Parking	10 – 20%
Public Transport Pass Program for Employees	5 – 20%
Priced Parking	5 – 20%
Unbundled Parking	5 – 10%
Car Sharing	2 – 5%

3.2.6.2 San Francisco

The San Francisco Municipality represents one of the more innovative examples of parking reform in recent times, provides a number of key lessons that can be applied to Maroochydore, and indeed other centres more broadly. This has been driven by investment in transit, gradual replacement of off-street parking minimum requirements, unbundling of parking, and proactive on-street parking management.

Off-Street Parking

Due to its low residential population and high number of commuters, the city introduced many of its parking reforms downtown. In 1973, the city authorized a cap of all downtown commuter parking spaces. Minimums no longer apply to any use downtown, and a maximum of one space is permitted for every four downtown residential units. Similarly, parking may occupy no more than 7% of an office building's gross floor area. San Francisco has also gradually eliminated residential minimum parking requirements through the adoption of neighbourhood plans for districts close to the downtown. Recent developments subject to residential parking maximums demonstrate that the maximums are having a binding effect, with most developers building up to the maximum allowed number of spaces. The city's residential parking maximums range from 0.5 to one space per unit, depending on neighbourhood factors such as access to transit and density. These rates were often converted from the existing minimum requirements.

Unbundling

The 2008, San Francisco mandated that developers unbundle parking spaces from residential units and dedicate parking spaces to car share and covered bicycle parking in larger residential developments throughout the city.

Enforcement of parking unbundling is difficult and some developers have sought to circumvent the requirements by legally unbundling the sale of a parking space from the residential unit but pricing the space well below market rate (e.g. \$100) to the buyer of a residential unit. The token sum leaves parking nearly free, thus essentially bundled, but in compliance with the letter of the law. When parking spaces are unbundled, assessing the land they occupy has proven difficult. This is particularly the case when unbundled parking spaces are not independently accessible, such as when car parking spaces are stacked.

The city is considering parking reforms at the neighbourhood scale, such as eliminating minimum parking requirements. The San Francisco Municipal Transportation Agency (SFMTA) is currently studying unbundling

commercial parking from leases and adjusting the city's development congestion impact fees to reflect a development's proposed number of parking spaces rather than units.

On-Street Parking

San Francisco's *SFpark* is the largest on-street parking reform project underway in the United States, encompassing 6,000 of San Francisco's 25,000 metered on-street parking spots in seven pilot neighbourhoods. San Francisco installed new electronic, multi-space meters and activated parking spot sensors attached to the pavement, which began operation in 2011. These wireless sensors detect whether a spot is occupied by a vehicle, and centrally report parking occupancy information in real time. The project produces data about the effect of meter pricing on occupancy, and will use pricing to redistribute the demand for parking. The goal is to encourage drivers to park in dedicated parking facilities, and to have at least one space available on every metered block. Thus with more availability, drivers will circulate less, reducing congestion and increasing the efficiency of buses using the same routes. It is intended that *SFpark* will change public attitudes towards metering through positive examples, and by providing better information and better customer service. It is expected that *SFpark* will foster public support for an on-street parking system based on broader transportation goals rather than local politics. Data collected provides real time information on turnover, length of stay, failure to pay and other illegal parking allowing the city to precisely and more effectively deploy enforcement personnel, and introduce pricing that is responsive to demand.

Lessons for Maroochydore

San Francisco is at the forefront of parking reform, and enjoys a particularly favourable political and demographic environment for introducing otherwise sensitive parking management measures. However a number of features of the reforms introduced in San Francisco are equally applicable to Maroochydore:

- Off-street parking reforms have been introduced on the neighbourhood scale, beginning with the CBD area, and sequentially in other neighbourhoods, allowing for transit oriented development to occur at important transit corridors and nodes. The removal of minimum parking requirements and the introduction of unbundling has occurred concurrently with, and provided significant demand for, public transit improvements, particularly for commuters and those would normally park for significant periods of the day. These examples underpin the importance of integrating parking reform with transit improvements and promoting transit oriented land-use.
- On-street parking reform has been highly successful due to the emphasis placed on fast, efficient and convenient payment technologies. Despite relatively high prices for on-street parking in some parts of the San Francisco Municipality, users have experienced high levels of customer service and value for money. Additionally, the use of new metering technologies allows authorities to gain valuable information about demand for parking resources, which should be used to set the prices to manage that demand.

3.2.6.3 Portland

Portland provides an illustrative case study for effective parking reform. Parking reform began in 1972 in response to unacceptably high levels of air pollutants. This led to a supply freeze at 45,000 parking spaces. Since 1992, the state of Oregon has mandated that all localities guide their development with transit accessibility goals. The Portland region set the goal of reducing parking spaces per capita by 10 percent over a 20 year period. The outcomes include improved air quality, increased transit ridership, and improved urban form. In 1997, the city lifted the 1972 parking freeze, replacing it with a more flexible system of parking maximums and minimums to manage, rather than prevent, parking space construction.

Parking minimums have been removed in the city's densest commercial neighbourhoods, including downtown and central residential districts. Similarly, minimums have been removed from all sites within 500 feet of a transit line that provides service at least every 20 minutes during peak hours, favouring transit-oriented development in these areas.

A developer or owner also benefits from reduced minimums if willing to manage parking by arranging space sharing or bike parking in a facility. When the parking demands from two or more uses located near one another occur at different times, the city's zoning code allows a shared parking facility with fewer spaces than the combined, separate requirements for each use. Similarly, bicycle parking may substitute up to 25 percent of required car parking spaces, with the discharge of one car park for every five bicycle parks provided.

Parking maximums complement minimums in many neighbourhoods. The city conducted a study to determine parking demand under different policy scenarios. Taking account of transit capacity, they calibrated parking requirements to meet travel demand forecasts within the context of the entire transportation system and their land use objectives. Consistent with the city and state's commitment to public transit, maximums vary according to a site's distance from bus or light rail. Several neighbourhoods are therefore subject to low maximums. Downtown office and retail developments are limited to one space per 1,000 square feet of floor space, and hotels may provide only one space per hotel room. Given this low limit, developers almost always build up to the maximum; no waivers to build above the maximum have been granted since 1974.

A developer choosing to build below the maximum may transfer its parking development rights to another property. In this model a developer may transfer (but not sell) parking rights up to the maximum allowed to another developer as long as the transfer agreement has been completed prior to the laying of the new development's foundation. For pre-existing buildings or for new development where a transfer agreement had not been made prior to the foundation laying the existing building may transfer up to 70 percent of the original entitlement to another developer. In return, the transferring property has the right to use its parking entitlement in the facility where the rights have been transferred but they must pay for its use.

This policy maintains city control over a district's parking supply yet allows developers the flexibility necessary to finance, build and operate new and existing developments. It also helps to consolidate facilities, reducing the number of curb cuts and intrusions into the pedestrian realm.

The impact of this group of programs and policies has been significant. The city reports that transit use increased from 20 to 25 percent in the early 1970s and to 48 percent in the mid-1990s.

Lessons for Maroochydore

Portland's extensive experience with parking reform provides a number of useful points that are equally applicable to Maroochydore:

- The removal of minimum parking requirements, and in some cases the introduction of parking maximums, has focussed predominantly on areas with a strong transit focus. This highlights the role that parking supply has integrating land use and development types with the transport network. At the very least, the removal of parking minimums should focus on areas where land is a scarce resource (such as town centres and CBDs), and where the developments can be transit-oriented, around key passenger- and active-transport corridors.
- Parking reforms in Portland have focussed on flexibility; the ability of developers to transfer parking allowances to other developers and land uses allows for the consolidation of parking supply (reduced fragmentation), augmenting good urban form and pedestrian amenity. Additionally the ability of developers to discharge their minimum parking requirements in exchange for the integration of active transport infrastructure, or to share their parking supply with surrounding, complementary land uses, provides for greater flexibility in the provision of parking, and promotes sustainable transport choices and more efficient urban form.
- Parking prices in Portland remain lower than many other large cities, suggesting they have not taken parking reform as far as they should to achieve more market based pricing; because of this, despite heavy improvements to public transport, Portland's public transport mode share has not improved at the broader metropolitan level.

3.2.7 New Zealand

Table 3.11 compares minimum parking requirements in New Zealand cities, highlighting that many cities in New Zealand are moving towards a demand management approach to parking, and are proposing to remove or reduce minimum parking requirements.

Table 3.11: Developments in Parking Policies in New Zealand Cities

City and Population (2006 Census)	Parking Policies
<i>Auckland¹ [428,300]</i>	Council removed minimums and implemented maximum parking requirements in the CBD in 1996. The limit on parking is set by the road hierarchy: Type 1: 0 car-parks (i.e. no car-parking is allowed); Type 2: 1 car-park per 200m ² GFA; Type 3: 1 car-park per 150m ² GFA; Type 4: 1 car-park per 105m ² GFA; Type 5: Outlined in the Wynyard Quarter Plan
<i>Wellington [187,000]</i>	Council has removed minimum parking requirements and applied parking maximums in both the CBD and in suburban centres. These limits are: CBD – maximum ratio of 1 car-park per 200m ² and site cap of 70 car-parks for new developments; and Suburban centres – site cap of 120 car-parks for new developments
<i>Hamilton [134,400]</i>	Council is currently considering the removal of minimum parking requirements in the CBD. In-lieu payments can be made for parking shortfalls in the central city.
<i>Tauranga [106,700]</i>	Council is currently reviewing approaches to CBD public parking management. Minimum parking requirements are currently in place but are proposed to be removed.
<i>Palmerston North [81,600]</i>	Palmerston North City Council has proposed the removal of minimum parking requirements in the inner CBD (Inner Business Zone) to be replaced with maximums. ²
<i>Rotorua [68,000]</i>	Council has proposed completely removing its minimum parking requirements within the CBD in its District Plan Review (Draft for Consultation).
<i>Nelson [59,8000]</i>	Nelson City has proposed parking maximums in the Inner City Area (Proposed Plan Change 21) and reductions in requirements in all other areas. They have also proposed design guidelines to ensure parking does not compromise urban design and heritage objectives. ³

¹ Auckland City Council (ACC) is now part of Auckland Council. The ACC district plan will remain operative until an Auckland Council Unitary Plan is developed.

² <http://www.pncc.govt.nz/YourCouncil/CouncilActivities/PublicConsultation/Detail.aspx?id=136101>

³ <http://www.nelsoncitycouncil.co.nz/proposed-plan-change-21/>

4 Demand Management

In order to support reduced parking in development proposals, accompanying demand reduction measures are often required in many cities and towns. Specific reductions are generally not cited for individual demand reduction measures, however possible reductions typically range from 5% to 20% of the required number of car spaces. To gain a greater understanding of the potential impact different demand reduction measures have on parking demand research undertaken by Todd Littman from the Victorian Transport Policy Institute has been reviewed. The typical reduction in car parking requirements for different demand reduction measures is provided in Table 4.1.

Table 4.1: Demand Reduction Measures Impact on Parking Demand

Demand Reduction Measure	Parking Reduction
In-lieu Payments	-
Maximum Parking Rates	-
Shared Parking	10% - 30%
Priced Parking	10% - 30%
Unbundled Parking	10% - 30%
Provision of bicycle facilities	5% - 15%
Improved User Information	5% - 15%
Financial Incentives	5% - 15%

Common demand reduction measures are explained below.

