DISCUSSION TOPIC SUMMARY

Topic: Access Hamilton Strategy - Parking

Related Committee: Infrastructure Operations and/or Strategic Growth

Business Unit/Group: Transportation (Infrastructure Operations) and Strategic Development (Development)

Key Staff Contact/s: Jason Harrison & John Purcell (Transportation) and Melissa Clark (Strategic Development)

Direction Discussion/Drop in Session recommended? Direction

Information Status: Open

PURPOSE OF TOPIC/INFORMATION

Staff require direction/feedback from Members on the following parking topics to put together options for an upcoming report(s) to

1) the CBD and River Plan Advisory Group; and
2) the Infrastructure Operations Committee:

- proposed parking infringement innovation
- meter technology
- areas that staff have identified as possible on-street commuter parking opportunities in the CBD – implementation of the Annual Plan resolution
- guidance on the development of Parking Principles

WHAT KEY THINGS SHOULD MEMBERS THINK ABOUT/ CONSIDER IN UNDERSTANDING THIS INFORMATION?

- the use of parking technology and what is the right level of technology to implement so it is as inclusive as possible.
- whether the proposed on-street commuter parking areas are located in the right areas (i.e. areas already used by commuters or under-utilised under the current 2-hour free on-street parking offering).
- Parking is a sensitive topic and will require Member's visibility and input that will be used to help set / inform the Parking Principles, which are required to give effect to the National Policy Statement on Urban Development.
- Members should think about how to align the development of Parking Principles with other strategic documents (e.g. Modal Shift Plan; Metro-Spatial Plan; National Policy Statement on Urban Development).
- With the previous Council, through the Access Hamilton Taskforce, staff commenced the development of parking objectives and principles. The status of this work is DRAFT (May 2019).

KEY SUMMARY POINTS

- Parking is a key lever in realising the current Access Hamilton vision:

'Hamilton's transport network enables everyone to connect to people and places in safe, accessible and smart ways'.

We are giving effect to this vision by focusing on improving the health and wellbeing of Hamiltonians by ensuring the transport network supports good travel choices that are safe, easy and connected.

Guidance with the parking matters raised in this briefing will assist staff in focusing on the right options and priorities:

Proposed parking infringement innovation & meter technology

- Guidance on the appropriate innovation and technology will allow staff to review and prioritise budget expenditure – examples will be provided at the briefing.
- Guidance at this briefing will enable staff to focus on the right technology options for managing parking across the city.

Areas that staff have identified as possible on-street commuter parking opportunities in the CBD

- Guidance on the proposed commuter parking opportunities is time critical (as this needs to be consulted on) – FYI, additional parking revenue ($400,000) is expected through the AP 20/21 and this initiative is what will give effect to this.
- Are there any other options?

The development of Parking Principles

- The development of Parking Principles are required to allow specific Parking Plans to be developed. Precincts and Areas identified as requiring a Parking Plan are listed below.

Table 1: Current list of precincts and areas of interest:

Precincts	Central City; CBD Fringe; Frankton; Hospital; Hamilton East; University; Chartwell; Te Rapa;
Areas	Sportsfield – Citywide; School Zones – Citywide; After hour Callouts – Citywide; Bus Lanes; Events; Rototuna Village

NB1: It is proposed that the Central City will be the first Parking Plan developed
NB2: Other precincts and/or areas may be added, as required by Elected Members.

WHERE CAN MEMBERS FIND MORE INFORMATION?