4.1 Remove Minimum Parking Rates

Minimum parking rates have historically been enforced in order to support car travel based on the premise that individual developments should fully cater to forecast parking demands in self-contained on-site car parks. This approach however has had various the unintended consequences for urban areas. These consequences include urban sprawl, fragmented parking facilities, and artificially low costs for the use of private vehicles.

Removing minimum parking requirements allows developers the freedom to determine the marginal value of providing car-parks. In this way, the market is allowed to price out unnecessary demand and/or supply in favour of more efficient land uses.

One of the primary benefits of removing minimum parking requirements typically is accelerated levels of brownfield redevelopment on sites previously constrained by the need to provide on-site parking. Furthermore, removal of minimum parking requirements generally seeks to effect:

- The development of land which is currently used for parking into more productive activities, resulting in higher development densities; and
- The adaptive reuse of older buildings, particularly in town centres, where affordable residential accommodation, such as loft apartments, may be incorporated onto floors above ground level.

In Maroochydore's situation, which is essentially a greenfield development, the case for removing minimum parking rates becomes even stronger, as the opportunity exists to allow parking to be provided as the market requires from the outset, rather than gradually correct a statutorily required oversupply in parking and suboptimal use of land. Removing minimum parking requirements will allow car-parks to be provided as a consequence of development, rather than as a prerequisite, with the marginal benefit weighed up against the marginal costs of dedicating more

land to parking and constructing the parking facilities, ultimately resulting in less land being locked away unnecessarily for parking.

Perceived risks of removing minimum parking requirements tend to revolve around the fact that developments may under-estimate parking demands and exploit public and private parking resources that are available in the surrounding area. This perceived risk, however, is predicated on the following assumptions:

- Private and public providers of parking will not take steps to manage additional demand for parking resources created by new developments;
- That parking resources will continue to be paid for by developers and building owners, rather than users; and
- The occupiers of new development will not adjust travel patterns and demand for parking in response to the on-site parking scarcity.

These assumptions are questionable given that:

- Demand for parking is already managed, albeit inadequately, to ensure exploitation does not occur. This is typically through the application of prioritised parking controls and tow away areas in public and private areas respectively;
- Removing minimum parking requirements is expected to result in an increased value for parking, which will make it possible for parking facilities that will cover their own costs to be provided by the Council and/or a private operator; and
- Developments without on-site parking are likely to experience reduced vehicle mode share, recognising that the provision of parking has a significant impact on travel patterns (Booze Allen Hamilton, 2007).

4.2 Maximum Parking Rates

Limits on parking supply describe regulations designed to reduce the amount of parking that is provided with new developments. Limits on parking supply are typically justified through:

- Economic value - Minimum parking requirements have artificially lowered the perceived value of parking, creating a host of negative consequences, including urban sprawl and increased use of private vehicles. Limits on parking supply are a means to accelerate progress towards a more economically efficient parking supply.
- Strategic direction – State and local transport strategies support reduced dependence on single occupant vehicles. This reduced dependence is to be supported by the integration of transport and land use development, intensification around Passenger Transportation (PT) infrastructure, and improved walking and cycling facilities. Limits on parking supply support these objectives by identifying that current levels of vehicle use are highly unsustainable and likely to reduce in the future, particularly in areas where mixed use development and investment in alternative transport modes intersect, such as town centres and growth corridors; and
- Professional competency – professionals working in the field of transport planning are accustomed to working within minimum parking requirements that typically over-estimate the demand for parking. It is likely that the application of minimum parking requirements will continue to be applied unless the onus for conducting more sophisticated assessments of parking demands is placed, firstly, on developers, and, secondly, on professionals advising the developers.

There are a variety of ways to limit parking supply, including:

- Area caps – a maximum parking supply is set for a defined geographical area;
- Site caps – a maximum parking supply is set for individual developments; and

- Maximum ratios – a maximum ratio of parking supply to floor area is set for individual developments.

The area and site caps define the maximum number of car parks provided with an area and development respectively, whereas the maximum ratios prescribe the maximum proportion of parking relative to gross floor area. Limits on parking supply have been applied both within Australia and around the world, as shown in Table 4.2.

Table 4.2: Limits on Parking Supply: International Examples

Urban area	Relative size	Relative density	Limits on parking supply		
			Area caps	Site caps	Maximum ratios
Auckland	Large	High	-	-	✓
Wellington	Medium	High	-	✓	✓
Portland	Large	High	✓	-	✓
Scotland	Variable	Variable	-	-	✓
Brisbane	Variable	Variable	-	-	✓
Lacey, Washington	Small	Medium	-	-	✓

Some important features of the examples set out in Table 4.2 are:

- Auckland and Wellington have maximum ratios set at 1 car-park per 100m² and 200m² GFA respectively. This equates to approximately one space per 6.25 and 12.5 employees respectively;
- Wellington is the only urban area within this sample to apply site caps;
- Scotland has developed national planning policies for maximum parking ratios for commercial developments, which range from 1 car-park per 14m² to 30m² GFA;
- Portland is the only urban area within this sample which has applied area caps;
- Brisbane applies maximum parking ratios in both its defined central city area (at 1 car-park per 200m² GFA) and in suburban centres (at 1 car-park per 20m² GFA on the ground level and 1 car-park per 50m² GFA above ground level). Suburban centre parking maximums only apply to developments that are within 200m of a railway station or bus way station;
- All urban areas in this sample applied maximum ratios. Maximum ratios are by far the most common limits on parking supply.

In terms of site caps, Wellington City provides an example of where site caps are implemented in suburban centres. Policy 7.3.4 of the District Plan states:

"Any activity or the erection of buildings or structures involving the provision of more than 120 spaces per site is a Discretionary Activity (Restricted) in respect of: The generation of vehicular traffic."

This site cap applies irrespective of the land use being considered. A discretionary process is provided for those developments that wish to exceed the cap and can show that the adverse affects of traffic generated by the proposal are only minor. In addition to the generation of vehicular traffic, the provision of parking in excess of site caps could also require the developer to consider a multitude of factors and management strategies that may reduce the demand for parking.

Finally, of the examples provided above only Portland, Oregon was found to implement area caps on parking supply. In 1975 Portland set an area cap of 40,000 car-parks in its downtown area. This cap was increased in the 1980's

and 1990's. The transfer also allows for the transfer of unused parking entitlements, which creates an economic incentive to reduce the parking supplied with a particular development.

Previous discussion has highlighted the benefits that are expected to accrue from the implementation of limits on parking supply. Despite these benefits, it is acknowledged that the implementation of limits on parking supply may involve the following risks:

- Vehicle intensive development is encouraged to locate away from town centres and growth corridors and is therefore inaccessible by alternative transport modes (this may be interpreted as both a positive and a negative risk);
- The price of parking is inflated to the point where it compromises the competitiveness of the Maroochydore town centre and is prohibitive to those on low incomes.

It is recognised that exceeding maximum limits *may* be justified in rare cases, although the onus is always on the developer to investigate and implement certain parking strategies where practicable and cost-effective.

Exceptions to parking limits are not recommended for high trip generating developments, such as supermarkets, for the following reasons:

- Exceptions would increase the regulatory complexity of the strategy and open interpretative loopholes, which create opportunities for subverting the objectives of the strategy. So long as the discretionary process is transparent and robust, those developments which have high parking requirements should, with some detailed analysis, be able to prove their case for additional parking; and
- Specific strategies exist for managing parking demand associated with bulky goods stores, such as supermarkets and furniture retail outlets. These strategies include offering free home delivery to reduce travel and parking demands. The benefits of free delivery extend beyond reduced parking demand to potential congestion reduction benefits around retail areas.

In Maroochydore, given the greenfield nature of the town centre project, parking maximums also have an additional, or at least magnified, ability to control the mode of parking supply and balance between on-site and consolidated parking supply, whereby strict maximum parking rates are used to restrict inefficient off-street site specific parking supply and promote consolidated shared parking facilities. The benefits of shared parking and unbundled parking are discussed in the following sections.

4.3 Shared Parking

The mixed-use environment typical of town centres creates many opportunities to share parking between uses with complementary periods of peak operation. Shared parking facilities are a much more efficient way of providing parking, as they account for the different demand profiles of different uses across the day, allowing a smaller parking supply to be provided when peak periods of some uses correspond with off-peak periods of adjacent uses. There are no significant operating and management constraints to preclude the development of a shared parking facility. Town centres such as the Maroochydore City Centre, for reasons outside of parking policy, inevitably achieve a diverse and flexible mix of land use. In this environment, shared parking arrangements will be extremely beneficial, and it is considered imperative that this opportunity be fully capitalised upon.

The great advantage of shared parking facilities is that they are more efficient. Each space can be used more hours during the day, week or month. Table 4.3 demonstrates one example of utilisation rates for different land uses, based on experience in South East Queensland. It is important to note that the exact percentages given in the table vary significantly depending on the context; however, they provide a good demonstration of the opportunities and benefits of shared parking.

Beyond the benefits of shared parking relating to efficient use of spaces and reduced supply, shared parking can also have huge positive impacts on urban forms. When the reasoning behind shared parking is applied in order to provide consolidated parking facilities instead of numerous small off-street surface car parks, this allows a much denser, walkable and ultimately prosperous urban form to develop. This is because the urban form will no longer be punctuated by regular provisions of dead space created by the swathes of concrete and driveways that site-specific surface parking requires. By exploiting the opportunities for shared parking, a much more compact, lively and prosperous city centre can be achieved in Maroochydore. Parking maximums can also be used to support the development of consolidated shared parking by constraining on-site parking such that any additional parking provision must be provided in consolidated parking facilities.

Table 4.3: Example of Temporal Utilisation Rates; SE QLD (MRCagney)

Day	Time	Retail	Convenience Retail	Restaurant	Cinema	Residential	Office	Retail Showroom	Education
Mon – Wed	5am - 8am	5%	5%	5%	0%	100%	5%	5%	20%
	8am - 11am	40%	50%	10%	5%	60%	100%	30%	90%
	11am - 1pm	75%	80%	50%	20%	40%	90%	70%	100%
	1pm - 5pm	80%	100%	15%	30%	40%	100%	80%	100%
	5pm - 8pm	30%	100%	80%	90%	75%	30%	30%	70%
	8pm - 12am	5%	20%	20%	50%	90%	5%	10%	20%
	12am - 5am	0%	10%	5%	5%	100%	0%	0%	0%
Thurs	5am - 8am	5%	5%	5%	0%	100%	5%	5%	20%
	8am - 11am	60%	60%	10%	5%	60%	100%	50%	90%
	11am - 1pm	95%	100%	50%	20%	40%	95%	70%	100%
	1pm - 5pm	90%	100%	20%	20%	40%	100%	90%	100%
	5pm - 8pm	95%	100%	80%	70%	75%	30%	95%	70%
	8pm - 12am	30%	15%	20%	40%	95%	5%	30%	20%
	12am - 5am	0%	5%	0%	0%	100%	0%	0%	0%
Friday	5am - 8am	5%	5%	5%	0%	100%	5%	5%	15%
	8am - 11am	40%	60%	10%	5%	60%	100%	50%	90%
	11am - 1pm	85%	100%	50%	20%	40%	90%	70%	100%
	1pm - 5pm	80%	100%	25%	30%	40%	100%	90%	100%
	5pm - 8pm	30%	100%	90%	90%	75%	30%	30%	60%
	8pm - 12am	5%	15%	50%	100%	90%	5%	10%	10%
	12am - 5am	0%	10%	10%	5%	100%	0%	0%	0%
Sat	5am - 8am	5%	5%	0%	0%	100%	0%	10%	5%
	8am - 11am	60%	60%	40%	10%	80%	5%	70%	10%
	11am - 1pm	100%	100%	90%	40%	65%	5%	100%	20%
	1pm - 5pm	95%	100%	25%	60%	75%	5%	95%	20%
	5pm - 8pm	20%	40%	100%	90%	90%	0%	20%	10%
	8pm - 12am	0%	15%	50%	100%	95%	0%	0%	0%
	12am - 5am	0%	5%	10%	5%	100%	0%	0%	0%
Sun	5am - 8am	5%	5%	0%	0%	100%	0%	10%	0%
	8am - 11am	50%	60%	40%	10%	80%	5%	70%	5%
	11am - 1pm	90%	80%	80%	40%	65%	5%	90%	10%
	1pm - 5pm	70%	80%	20%	60%	75%	5%	85%	10%
	5pm - 8pm	20%	40%	90%	75%	90%	0%	20%	5%
	8pm - 12am	0%	10%	10%	90%	95%	0%	0%	0%
	12am - 5am	0%	0%	0%	0%	100%	0%	0%	0%

*Note: Utilisation rates are percentage of peak demand as typically specified in parking scheme standards. These are an example only.

4.4 Unbundled Parking

Unbundled parking refers to the strategy of separating the costs of purchasing or leasing property, whether commercial or residential, from parking resources. That is, dwellings and tenancies are leased or purchased without associated parking spaces and spaces are purchased separately if required. For example, in a medium density residential development, dwellings may be purchased separately from the car-parks. This “unbundles” the cost of parking from the cost of living and supports the principle of consumer choice. Unbundled car-parks associated with residential development in town centres can cost an additional 20-25% of the total purchase price of smaller dwellings (Litman, 2006). By bundling parking with property, this cost of parking is simply incorporated into the cost of goods, services and property, and prevents consumers from realising savings through behavioural change or consumer choice that reduces their demand for parking.

Unbundled parking is somewhat dependent on the availability of effective parking brokerage services so that in the event of a parking surplus (i.e. not all car-parks provided with a particular development are purchased) then the building owner or body corporate committee is able to lease the car-parks to other users. Opportunities for unbundling are therefore enhanced by the existence of a Comprehensive Local Area Parking Management Plan.

In Maroochydore, allowing and promoting unbundling parking is considered to be a crucial component of parking policy to support the principles espoused in this document, particularly in as much as it allows the true cost of parking to borne by users and provides greater freedom of choice to consumers which may be exercised to minimise such costs.

4.5 Time Limits and other Priority Controls

Priority controls set rules to ensure the efficient and equitable use of parking resources. These rules typically aim to govern the type of use, such as loading bays, mobility spaces, and taxi stands, and / or the length of stay, such as 1P, 2P, 3P, etc.

These controls typically reflect priorities associated with different types of vehicle traffic. A possible suitable ranking is shown below:

1. Deliveries and service vehicles (loading bays);
2. Vehicles used by people with disabilities (mobility spaces);
3. Buses and taxis (bus stops and taxi stands);
4. Customers (on-street parks);
5. Employees (off-street parks); and
6. Residents (on-street parks).

The ranking shown above lends itself to town centres and growth corridors, where the parking requirements of customers and employees are considered to be a higher priority than those of local residents.

Demand for public parking is often managed through the use of time limits. These limits are often seen as a way to increase turnover and discourage long-stay parking and to this end they are somewhat effective. On the downside, however, time limits constrain the types of activities that can be undertaken.

For example, limits of less than 1-2 hours are likely to discriminate against activities that require longer time to prepare and serve food, such as high-quality restaurants. Similarly, people looking to make major retail purchases may be discouraged. Time limits are also relatively expensive and ineffective to enforce because officers must mark and subsequently return to vehicles.

For these reasons time limits are a “second best” parking solution that is appropriate only in those situations where prices are unlikely to be effective. Such situations might include areas where the implementation of pricing would simply shift demand elsewhere, leaving Council having to pay for the costs of installing meters for no financial gain. In almost all other situations, priced parking is preferred.

Priced parking (also called user pay and metered parking) refers to direct charges for using a parking space. Priced parking provides numerous benefits including increased turnover and therefore improved user convenience, reduced traffic problems, and increased revenues. Prices should be demand responsive and ensure that car-parks are well-used but not over-saturated.

The benefits of priced parking are discussed further in the section below.

4.6 Pricing

Priced parking is recognised to be an extremely effective demand reduction measure. The advantage of pricing is that it provides for high priority customers while discouraging the inefficient use of convenient parking resources by long stay users such as commuters. Priced parking is most appropriately implemented in areas experiencing more than 85% maximum occupancy as mechanism for managing demand. The price level set will thus aim to keep occupancy levels high, but not saturated, resulting in a situation where a few car-parks are almost always available for those who are willing to pay for them.

Parking pricing (also called user pay and metered parking) refers to direct charges for using a parking space. Efficient parking pricing can provide numerous benefits including increased turnover and therefore improved user convenience, parking facility cost savings, reduced traffic problems, and increased revenues. (Litman, 2010)

Shoup (2005) provides the following guidelines for efficient parking pricing:

- Price parking for full cost recovery: at a minimum, all costs of building and operating parking facilities should be recovered from users. Prices may be higher to reflect the opportunity cost of land and to provide profits.
- Price the most convenient parking, such as on-street spaces, so occupancy averages 85-90%. This increases the ability of people to find a park (about one available space each city block) and reduces circulating traffic. Use variable fees, with higher rates during peak periods and lower rates during off-peak periods.
- Dedicate some or all of the revenue from on-street parking to benefit local businesses and residents. Allow business associations and other community groups to participate in the decision-making about what revenue is spent on.
- Unbundle parking from building rents, so occupants only pay for the number of parking spaces they want.
- Allow private developers and building managers to decide how much parking to provide at each destination, rather than implementing rigid minimum parking requirements.

The price elasticity of vehicle trips with respect to parking price is typically -0.1 to -0.3 (a 10% increase in parking fees reduces vehicle trips by 1-3%), depending on conditions (Vaca and Kuzmyak, 2005; Litman 2008,). In the short run, cost-recovery parking pricing (fees set to recover full parking facility costs) typically reduces the number of spaces needed to serve a destination by 10-30%. For example, if parking is unpriced, 100 employees typically demand about 90 parking spaces, but cost recovery pricing can reduce this to 70 spaces. Larger reductions are possible if implemented with other management strategies, such as pricing with improvements to alternative modes and more sharing of parking facilities. (Litman, 2010)

Where priced parking is implemented, those discouraged from travelling by single occupant vehicle (in the main) may respond in a variety of ways, as indicated in Table 4.4.

Table 4.4: Short Term and Long Term Response to Priced Parking

Short term	Long term
Car-pooling	Move home or work to be more accessible to town centre by alternative modes.
Switch to alternative mode	
Travel outside of peak times	
Link trips with other errands	
Trip avoidance	
Trip diverted to alternative location	

It is important to emphasise that these responses are not necessarily constant over time. In many instances the short-term impacts of those who are discouraged from visiting the commercial centre reduces over time as new behavioural patterns emerge. These delayed adjustments can be as simple as allowing time for people to familiarise themselves with public transport (PT) timetables or coordinate car-pooling. For this reason, the number of people discouraged from visiting the shops due to parking prices may reduce over time.

While pricing is considered to be an effective and equitable parking strategy, there are some risks that will require careful management. The major risk is that people will be discouraged from visiting locations with priced parking and instead elect to travel to another location. While this may occur, the analysis above indicates that this response is only one of many available to individual visitors. Should pricing be applied consistently across the greater Maroochydore area and indeed the Sunshine Coast, then the risks of people being discouraged from visiting reduce significantly.

4.7 Payment Technology

Modern parking machines are likely to save more money on collection costs in all but the most low turnover sites. By providing detailed information on parking revenues they will also, over time, reduce the need for on the ground surveys. The convenience for users of modern parking machines is paramount, as it is often not the financial price of parking, but the inconvenience that people most object to. Modern machines provide the following key advantages:

- More convenient payment mechanisms: Many machines now provide change as well as accepting payment by notes, credit card, and mobile phone.
- Advanced communications: Machines communicate wirelessly and identify when they are full of coins or requiring maintenance.
- Detailed information: Modern machines record detailed information on each transaction.
- Fewer machines: One machine serves several car-parks, reducing obstacles on the footpath and collection costs for Council.

4.8 Car-Share Organisations

Car-sharing organisations are based around the management of a pool of vehicles parked at numerous locations around a community. Members of the organisation are able to book vehicles online and then gain access to the vehicles via electronic swipe cards. One car-share vehicle is typically utilised by a large number of people, thereby distributing the costs of car-ownership, such as maintenance and parking, across a larger number of people. Membership to a car-share organisation is considered most attractive to households that do not rely on vehicles for home-to-work commuting, or small to medium sized companies that do not need to manage their own fleet. In this

way, car-share vehicles are frequently used for commercial purposes during the day and residential needs during off-peak hours.

Numerous studies have indicated that members of car-sharing organisations reduce their driving and switch to higher rates of walking, cycling, and PT. This is likely due to the fact that the perceived per trip cost for privately owned vehicles is low, as the upfront costs (purchase price, registration, insurance, etc) are not considered in per trip terms, however car share schemes effectively charge all costs in per trip terms. As such, the real cost of vehicle trips is more apparent to car share users who are therefore more likely to avoid costly car trips.

By sharing vehicles, car-sharing organisations may reduce demand for residential and commercial parking by 5 – 10% (Litman, 2006a). The emergence of commercial car-sharing organisations in South-East Queensland is thus considered to strengthen the case for unbundling and reducing the parking supplied for medium density housing and commercial centres near major public transport routes. On this basis, the Maroochydore City Centre is an ideal location to promote and provide on and off-street spaces for car-share organisations.

4.9 Overflow Parking Plans

Overflow and spill-over parking plans seek to manage the effects of excessive parking demands, that may arise during special events and peak season, such as Christmas and Easter, or as a result of changes in parking management in adjacent areas.

These plans can help mitigate the potential negative effects associated with excessive parking demand, such as increased vehicle congestion; unsafe and/or illegal parking on streets, footpaths, and grass verges; and driver frustration.

Overflow parking plans should involve some of the following components:

- Signage to identify when parking areas are full, as well as to direct vehicles to alternative parking areas. This increases the utilisation of existing parking resources;
- Identification of appropriate temporary parking that may be shared, such as opening up parking at a local High School for the period immediately before Christmas when schools are out. This temporarily increases the supply of parking through identifying shared parking opportunities;
- Including the cost of PT passes in the ticket price for special events, such as sports and cultural events. This encourages the use of PT for travel to major events; and
- Retailer funded reimbursement of PT travel costs. This encourages the use of PT for travel during high retail seasons.