- Draft version of Hamilton Parking Management Plan (May 2019) is attached
- Summary of Technical Evidence – Hamilton Parking Management Plan (May 2019) is attached

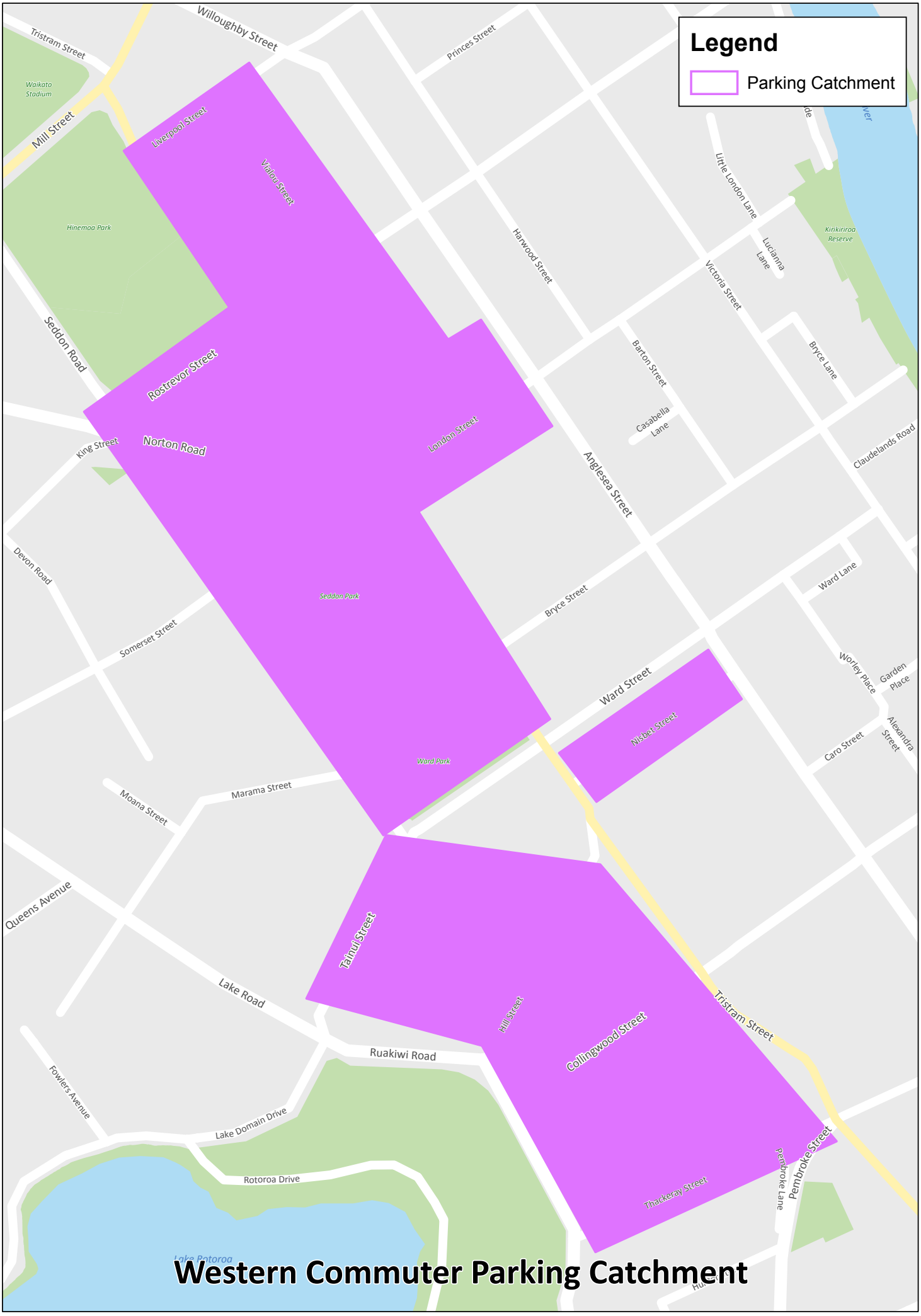
WHAT DIRECTION/FEEDBACK/INPUT IS NEEDED FROM MEMBERS

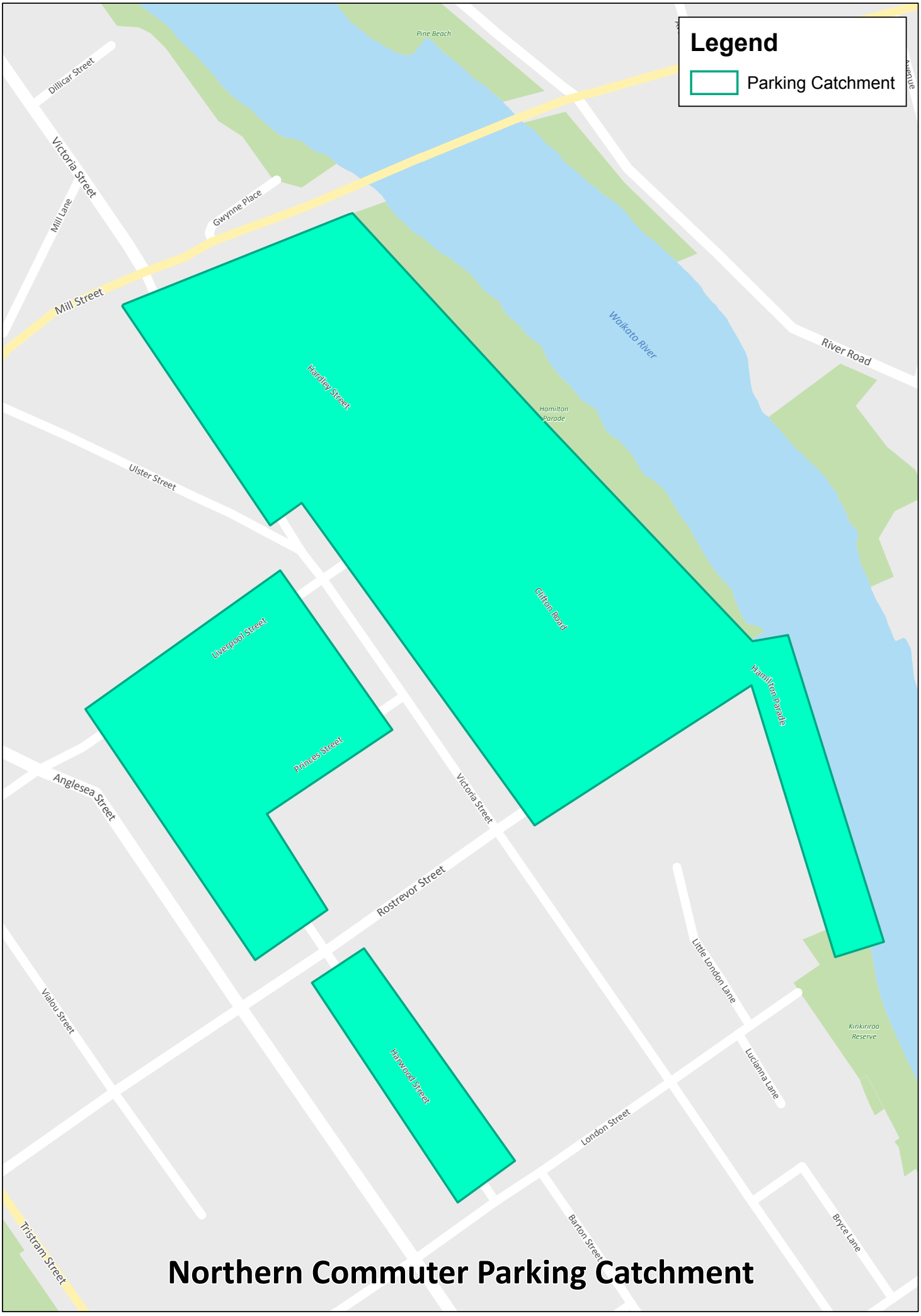
- Staff need feedback on preferred parking infringement innovation option/s
- Staff need feedback on the preferred parking meter technology
- Staff need feedback on the general areas for introducing on-street commuter parking

opportunities in the CBD and meter technology and innovation that will be used to manage this activity

- Staff would like guidance on how the Parking Principles should be progressed.