Residential parking schemes are a possible tool for managing the impacts of spill over and overflow parking in residential areas adjacent to town centres and growth corridors (in Maroochydore's case, outside of the city centre boundary). The scheme primarily involves the administration of a parking permit that exempts residents from parking regulations and pricing which may need to be implemented to discourage employees and visitors from exploiting residential on-street parking resources. Residential parking schemes may incur additional administration costs, which should ideally be recouped by annual fees paid by residents for the privilege of the parking permit.

It is recommended that resident parking schemes are viewed as an intermediary tool to aid the implementation of parking controls in areas where residents feel a historical attachment and/or property right in regard to on-street parking resources. This attachment, however irrational, is likely to be relatively strong in some instances.

For this reason, parking permits should be tightly controlled and only granted in situations where parking controls are shown to cause severe and irreconcilable disadvantage to individual residents. Moreover, parking permits should not be provided to residents who move into the area after the implementation of the scheme, which treats

the permit as a one non-transferable benefit that is tagged to a particular person. The number of permits can thus be expected to decline over time.

Therefore an overflow parking plan is a combination of strategies designed to efficiently accommodate peak parking demands without actually increasing the supply of parking, which would not be considered cost-effective for the few occasions of excessive parking demand.

4.10 Directional Signs and Automated Parking Management Systems

Directional signs provide real time information on the location and availability of parking resources. These signs should be placed on key access roads to inform drivers of the locations, availability, and the price associated with the parking facilities. This information allows drivers to identify the nearest available parking facilities and evaluate the relative value associated with different parking areas. The goal of directional signs is to reduce the distance travelled by vehicles looking for a car-park, thereby resulting in positive external benefits to other road users, as well as encouraging more efficient use of available resources. Signs can be quite simple or use more sophisticated automated systems that guide drivers directly to available parking spaces, as shown in Figure 4.1.

Figure 4.1: Automated Parking Management Systems (left, Robina) and Simple Directional (right, Brisbane)



Supplementing signs with a website and/or maps of available parking areas and pricing information is also helpful to increase familiarity and understanding of parking resource management for frequent visitors to the locality.

4.11 Green Travel Plans

Travel plans are a management tool designed to assist organisations and businesses reduce travel demands associated with both home-to-work and work based travel. They typically audit home-to-work and work based travel demands.

Travel plans help to address organisational issues affecting how people choose to travel, such as company cars and free parking. In many situations some changes may catalyse large reductions in vehicle use, including:

- Parking cash-out – provides commuters who normally receive free parking to take cash instead;
- Company car cash-out – as per parking cash-out except for company cars;
- PT passes - involves providing employees with a subsidised PT pass in place of a free car-park; and
- End of trip facilities for cyclists, including showers and lockers;

Travel plans thus support other parking strategies by undertaking a detailed assessment of the institutional barriers to shifting mode. It is important to realise, however, that the motivation for businesses to conduct travel plans is best provided by the accurate realisation of the costs associated with vehicle travel. For this reason, the use of

travel plans is expected to increase when the perceived value of parking reflects its underlying costs. Moreover, the removal of minimum parking requirements may encourage existing property owners to use travel plans to free up land to provide redevelopment opportunities.

4.12 Park and Ride

Park and Ride refers to the provision of parking at public transport stops and stations, thus encouraging people living in areas outside a walkable or cycle-able PT station catchment to drive to a nearby station and complete the remainder of their trip on public transport. Park and Ride works best in a very specific range of cases:

- A major concentrated commute destination with parking costs and/or significant congestion. Once a person has left their home by car, they need a strong reason to park and take PT. This reason is typically some combination of cost and time savings.
- Direct, frequent, and fast PT service from the P&R site to the commute destination. This service must be very good during the peak period. During the midday and evening, some service must be available so that there is a way to get back to the car if the customer must leave work late or early. In a limited range of cases, however, P&R is possible with peak-only express service, so long as some service, possibly a slower one, is available all day and evening.
- Land near a station that is inexpensive enough to use for parking. P&R requires abundant land at a low price. For these reasons, P&R should be located away from planned town centres, in places where there is good service but development is not considered desirable, such as areas affected by storm water issues or beneath high-voltage transmission lines. P&R may also be appropriate as an interim use, by developing a PT market in the area pending a level of development sufficient to support a more extensive connective bus system.

For these reasons, we recommend Park and Ride as a tool for lower-density suburban and rural areas. In higher-density areas, land is too expensive for Park and Ride to be an effective long-term use, though it may be appropriate as an interim use as an area is waiting to develop. On this basis, Park and Ride is not considered appropriate in the Maroochydore City Centre.

4.13 Cash in Lieu

In-lieu payments allow individual developments to offset the onsite provision of parking required by minimum parking standards by making payments to the Council. The cost to the developer is based on the size of the parking shortfall and the estimated cost to the Council of providing alternative parking.

In-lieu payments provide additional flexibility for developers to determine the relative costs and benefits of on-site parking. This flexibility is particularly beneficial in areas with relatively small property titles where the provision of access to on-site parking may be disproportionately expensive.

In-lieu payments have a number of practical risks and theoretical pitfalls, including:

- The council is expected to calculate the value of a car-park, which may or may not accurately reflect the present or future cost;
- Responsibility for the provision of parking is shifted from the developer to the Council, creating the potential for pressure to be exerted on the Council in terms of its management of parking resources;
- In-lieu payments go only part way towards creating a market for parking, where the developer is able to buy out on-site parking supply in the beginning without the opportunity of trading demand parking resources on an as needed basis; and

- Users are not directly charged for the costs of parking, violating the principles of economic neutrality and consumer choice. In-lieu payments perpetuate some aspects of the status quo, where the costs of parking are bundled into the costs of development and dispersed through the economy.

It is noted that an “in-lieu” parking policy is required only in the event that parking minimums are retained and the potential for a parking shortfall exists. Where the regulatory framework absolves developments from catering for parking demand, that is no minimum parking requirements apply, then the application of an “in-lieu” policy becomes redundant. As such, cash in lieu is not considered relevant to the Maroochydore City Centre.

Table 4.5: Summary of Strategies, Risks, Efficiency and Effectiveness

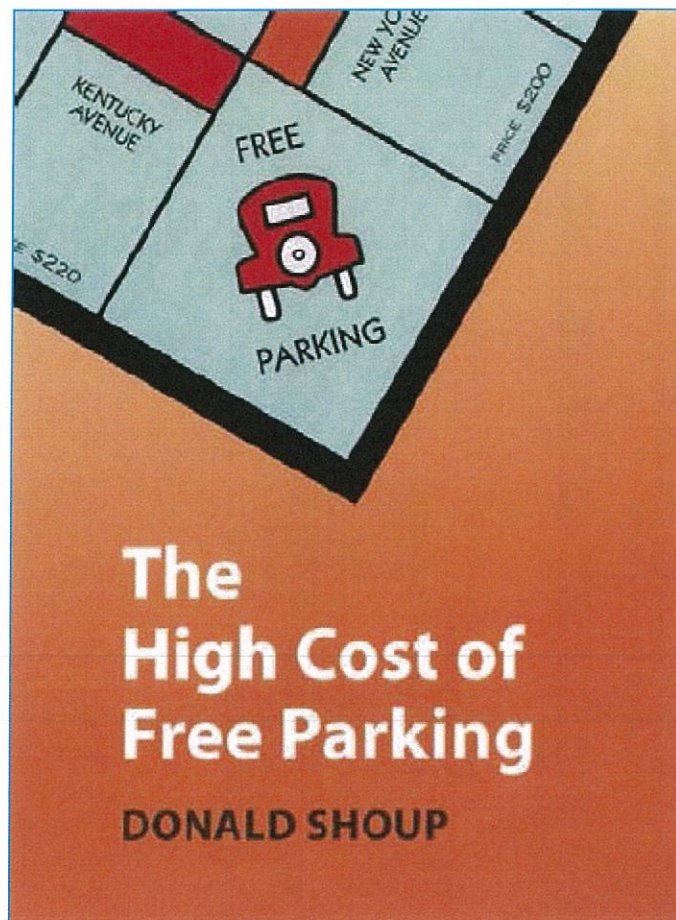
Level	Parking Strategy	Key features	Potential risks	Efficiency Benefits	Costs	Value	Effectiveness Short-term	Long-term
High	In-Lieu Payments	Provides market flexibility to opt out of on-site parking; Improves viability of redeveloping small sites.	Requires Council establish a value for parking that is low enough to be attractive but high enough to fund the provision of improved travel options; Shifts responsibility for the provision of parking from the developer to Council; Users are not directly charged for the cost of parking, violating the principles of economic neutrality and consumer choice; Symms the emergence of private parking operators and a more diverse market for parking; Preserves the need for methods to estimate minimum parking requirements; and Potentially places large administrative burden on Council.	Average	Low	Marginal	Marginal	Average
	Remove Minimums	Provides market flexibility to determine appropriate parking supply; No additional administrative burden for Council; Encourages sharing and unbundling; Facilitates redevelopment of existing sites.	Results in increase in demand for available parking supply (given the current over-supply of parking this is both a positive and a negative risk)	Extremely high	Extremely low	Very high	Average	Very high
	Maximum Parking Rates	Facilitates more rapid progress towards an efficient level of parking supply; Supports strategic objectives to reduce dependence on vehicles; Encourages more robust assessments of parking demands; Supports efficient operation of the local road network.	Encourages developments with high parking demands to relocate elsewhere.	High	Neutral	Average	Average	High
	Priority Parking	Provides for high priority users, such as service vehicles and mobility impaired; Encourages higher turnover of parking spaces.	Stringent parking controls may discourage high value visitors; Results in additional enforcement costs and higher rates of infringement notices, requiring a certain degree of punitive revenue gathering.	Medium	Low	Marginal	High	Marginal
	Priced Parking	Provides for higher priority users; Encourages higher turnover of parking spaces; Allows for flexible demand management; Charges cost of parking directly to user; Discourages long term visitors.	When implemented in isolation, prices may encourage a shift in clientele to other town centres, although this risk may be mitigated by coordinated local and regional implementation of priced parking.	Very high	Medium	Average	High	High
Management	Shared Parking	Encourages higher utilisation; Encourages reduced parking supply; Encourages improved urban form.	Requires Council input to implement, however this is less difficult in the greenfield Maroochydore City Centre case.	Medium	Low	Average	Average	Average
	Unbundled Parking	Reduces demand.	Difficult to implement from a Council perspective.	Medium	Low	Average	Marginal	High
	Overflow Parking Plans	Manages risks associated with high demand.	Few risks.	Medium	Low	Marginal	High	Marginal
	Directional Signs	Encourages higher utilisation; Reduced traffic impacts.	Management burden placed on Council; Requires passing installation and maintenance costs to developers.	Medium	Neutral	Average	Marginal	Average
Support	Car-Share	Removes need for individuals and business to have access to private vehicles; Reduces vehicle ownership leads to reduced demand for parking spaces.	Neutral – market oriented solution. There may be scope for encouraging car-share companies to establish, although the costs of this would be small.	High	Neutral	Very high	Marginal	Very high
	Green Travel Plans	Detailed audit of organisational travel patterns.	Neutral – market oriented solution.	Medium	Neutral	High	Average	Average

5 Key Research

5.1 General Studies

One of the most original and thorough critique of minimum parking requirements is Donald Shoup's 2005 book titled "The high cost of free parking". This book builds of earlier work by Shoup in the 1980s and 1990s.