Legend
Parking Catchment
Parana Park
Memorial Park
Memorial Drive
Waikato River
Collingwood Street
Sapper Moore-Jones Place
Alexandra Street
Grantham Street
Victoria Street
Hood Street
Knox Street
Ferrybank
Thackeray Street
Anglesea Street
Tisdall Terrace
Tisdall Street
Anzac Parade
Clarence Street
Cobham Drive
Dunsford Mews
Tristram Street
Radnor Street
Anglesea Street
Palmerston Street
Palmerston Street Reserve
Southern Commuter Parking Catchment


Legend
Parking Catchment
Willoughby Street
Tristram Street
Princes Street
Waikato Stadium
Mill Street
Liverpool Street
Vialou Street
Hinemoa Park
Harwood Street
Little London Lane
Lucianna Lane
Kirikiriroa Reserve
Victoria Street
Seddon Road
Rostrevor Street
Barton Street
Bryce Lane
Casabella Lane
Norton Road
King Street
London Street
Anglesea Street
Claudelands Road
Devon Road
Seddon Park
Bryce Street
Ward Lane
Somerset Street
Worley Place
Garden Place
Ward Street
Nisbet Street
Caro Street
Alexandra Street
Ward Park
Marama Street
Moana Street
Queens Avenue
Tainui Street
Hill Street
Collingwood Street
Tristram Street
Lake Road
Ruakiwi Road
Fowlers Avenue
Lake Domain Drive
Rotoroa Drive
Thackeray Street
Pembroke Lane
Pembroke Street
Lake Rotoroa
Western Commuter Parking Catchment


Legend
Parking Catchment
Pine Beach
Dillicar Street
Victoria Street
Mill Lane
Gwynne Place
Mill Street
Waikato River
River Road
Hardley Street
Hamilton Parade
Ulster Street
Clifton Road
Liverpool Street
Princes Street
Anglesea Street
Victoria Street
Rostrevor Street
Little London Lane
Vialou Street
Harrwood Street
Lucianna Lane
Kirikiriroa Reserve
London Street
Barton Street
Bryce Lane
Tristram Street
Northern Commuter Parking Catchment

Road Section	Spaces	Catchment	Loc desc	Space notes	1st cut
Hamilton Parade East unmarked unsensored	27	Northern	River Side	unmarked/unsensored	
Harwood Street West Rostrevor to Liverpool St	16	Northern			16
Liverpool Street North Anglesea to Victoria St	14	Northern			14
Harwood Street East London to Rostrevor St	25	Northern			25
		82			
Grantham Street East	9	Southern	angled parks os Rowing Club	unmarked/unsensored	
Grantham Street West	28	Southern			28
Clarence Street South	16	Southern			16
Knox Street South 2018	43	Southern			43
		96			
Hill Street North unmarked/unsensored	27	Western	Outside HGHS	unmarked/unsensored	
Nisbet Street North unmarked/unsensored	11	Western	CBD	unmarked/unsensored	11
Nisbet Street South unmarked/unsensored	20	Western	CBD	unmarked/unsensored	20
Collingwood Street North unmarked/unsensored	21	Western	Lake Road end	unmarked/unsensored	
Tristram Street West unmarked/unsensored	29	Western	Outside Hinemoa Prk and Tennis Club	unmarked/unsensored	
Vialou Street East unmarked/unsensored	22	Western	Outside Countdown	unmarked/unsensored	
Rostrevor Street North umarked/unsensored	15	Western	Outside Hinemoa Park	unmarked/unsensored	
Rostrevor Street South umarked/unsensored	14	Western	Outside Founders Theatre	unmarked/unsensored	
London North unmarked/unsensored	15	Western	Outside Founders Theatre	unmarked/unsensored	
Tristram Street West London St to Rostrevor St	24	Western			24
London Street North Norton Rd to Anglesea St	14	Western			14
Tristram St East Bryce St to London St	16	Western			16
		228			227
Total Spaces - Initial pass	406				

MRCagney

BETTER TRANSPORT • BETTER PLACES • BETTER CHOICES

Hamilton Parking Management Plan

Draft

Prepared for: Hamilton City Council

Prepared by: MRCagney Pty Ltd, Auckland, New Zealand

Document Information

Project Name	Hamilton Parking Management Plan
Status	Draft
Client	Hamilton City Council
Client Reference	PSP 18245
MRC Reference	NZ 2420
File Name	https://mrcagneypl.sharepoint.com/sites/HamiltonParkingStrategy/Shared Documents/General/Hamilton Parking Management Plan - DRAFT.docx

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Quality Assurance Register

Issue	Description	Prepared by	Reviewed by	Authorised by	Date
1	Draft Storyboard	FT/AL	AL	AL	18/03/2019
2	Draft Management Plan v1	FT	AL	AL	10/04/2019
3	Draft Management Plan v2	AL	SC	SC	29/04/2019
4	Draft Management Plan v3	AL	BB	BB	15/05/2019
5	Draft Management Plan v4	BB	SC	SC	29/05/2019

Contents

Figures

Tables

1 Introduction/Background

Parking is an essential component of any city transport network. Managing car parking effectively is crucial to achieving our Community outcomes (A city that embraces growth; A great river city; A Council that is best in business) for Hamilton, especially to realise the full economic potential of the city centre and suburban centres and to support Hamilton's transport modal shift objectives (i.e. Transport Choice) as adopted in *Access Hamilton*.

The overarching goals of parking management in the city are to prioritise a safe transport network, achieve a more efficient use of existing parking resources, support economic development and balance accessibility needs without leading to an overdependency on the use of private motor vehicles.

This *Hamilton Parking Management Plan* contains parking management objectives and policies that, firstly, encourage more efficient utilisation of parking resources and, secondly, manage demand, which is more cost effective than increasing supply.

This management plan seeks to integrate the policy direction laid out in key strategies such as *Access Hamilton* (i.e. Safety, Transport Choice, Supporting Economic growth and development) and enable our Community outcomes (A city that embraces growth; A great river city; A Council that is best in business). This involves a parking management approach that results in:

- reduced development costs;
- more compact, multi-modal city centre and suburban centre planning (more accessible and more efficient land use development);
- mobility management - proactive encouragement of public transport and active transport modes and reduced reliance on private vehicle use (thus reducing traffic congestion, pollution, accidents, and other externalities); and
- more amenable and attractive city centres, suburban centres and streets and more walkable communities; and
- No-one to be killed or seriously injured on Hamilton's transport network.

Additionally the plan aligns with the direction laid out in the Government's 2018 Policy Statement on Land Transport (GPS), which has a significant focus on mode neutrality in transport planning. Mode neutrality is defined as *'… considering all transport options for moving people and freight, including multi-modal options, when identifying the best, value-for-money transport solutions to deliver transport outcomes'*. In relation to parking, this also means "*better management of parking to reduce subsidies for private vehicle trips."* The plan also comprises policies that deliver on the GPS' safety objective of a *"land transport system that is a safe system, free of death and serious injury"*.

To this end, this plan addresses parking management throughout Hamilton by; outlining the approach to managing public parking in both city centres and town centres, outlining the approach to managing public parking in residential streets near busy land uses, stating the priority of different uses of kerbside space within the City, providing guidance on how parking management influences the use of public transport and active modes, addressing the emergence of new transport technologies, outlining Park and Ride principles and use, and considers the benefits of emerging parking technology. Through this plan, Hamilton City Council will therefore take a holistic citywide management approach to parking, where issues related to parking are managed according to this plan's policies and objectives in a transparent and consistent manner.

2 Strategic Alignment/Direction

The plan is informed by strategic objectives as outlined in the Access Hamilton Strategy, alongside other strategy and policy documents. Local strategic documents are themselves informed by regional and national strategies and policies, including the Government Policy Statement on Land Transport.

It is recommended that the decision-making hierarchies set out in this plan are used to inform the area/precinct specific parking action management plans, which will be used to inform changes to parking and other public amenities in Hamilton streets. Ultimately, using this plan to inform on-street changes will deliver outcomes that achieve Hamilton's transport priorities and Community outcomes.