Figure 5.1: "The High Cost of Free Parking", Donald Shoup (2005)



The arguments advanced by Shoup against minimum parking requirements can be summarised as follows:

- They assume that parking should always be free, and estimate demand accordingly. Minimums match supply to estimated demand for free parking, but as cities grow and intensify there are few reasons to support the presumption that parking would or should remain un-priced. This is true of on-street and off-street parking. Minimums are therefore based on the implicit but ultimately unreasonable assumption that parking should be free.
- They create an over-supply of parking that causes congestion. One of the key reasons advanced in favour of minimums is that they reduce localised congestion by reducing instances of drivers circulating an area searching for an unoccupied parking space. Shoup, however, points out that the over-supply of under-priced parking that occurs as a result of minimums will have the effect of increasing the supply of parking and lowering its costs, thereby stimulating vehicle travel (and congestion) that would not have otherwise eventuated.
- They require more parking to be supplied to meet a given level of demand. Requiring individual developments to meet their own parking demands is inefficient because it ignores opportunities to share

parking between nearby activities. In this way, minimum parking requirements actually act as a barrier to “entry” for smaller developers and give market power to large landowners, who are better placed to realise economies of scale from the provision of consolidated parking facilities.

- They create a fragmented and low density urban form. This criticism flows logically from the first three: By assuming that large amounts of parking should be provided on individual properties, minimum parking requirements results in multiple standalone car parks (often surface car parks) creating a fragmented, low density urban form. This undermines urban amenity and the relative attractiveness of other transport modes, especially walking.

Criticisms of minimum parking requirements can also be grouped in terms of their economic, social, and environmental impacts, namely:

- *Economic:* Minimums effectively act as an indirect tax on floor space, which in turn lowers land use density and provide a subsidy for vehicle ownership and travel. This contributes to a range of negative externalities, such as congestion.
- *Social:* Minimums take a transport cost and bundle it into the costs of land use development. In the case of residential developments, the costs of providing parking will be reflected in higher dwelling prices, and because vehicle ownership and travel tends to be positively correlated with income, a disproportionate share of the cost burden of minimums falls on low-income households.
- *Environmental:* Most of the outcomes described above, especially higher rates of vehicle ownership and travel, and larger areas of impermeable surfaces, tend to impact negatively on environmental outcomes. Air and water quality is undermined, especially in situations where parking promotes the outward expansion of urban areas into greenfield areas.

Conversely, no general studies that defend minimum parking requirements against these criticisms could be found. In fact, the only documents found that advance arguments in support of minimum parking requirements were council planning schemes. Given the large body of research highlighting their pitfalls, the lack of countering evidence in support of minimum parking requirements is considered rather notable.

5.2 Academic Literature

Aside from general studies discussed above there is a small body of academic literature that considers the economic impacts of minimum parking requirements. Some of the most relevant studies are summarised in the following sub-sections. As with previous sections, no academic literature that supported the retention of minimum parking requirements on economic grounds could be found.

5.2.1 Parking requirements and housing affordability: A case study of San Francisco

In this study Jia (1998) investigated the relationship between housing prices and the provision of off-street parking in San Francisco using a hedonic regression model of property prices. Results indicated that an off-street car park added approximately 10% to the cost of a residential property in San Francisco, where new residential developments are required to provide one car park per unit. The researchers conclude:

The results are statistically significant, robust, and dramatic. Housing affordability in San Francisco is directly affected by the requirements that parking spaces be provided along with housing units. Why is the requirement for a parking space bundled with housing? Why should each dwelling unit be required to have a fixed number of parking spaces regardless of the numbers of cars in the household? Would the public interest be better served if parking and housing were unbundled, creating separate markets for each?

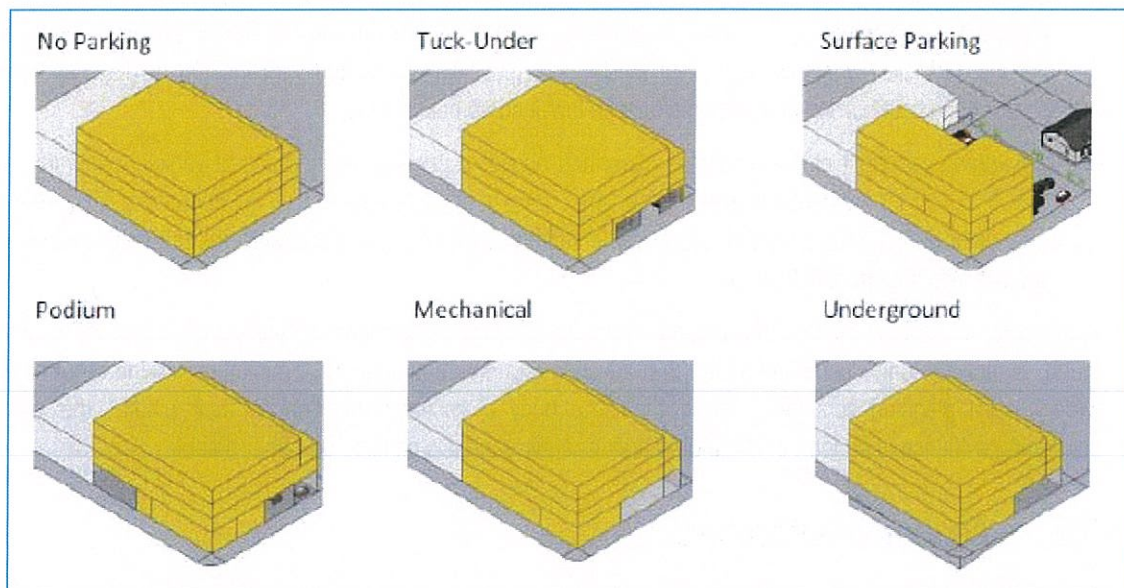
One of the more interesting parts of this study is the link drawn between the cost of parking and housing affordability. The authors estimate – using data on incomes and property prices – that 24% more households could afford to purchase their own homes in a situation where parking was not bundled into the costs of the development.

It is suspected that this estimate is over-stated, because it presumes that all households who currently rent for financial reasons would opt for cheaper dwellings without parking if they were available, when in reality some would not. Nonetheless, the point is instructive for providing something of an upper bound on the degree to which minimum parking requirements may suppress housing affordability.

5.2.2 Cost of Onsite Parking + Impacts on Affordability

The “*Bureau of Planning and Sustainability in Portland*” undertook this study into the costs of on-site parking and subsequent impacts on housing affordability. The study considered six different building prototypes, as illustrated in Figure 5.2.

Figure 5.2: The six parking prototypes considered in the study



The costs of these prototypes were analysed from a “ground-up” perspective – whereby the authors calculated the land and construction costs as well as the number of units and associated rental yields that would be required to deliver an appropriate return on investment.

The key relationship was that as more parking was provided, the construction costs tended to increase, whereas the number of units over which costs were able to be spread decreased. This economic “double whammy” means that even relatively low levels of on-site parking provision had large impacts on the rental yields required for the various prototypes to stack up.

For example, requiring the provision of 0.75 underground car-parks per unit would cause the rental yields required for the development to stack up to increase by USD \$500 per month, or 63%. Results suggest that in medium density settings even relatively “moderate” minimum parking requirements may have significant adverse impacts on housing affordability.

Figure 5.3: Impacts of on-site parking on required rental yields

Building Development Prototype	# of Units	# of Parking Spaces	Parking Spaces per Unit	7% ROI* Monthly Rent	10 % ROI* Monthly Rent
No Parking	50	0	0	\$800	\$1150
Tuck-Under	45	9	0.25	\$850	\$1200
Surface	30	19	0.6	\$1200	\$1800
Podium	42	22	0.5	\$950	\$1350
Mechanical	46	23	0.5	\$1175	\$1660
Underground	44	33	0.75	\$1300	\$1900

*Note: ROI= Return on Investment

5.2.3 Do parking requirements significantly increase the area dedicated to parking? A test of the effect of parking requirements in Los Angeles

In this study Cutter et al. (2010) test the hypothesis that minimum parking requirements cause an oversupply of parking by examining the value of space used for parking in Los Angeles. They develop a simple theoretical model to show that the implicit marginal value of parking (measured through property sales) should be equal to the cost of land plus the cost of parking construction.

The authors rely on a large property data set that contains transactions recorded over the period 1997-2005. They use a hedonic regression model to calculate implicit prices for a variety of property attributes, of which the area used for parking is one. Results from this model suggest:

- There is a positive value attached to the availability of parking in the surrounding vicinity; but
- The marginal value of parking is indeed considerably lower than the marginal value of land.

Stated differently, these results provide evidence to suggest that while the availability of parking has a positive impact on property values, this impact is smaller than potential alternative uses of that space. As such, requiring developers to provide parking will tend to reduce the value of a development.

The authors then conduct a direct parking regulation test. This involved comparing the level of parking provided with modern developments to the parking that would be required by the applicable minimums. They found little discernible difference between what was provided and what was required, which in turn suggests that minimum parking requirements were indeed “binding” for their data set.

The authors' conclusions are worth repeating in full:

Thus, if the goal of minimum parking requirements is to prevent parking spillover and traffic congestion associated with cruising for on-street parking, our results suggest that MPRs are a blunt and inefficient form of parking management. Other forms of parking pricing that accounts for social externalities can be a superior parking management tool (Small (1992), Shoup (2004, 2005), Arnott et al. (2005)). For example, Arnott et al. (2005) show that an efficient on-street parking pricing scheme can produce travel time savings from reducing traffic congestion and wasteful cruising-for-parking activity and at the same time raise government revenues, which can be used to reduce distortionary taxation.

Minimum parking regulation is a pervasive feature of United States land-use practices. Davidson and Dolnick (2002) state that parking planning questions are among the top five queries for the American planning service each year. Authors such as Shoup (1999) and Davidson and Dolnick (2002) have suggested that parking regulation forces developers to place far more parking spots than necessary on their lot. Arnold and Gibbons (1996) detail the destructive environmental effects of excessive

impermeable surfaces. Shoup (1999) also suggest that parking regulations may have a dynamic effect where the design requirements of large parking areas render new development pedestrian unfriendly so that more individuals are forced to travel by car.

However, to our knowledge, the evidence that parking requirements increase the amount of parking spaces built is limited to a few case studies. This paper seeks to remedy that by examining whether there is evidence of a parking regulation effect for sold properties in Los Angeles. A simple theoretical model of optimal development of a parcel implies that the marginal value of parking should be less (equal) to the marginal value of land for a parcel plus the construction cost of parking in the presence (absence) of binding minimum parking regulations.

We test this proposition for a multi-year dataset of sales and for six different property types using a spatial error model. We find that for the majority of properties a null hypothesis of equality between marginal parking and marginal land plus construction costs is rejected at a 5% significance level. This supports the idea that minimum parking requirements significantly affect the amount of parking on a parcel. A direct comparison of required and actual parking spaces for a subset of office properties where we could obtain approximate parking requirements also indicates that parking requirements bind for a majority of properties. The magnitudes of the differences in the marginal quantities suggest that minimum requirements have large effects on the distribution of parcel space between various uses. Further research should examine the quantitative impact of parking minimums on the aggregate amount of parking and impervious space.