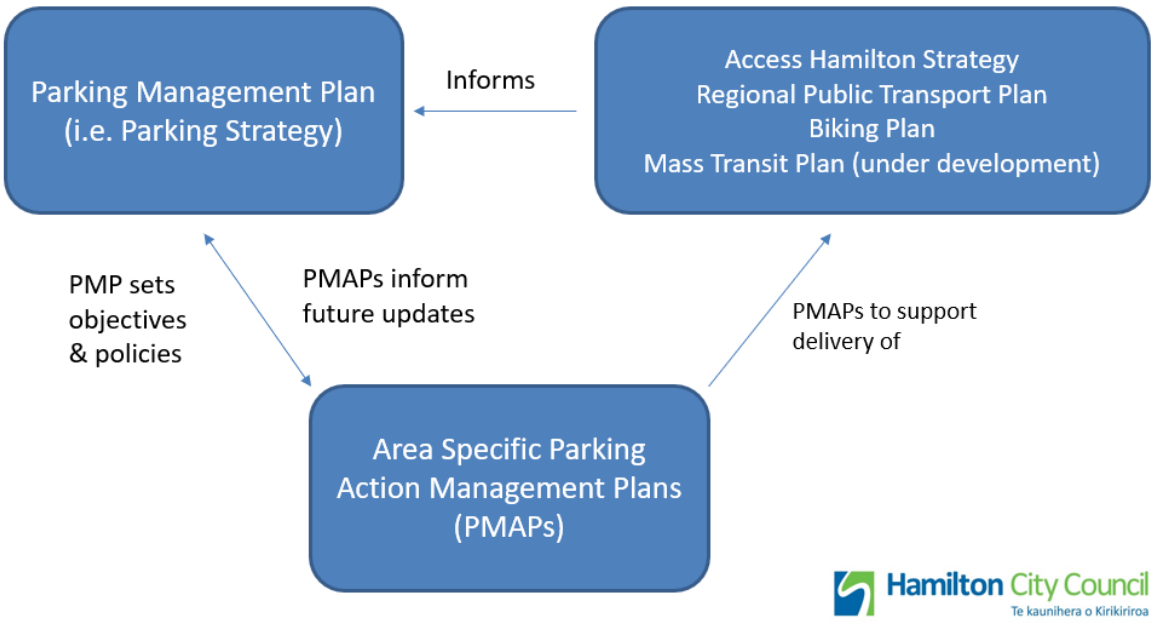

Figure 1: Relationship between different strategic documents

The 'Kerb Space Hierarchy' (Table 1) and 'Parking Hierarchy' (Table 2) presented in this plan identify the ideal order in which to consider the different ways kerb space could be utilise but are neither retroactive nor dictatorial. The plan is a way to establish a framework to respond to emerging issues, to guide decision-making about Hamilton streets and public places. Decisions about those streets and places will be informed by both the principles within this plan, and community voice.

3 Citywide – Kerbside and Parking Hierarchies

3.1 Issues Addressed

1. Competing demands for kerbside space means the need for kerbside parking must be weighed up against other uses of kerbside space, such as traffic lanes or public transport lanes.
2. There are varying benefits for the different uses of kerbside space, but these benefits are not equal in all locations and vary in magnitude and in relative terms to each other throughout the different environments in the City.
3. The challenge is therefore to appropriately prioritise the differing uses of kerbside space in the right location that balances the need to move people and vehicles and the need to support local places through providing parking.
4. The competing demands for different types of parking must also be weighed up against the place functions (land use, including the use of public places) the parking is intended to support.