This research provides further evidence for the arguments of Shoup (1999) and Wilson (1995) that parking minimums significantly distort land-use decisions. In addition, the evidence that, in some cases, parking use value is a small fraction of parcel land value suggests that the efficiency losses from parking minimums may be quite large. However, a full consideration of the optimal level of off-street parking would have to consider the congestion externalities due to lower requirements as well as the environmental benefits of less parking.

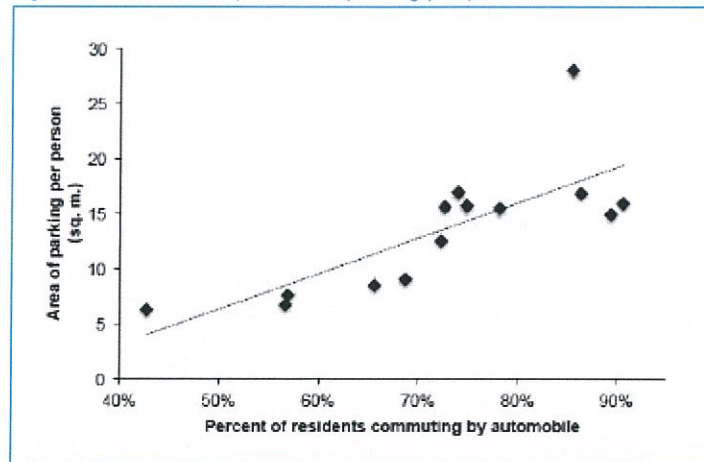
5.2.4 The influence of urban transportation and land use policies on the build environment and travel behaviour

In this dissertation McCahill (2012) considers two topics that are relevant to our discussion, namely:

- **Key policy decisions that influenced transport and land use outcomes.** In 1960 both Hartford (CT) and Cambridge (MA) had very similar transport and land use characteristics, but by the year 2000 vehicle mode share in Hartford had increased from 53% to 73%, whereas in Cambridge it declined from 42% to 38%. In Hartford the area of land per capita used for parking is more than three times that in Cambridge.
- **Relationships between automobile use and land consumption.** The author examines statistical relationships between vehicle mode share and the area of parking per capita in 14 cities in the U.S., and finds that increased vehicle mode share is positively correlated with increased area of parking per capita and negatively correlated with human density (residents plus employees), as one would expect. This suggests that increased use of vehicles leads to more parking (and vice versa), which in turn reduces the land available for development, notably dwellings and businesses.

McCahill's research strongly hints at (although does not prove) the fact that parking policy affects transport and land use outcomes. More specifically, it finds evidence of a relationship between the area of parking per person and the percentage of residents that commute by private vehicle. The author concludes the provision of parking leads to increased levels of driving and ultimately more parking area, which ultimately can be expected to cause congestion and lower land use density.

Figure 5.4: Relationship between parking per person and residents commuting by automobile



5.2.5 From Minimum to Maximum: Impact of the London Parking Reform on Residential Parking Supply from 2004 to 2010

The purpose of this study was to:

Examine residential parking supply in London before and after the minimum off-street parking standard was replaced by a maximum one in 2004. Based on 11,428 residential developments after and 216 developments before the reform, it is found that parking supply was reduced by approximately 40 per cent. Ninety-eight per cent was caused by the removal of the minimum standard, while only 2 per cent was due the imposition of the maximum standard. However, the parking supply is actually higher in areas with the highest density and the best transit service than in the areas immediately outside; the adopted maximum standard follows a similar pattern. The market-oriented approach to parking regulation can reduce excessive parking, but it depends on the particular sub-markets. Complementary policies such as strict parking maxima, on-street parking controls and parking taxes are often necessary to form an efficient parking market.

To paraphrase the most relevant findings from this study:

- Changes in London's parking policy, i.e. the removal of minimums and the imposition of maximums, were associated with a 40% reduction in the parking supplied with new developments;
- 98% of this reduction in parking is attributable to the removal of minimum parking requirements, with only 2% associated with the imposition of maximums; and
- The imposition of maximums has negligible impacts on the parking market unless they are set at a sufficiently low level that they "bind" for most developments.

The findings of this research from London are consistent with the Los Angeles results, i.e. that minimum parking requirements are a binding constraint on urban development.

6 Moving Forward

6.1 Proposed Parking Rates

There are two parking rates to consider:

- The target rate of supply for the city centre when fully completed and occupied; and
- The appropriate maximum parking rate to apply to developments in order to achieve the target rate of supply. This is the rate that will be stipulated in the respective precinct plans and enforced on new development in the city centre.

The target rate of supply represents desired parking rate within the city centre when considering all forms of parking, including private on-site car parks, consolidated parking areas, public car parks, and on-street parking.

In order to achieve this supply, statutory parking requirements must be appropriately set to ensure the desired balance between on-site and consolidated parking is achieved.

The proposed parking rates for the Maroochydore City Centre are as follows:

- Target rate of supply:
 - Residential: 1.1 spaces / dwelling;
 - Non-Residential: 1 space / 75m² GFA;
- Statutory Parking Requirements:
 - Residential: maximum 1 space / dwelling; and
 - Non-Residential: maximum 1 space / 200m² GFA.

Maximum and target parking rates have been based on review of parking rates from local government areas in Australia and overseas, MRCagney's broader traffic engineering experience, and review of suitable guides including Complete Streets and the Queensland TOD Guidelines.

In order to achieve the best result for the Maroochydore City Centre, it is crucial that these rates are adopted from the outset. Introductory or interim rates only serve to recreate the fragmented and private vehicle reliant urban form that the city centre is seeking to avoid. By enforcing these rates prior to the implementation of high quality public transit (in any form, whether it be light rail, heavy rail, BRT, etc), Council will ensure that early development actively builds an environment that support public and active transport. Anything short of this will actively do the opposite.

6.2 Appropriate Parking Supply

Based on the adopted parking rates outlined in the previous section, an appropriate parking supply has been determined for each stage of development. The process for determining appropriate on-site and consolidated parking supplies is as follows:

1. Determine the appropriate total parking supply based on the target rate of supply for residential and non-residential uses;
2. Determine the maximum on-site parking supply permitted for residential and non-residential uses; and
3. Calculate the required consolidated parking supply required to achieve the target parking supply, allowing for the provision of the maximum on-site parking provision (i.e. *consolidated parking supply = target parking supply – maximum on-site parking supply*).

Table 6.1 below outlines the required parking supply at each stage of development *in order to satisfy the target rate of provision*. Noting that parking provision is intended to be staged such that the rate of supply reduces over time as the City Centre is developed, this is not a proposed parking provision schedule.

Table 6.1: Required parking supply in order to achieve the target rate of supply for each stage

Stage	Dwellings	Non-Residential (GFA)	Occupied	Onsite Parking	Target Parking	Consolidated Parking
1a	441	58,752	2022	735	1,268	534
1b	159	25,248	2025	285	512	226
2	300	56,100	2030	581	1,078	498
3b	181	15,629	2032	259	407	148
3c	209	13,829	2034	278	414	136
4a	116	23,998	2036	236	448	212
4b	156	3,520	2037	174	219	45
5a	192	13,530	2039	260	392	132
5b	195	4,395	2041	217	273	56
Total	1,949	215,001		3,024	5,011	1,987

In order to achieve the desired steady reduction in the rate of parking supply as the City Centre develops, the provision of consolidated parking will be staged based on the following requirements:

- 1,500 spaces by the completion of Stage 1a; and
- 487 spaces by the completion of Stage 2.

This does not imply that either the 1,500 spaces or the 487 spaces need to be provided within one structure; in fact several smaller consolidated parking structures totalling 1,500 spaces for Stage 1a and 1,987 spaces upon completion may be more appropriate. Where decked parking is to be provided, footprints should not be excessive in order to minimise negative impacts at street level, however it may become uneconomical to construct decked facilities of greater than 6 storeys. Ultimately, 500 spaces per facility is considered an appropriate initial target, as discussed in Section 6.3.

Without more detailed development staging, it is somewhat difficult to advise upon suitable sub-staging of the 1,500 spaces within Stage 1a. Given the mixed-use nature of desired development within the PDA, it is expected that both residential and non-residential uses will be developed at a relatively consistent rate, however there is the possibility that one component will be significantly completed before the other. It is nonetheless recommended that staging of consolidated parking will be mostly driven by the development of non-residential uses, noting the much larger gap between targeted and maximum on-site parking rates for non-residential compared to residential uses (i.e. non-residential uses have a greater reliance on consolidated parking). An appropriate sub-staging of parking facilities would be to have a 500 space facility open at the outset, a second facility operational when ~20,000m² GFA of the non-residential component is constructed, and a third when ~40,000m² is constructed. This staging will be able to absorb faster than expected residential development to some degree, however if significant early residential development occurs, this approach may need to be revised. While this scenario may necessitate bringing construction of the second parking facility forward, it is also possible that the actual parking demand for consolidated spaces from the residential component will be less than expected in early stages of the PDA development. As such, some discretion will need to be exercised.

Table 6.2 below outlines the proposed staging of consolidated spaces and the associated reduction in the rate of parking supply over time. As shown in Table 6.2, the initial rate of supply is 1.94 spaces / dwelling for residential and 1 space / 43m² GFA for non-residential, which gradually reduces until the target rates of supply are achieved upon completion of Stage 5b.

It is noted that a parking rate of approximately 1 space / 40m² GFA for non-residential is generally consistent with the Development Scheme's specified 'interim' PDA car parking rates for uses such as retail, retail showroom, commercial, and services and community uses. It is expected that a steady parking supply rate reduction beginning from this origin will aid the development of the City Centre and best facilitate a transition from the current car dependent base to the dense active and public transport focussed urban form that the Maroochydore City Centre will create.

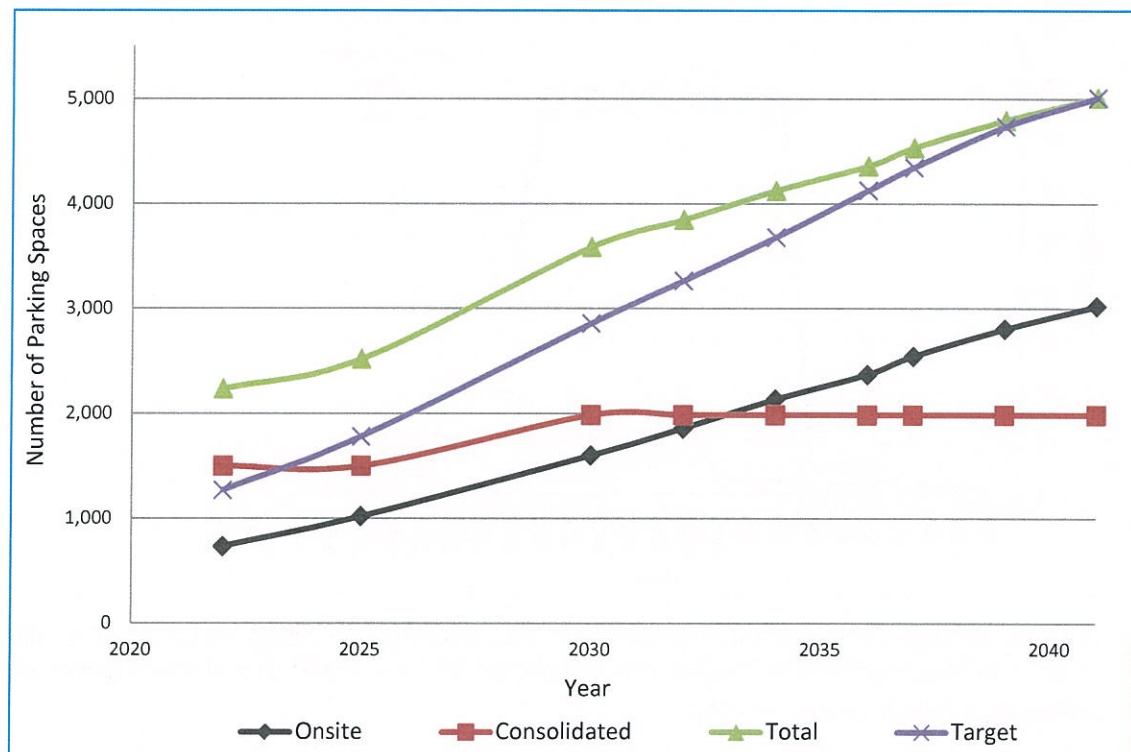
Figure 6.1 illustrates how on-site and consolidated parking provision will facilitate a gradually reducing rate of supply which ultimately converges with proposed target rates.

Table 6.2: Proposed Parking Provision – Staging of Consolidated Parking

Stage	Dwellings	Non-Residential (GFA)	Consolidated Parking Staging	Consolidated Parking Provision	On-site Parking Supply	Total Parking Supply	Effective Rate of Supply* - (Spaces per dwelling)	Effective Rate of Supply* - (1 space per XXm ² GFA)
1a	441	58,752	+ 1,500	1,500	735	2,235	1.94	43
1b	600	84,000		1,500	1,020	2,520	1.56	53
2	900	140,100	+ 487	1,987	1,601	3,587	1.38	60
3b	1,081	155,729		1,987	1,860	3,846	1.30	64
3c	1,290	169,558		1,987	2,138	4,124	1.23	67
4a	1,406	193,556		1,987	2,374	4,360	1.16	71
4b	1,562	197,076		1,987	2,547	4,534	1.15	72
5a	1,754	210,606		1,987	2,807	4,794	1.11	74
5b	1,949	215,001		1,987	3,024	5,011	1.10	75

*Note: Effective rate of supply calculations utilise the ratio of residential to non-residential spaces determined from calculated target provisions in order to assign 'excess' consolidated spaces to land use.

Figure 6.1: Maroochydore CBD – Appropriate Parking Supply

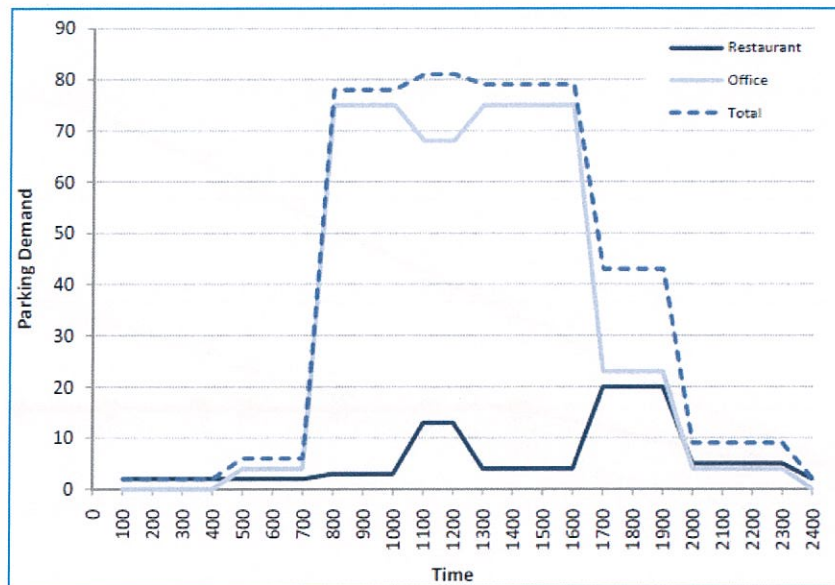


6.3 Mode of Parking Supply

6.3.1 Consolidated Off-Street Parking

Consolidating parking into single multi-use publicly accessible car parks within the Maroochydore PDA will support the full variety of expected activities, including commercial and retail uses. Each of these uses generate different travel patterns and parking demands, which in turn provide opportunities to share parking between uses with complementary peak hours, as previously discussed. The great advantage of shared consolidated parking facilities (which can be either publicly or privately owned) is that they are more efficient. Because each space is shared between multiple activities it ultimately ends up being used for more hours across the day, week, or month. Shared consolidated parking can also allow building owners and managers to generate more revenue from a site by leasing the parking spaces to different users. Figure 6.2 provides an example of how shared parking facilities can reduce the total number of parking spaces required. This example looks at a restaurant with 25 parking spaces and an office with 75 parking spaces as a result of minimum parking requirements. As Figure 2 shows, 81 car parks are required to meet total demand instead of the 100 that would be provided under minimum parking requirements (a saving of almost 20%). This shows how peak utilisation varies depending on the land use type, and how this can be used to reduce parking provision. This strengthens the case for consolidation where fewer car parks would be required to meet total demand as compared with the current situation on the Sunshine Coast where individual sites are required to provide off-street parking onsite without the opportunity for sharing consolidated parking resources.

Figure 6.2: Parking demand at a shared car park (restaurant and office uses)



There are no major operating and management constraints to preclude the development of a shared parking facility in the Maroochydore PDA. However, to ensure efficient operation consideration of several factors during detailed design will be required, including:

- Local peak times of demand;
- Availability of access to a number of different users;
- Clear information about appropriate use and availability; and
- Good pedestrian access between the facility and the destinations it serves.

As previously noted, the adoption of maximum parking rates will support the use of consolidated car parks in the Maroochydore City Centre.

Consolidated parking may be provided in multi-storey decked car parking structures, or basement car parks (see Section 6.4.1 for cost estimates for such facilities), however it is crucial that surface parking is not provided as a long term solution, and pursued with caution even as an interim measure. This recommendation is based on the large area that surface parking requires and the associated opportunity costs, land costs, and the negative effect that the resulting fragmented urban form will have on the vitality and prosperity of the city centre. Furthermore, once surface parking is provided, it may be difficult to remove and replace with denser, multi-storey facilities. It is recommended that Council consider collaboration with developers, if possible, in order to provide the recommended consolidated parking provision in the basement of suitable new developments.

6.3.1.1 Location of Consolidated Parking

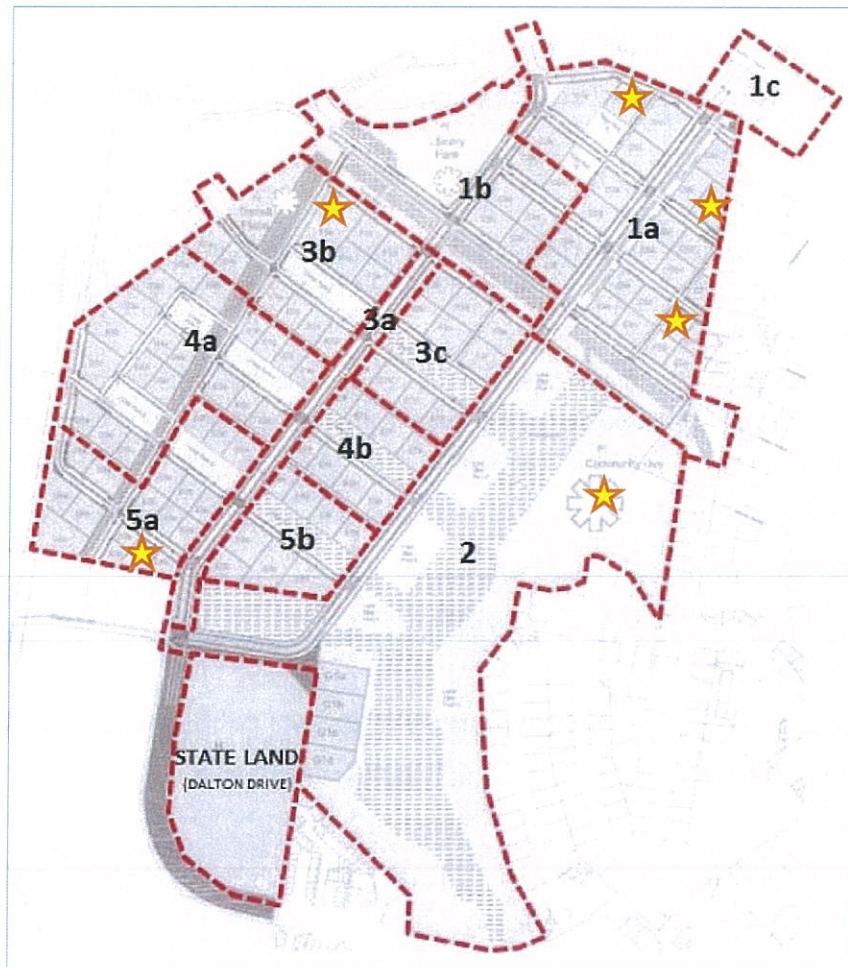
An appropriate consolidated parking provision of 1,987 spaces has been identified (as previously discussed), to be provided by the completion of Stage 2 in 2030. Car park staging has identified that 1,500 of the 1,987 consolidated car spaces will be provided by 2022. The provision of these 1,500 car parks should not necessarily be in one facility, but preferably in multiple facilities. The locations of these facilities should be determined based on the following criteria:

- Location is visible to motorists (without having an overbearing impact on the streetscape);
- Minimises traffic impacts within the PDA (preferably located at the edges of the PDA near higher order roads);
- Location provides suitable pedestrian access to key attractors;

- Pedestrian traffic between consolidated parking and key attractors encourages passing trade for retailers; and
- Site has the ability to provide initial surface parking that can be re-developed into structured parking as part of a larger development.

The following figure identifies six locations for consolidated parking structures. The locations of the parking facilities are flexible at this stage and may alter depending on certain constraints, intentions within precincts, main streets, and access. While it is recommended that four preferred locations be chosen to provide four ~500 space facilities, it may also be appropriate to construct smaller facilities at all 6 locations identified below.

Figure 6.3: Approximate consolidated car parking locations identified by stars



6.3.2 On-Street Parking

Within the Maroochydore PDA it is recommended a flexible 'demand based' approach to parking be adopted for on-street parking. This approach will manage parking demand by monitoring parking utilisation and making suitable adjustments to on-street parking prices when and where required as the city centre grows and user profiles evolve.

6.3.2.1 Area to be Covered

The entire PDA will be covered by the same on-street parking pricing regime. It is also considered critical that the on-street parking policies outside of the PDA be revised to reflect the same approach as within the PDA. This ensures adjacent areas are not unfairly benefitted or harmed by different approaches to parking policy, which would otherwise affect competitiveness.

6.3.2.2 Principles of Approach

Limitations of traditional on-street parking management practises are becoming more apparent throughout the world. Rigid approaches of setting time limits, or even prices, do not reflect dynamic urban environments and do not ensure that parking is available when and where it is needed.

Within the PDA the following principles for on-street parking are recommended:

- Prices should be set such that they enable people to be able to find a car park most of the time within a reasonable distance to their destination;
- In areas where demand is found to decrease, there should also be a decrease in parking charges and vice versa for high demand areas;
- On-street parking should be prioritised for short stay parking
- Prices should be transparent and based on empirical evidence of parking demand patterns, which are continually monitored.

6.3.2.3 Demand Responsive Parking

Time limits have traditionally been the preferred mechanism to encourage turnover, however they are inflexible and difficult to enforce. Time limits can also force people to cut their visit short or risk receiving a parking ticket, artificially reducing spending.

The intention for on-street pricing is that where on-street parking is priced, no time limits will be imposed; rather, demand responsive pricing will manage occupancy and turnover. This is simpler and more convenient for users and allows users to simply pay for the time they require, rather than be subject to arbitrary time limits.

The following is provided as a recommended starting point for on-street car parking management in the PDA:

- First 2 hours of on-street parking is free;
- Every subsequent hours will be at a cost of \$1 per hour; and
- Targeted occupancy of 90%.

Monitoring will be required from the outset in order to calibrate pricing such that the target occupancy of on-street spaces is achieved and maintained.

6.3.2.4 Price Adjustment

Parking demand will be adjusted by demand. The site will need to be divided into areas with similar demand profiles with price areas that may change over time. Pricing will be uniform across each price area.

The following recommendations are provided in relation to price areas:

- Initially the entire PDA should be managed as one single price area;
- Every 6 months, Council must review demand and identify areas with similar demand profiles and establish separate price areas (this should be both within and outside the site);
- Council should continue to monitor demand within each price area and adjust price according to the following formula:
 - Where average occupancy is below 50%, lower price by up to \$1 per hour, with no minimum price (free is necessary);
 - Where average occupancy is between 50% and 70%, lower price by \$0.50 per hour;
 - Where average occupancy is 70%-90%, do not alter price; and

- Where average occupancy exceeds 90%, raise the price by up to \$1 per hour.

6.3.2.5 Time of Operation

The above mentioned pricing regime should be implemented between 8AM and 6PM 7 days per week. However, demand should be monitored outside these periods. Should demand approach 90%, the hours of operation should be expanded.

6.4 Costing and Funding

6.4.1 Cost of Consolidated Off-Street Parking

Previous project experience in South East Queensland by MRCagney has been reviewed in order provide cost estimates for the construction of off-street parking facilities, excluding the cost of land.

The following construction cost estimates are provided for three distinct types of off-street parking:

➤ Surface car parking: \$15,000 / space

Surface parking refers to any at grade parking area, however if significant ground works (cut and/or fill, large retaining walls, etc) are required, this will affect costs. Given that the estimated cost of provision does not include land costs, this price does not distinguish between true surface parking and 'tuck under' parking, where at grade parking is provided underneath the first level of a building, which typically reduces the area of land required to support a given development.

➤ Decked car parking: \$35,000 / space

Decked parking refers to podium or multi-storey above grade parking facilities. Decked car parking can be provided in a standalone parking structure or within a building that includes other uses (residential/non-residential/mixed-use, etc). It is recommended that, based on relevant experience, the cost of decked parking tends to climb significantly once the parking structure exceeds 6 storeys. Given that decked parking is provided within a building footprint that can include additional uses, decked parking is an space efficient means to provide parking when required, and construction costs can be more than offset by savings in land costs.

➤ Basement car parking: \$50,000 / space

Similar to decked parking (except provided below grade rather than above), basement parking is an efficient means to provide parking, and the increased costs involved are offset, in part or fully, by reduced land costs and improvements to streetscapes and the urban form.

6.4.2 Delivering Consolidated Parking

Consolidated parking can be provided either by the Sunshine Coast Regional Council or the private sector.

6.4.2.1 Public Sector Delivery Options

Funding the delivery of consolidated car parking by Council could be achieved using a targeted rate at commercial and retail development within the Maroochydore PDA. The revenue collected based on this targeted rate could contribute to the financing of public consolidated parking facilities. Without minimum parking requirements, development costs will be significantly reduced which in turn will offset the impact of targeted rates. It is possible that there may be opposition to the targeted rates from businesses directly affected, however the provision of shared consolidated parking facilities is expected to benefit all businesses by ensuring increased access by all customers and visitors.

Calculation of the required funding level will require further investigation. Based on approximately 215,000m² of GFA (retail and commercial combined) and 1,987 consolidated car spaces at an approximate cost of \$35,000 per space (\$70 million in total) with payments amortised over 25 years with 5% interest, the annual targeted rate would be approximately \$20-25 per annum per square metre of GFA. If the number of properties which are charged the targeted rate is increased (for example areas surrounding the PDA, which would also be expected to benefit from the facilities) then this would reduce the cost burden being placed on businesses within the PDA. A small supermarket (400m² GFA), for example, would require 20 spaces based on the existing minimum parking rate of 1 space / 20m² GFA within the Sunshine Coast Planning Scheme 2014. At a cost of \$35,000 per space, this would cost the developer \$700,000. Under the proposed conditions, the same supermarket would be able to provide up to 2 spaces based on a maximum rate of 1 space / 200m² GFA, and would be charged \$8,000 - \$10,000 p.a. (depending on the adopted rate) for 25 years to fund consolidated parking facilities (a total of \$200,000 – \$250,000). This represents good value and incentivises development within the PDA.

Alternatively a development contribution may be imposed on developments within the PDA that contribute towards the construction of the public off-street car parks. The downside is that the addition of a parking component in development contribution charges will increase the cost of development within the PDA, however developments would already benefit from not having minimum parking requirements in place.

It is assumed that the development contributions would be charged per square metre of new development. The Maroochydore parking targeted rates were used to determine the development contribution rate. Based on 1,987 consolidated car parks at an approximate cost of \$70 million shared between 215,000m² of GFA, the resulting contribution required would be approximately \$325 per square meter of GFA.

Under both scenarios the parking facility would then be coupled with a user charge so that those using the facility pay a greater percentage of the cost of the facility than those businesses whose customers and employers may use alternative forms of transport. This will ensure fairness and economic efficiency.

Outside of the PDA such an arrangement is not appropriate given that there is already an over-supply in parking. Instead, the approach should focus on encouraging infill by removing impediments to quality development such as minimum parking requirements, setback requirements, and height limits. Over time, this will result in the development of much higher quality urban environment. Once again, it is stressed that the maximum parking requirements and other demand management strategies espoused in this report should be applied outside the PDA to the Sunshine Coast metropolitan area more generally.

6.4.2.2 Private Sector Delivery Options

A privatisation model may be preferable for parking in the Maroochydore PDA where a development site has entitlement to build, operate and maintain a publicly accessible off-street parking facility. The attraction to developers will be that there is a maximum parking cap within the PDA limiting parking supply and they will have the ability to levy charges. The early development of a consolidated publicly accessible parking facility is likely to be unattractive to developers initially due to the high provision of parking both within and around the Maroochydore PDA which reduces the financial viability of developing a car park as the value placed on a single car park will be limited. To make the proposition more attractive at early stages of development, alteration to the PDA should be considered so that a 'density bonus' is provided to the sites that carry the entitlement for a consolidated parking facility. This will enable the site to be attractive in both the short and long term.

Alternatively, Council could develop the facility initially and once a viable parking market is established within the PDA look to lease or sell the public parking facility and management rights. Another option is that initially surface parking is provided on the sites earmarked for a consolidated parking facility by Council. Once there is sufficient demand, Council would look to release the site to the open market. This would enable consolidated off-street parking to be provided initially at a low cost. Parking charges would need to be levied on the initial surface lot to

ensure a value is placed on the off-street parking. Considerations should also be given to how the surface parking is configured that would allow its continued operation until the consolidated parking structure is established (for example, surface parking could be restricted to only 50% of the developable land).

6.5 Design Considerations

6.5.1.1 Smart Parking

Smart parking refers to different applications that collect and disseminate key parking information to motorists. Through the introduction of smart parking applications key information relating to parking facilities could be collected in real-time such as the utilisation. To realise full benefits of the introduction of smart parking, smart technologies need to be integrated into a common base architecture that ensures interoperability between different applications and transport technologies. This would allow the dissemination of information to motorists, such as:

- Availability of parking spaces;
- Directions to the location of available parking spaces;
- Cost of parking; and
- Other parking restrictions.

Dissemination of information could via the following means:

- On road Variable Message Signs (VMS);
- Dynamic directional signage within parking facilities;
- Internet website; and
- Smartphone applications.

7 Summary and Recommendations

In order to create a vibrant and prosperous city centre, the following recommendations are provided in relation to parking policy:

1. Parking policy must not be predicated on a predict and supply mentality.
2. Public and active transport modes must be prioritised when considering access to and movement within the city centre.
3. Parking policy must contribute to high-quality urban outcomes, with a particular focus on the amenity of the pedestrian environment.
4. Ensure the price of parking maintains demand and turnover at appropriate levels and is sufficient to cover the long-run cost of providing parking.
5. The cost of parking provision must be borne by users.
6. Maximum parking rates should apply within the city centre from the outset, as follows:
 - a. Residential: maximum of 1 space / dwelling; and
 - b. Non-residential: maximum of 1 space / 200m² GFA.
7. Parking should be located primarily in consolidated parking facilities in order to:
 - a. Promote multi-purpose trips;
 - b. Encourage pedestrian traffic through the city centre; and
 - c. Reduce fragmentation of the urban form associated with on-site surface car parking.
8. Parking supply rates should steadily reduce as the city develops, recognising that early developments will initially be more car dependent in the absence of the benefits of density, which will be realised as additional developments begin to operate. This will be achieved by providing consolidated car parks immediately. As further development occurs will little increase to the parking supply, the parking supply rate will reduce.
9. Approximately 2,000 consolidated parking spaces are required, with 1,500 to be provided by 2022 (i.e. for stage 1a), and an additional 500 to be provided by 2030 (Stage 2). It is recommended that consolidated parking be provided in multiple facilities of approximately 500 spaces each.
10. Consolidated parking may be provided by the public or private sector. To fund public sector provision, a yearly levy of \$20-25 / m² of GFA, or a development contribution of \$325 / m² of GFA may be suitable.
11. On-street parking should be priced, rather than time limited, with an initial starting point of:
 - a. Free parking for first 2 hours; and
 - b. Subsequent hours charged at a cost of \$1 per hour.
12. The target rate of occupancy for on-street parking should be 90%. Council should continue to monitor demand and adjust price according to the following formula:
 - a. Where average occupancy is below 50%, lower price by up to \$1 per hour, with no minimum price (free is necessary);
 - b. Where average occupancy is between 50% and 70%, lower price by \$0.50 per hour;
 - c. Where average occupancy is 70%-90%, do not alter price; and
 - d. Where average occupancy exceeds 90%, raise the price by up to \$1 per hour.

13. It is critically important that the recommended parking policies are applied beyond the PDA to the entire Sunshine Coast metropolitan area (most importantly Maroochydore and Mooloolaba) to avoid market distortions arising from divergent approaches to parking in adjoining areas.