3.2 Outcomes/Objectives

1. In all locations, safety and maintaining legal access to properties are the foremost priorities when allocating kerbside space.
2. Prioritise using kerbside space to support local place functions such as retail, hospitality, parks, education, healthcare and public services in city centre, town centre and suburban centre environments.
3. Prioritise kerbside space for movement functions in arterial environments outside of city centre and suburban centre environments, in line with the goals of *Access Hamilton*.
4. Kerbside management in city centres and suburban centres should prioritise access by public transport, active modes, loading, pick-ups and drop-offs, and short-stay car parking.
5. Parking in residential areas should prioritise access by public transport, active modes and short-stay general parking ahead of parking for any specific group of users.

3.3 Policy 1

Kerbside space should be allocated in accordance with the following kerbside management framework. The framework identifies locations where the different uses for kerbside space would be most appropriate. In addition to identifying locations where kerbside uses for the movement of people and goods should be a higher priority, it identifies locations where expanded public realm and amenity improvements (for example, extending the footpath to include seating or dwelling areas) would be beneficial.

Please note:

- The framework identifies priorities for kerbside space in different land use contexts and street categories. Once the first priority is met (e.g. safety), the next priority can be considered (e.g. amenity or movement).
- The provision of various kerbside uses still need to be provided in accordance with anticipated demand. For example, even though in non-arterial streets in activity centres amenity and pedestrian features are higher priorities than car parking, in most instances there is likely to be at least some demand for short-stay general parking. Therefore, an incremental approach to

reallocation of short-stay parking is recommended, where a greater emphasis may need to be placed on amenity, public realm and the role of on-street car parking.

- Furthermore, interventions to mitigate parking removal on roads need to be developed (as part of an area-specific Parking Management Action Plan) to address the concern of lost car parking in some locations. These could include:
  - Better utilisation of parking on side streets by implementing additional time restrictions.
  - Better utilisation of off-street car parks.
  - Improving directional and information signage.
  - Investigate additional parking opportunities in the road reserve, e.g. converting parallel parking to angle parking where there is enough width within the road reserve.
  - Decisions on whether additional investment in off-street parking is warranted (subject to further assessment).

Table 1: Kerbside Space Hierarchy

	Residential		City/Suburban Centre		Industrial	
Priority	Arterial	Non-arterial	Arterial	Non-arterial	Arterial	Non-arterial
1 (Highest)	Safety: Reduced crash risk	Safety Reduced crash risk	Safety: Reduced crash risk	Safety Reduced crash risk	Safety Reduced crash risk	Safety Reduced crash risk
2	Existing Property access (access to driveways)	Existing Property access (access to driveways)	Existing Property access (access to driveways)	Existing Property access (access to driveways)	Existing Property access (access to driveways)	Existing Property access (access to driveways)
3	Footpaths	Footpaths	Footpaths	Footpaths	Footpaths	Footpaths
4	Vehicle Movement Movement of people and goods as determined by higher order transport policy and demand (e.g. general lanes, bus lanes, clearway, cycle lanes, etc.)	Vehicle Movement: Sufficient passing opportunities to enable access to emergency vehicles and passage of vehicles	Vehicle Movement Movement of people and goods as determined by higher order transport policy. (e.g. general lanes, bus lanes, clearway, cycle lanes, etc.)	Amenity and Pedestrian Realm: Street trees Landscaping Public realm	Vehicle Movement: Movement of people and goods as determined by higher order transport policy and demand. (e.g. general lanes, bus lanes, clearway, cycle lanes, etc.)	Amenity and Pedestrian Realm: Street trees Landscaping Public realm
5	Car Parking	Amenity and Pedestrian Realm: Street Trees and Nature Strips	Mobility parking	Mobility parking	Car Parking	Vehicle Movement
6	Amenity and Pedestrian Realm: Street Trees and Nature Strips	Car Parking	Cycle parking	Cycle parking	Amenity and Pedestrian Realm: Street Trees and Nature Strips	Car parking
7			Amenity and Pedestrian Realm: Street trees Landscaping Public realm	Car Parking		
8			Car parking	Vehicle Movement Movement of people and goods as determined by higher order transport policy. (e.g. general lanes, bus lanes, clearway, cycle lanes, etc.)		

3.4 Policy 2

Parking should be allocated in accordance with the following parking hierarchies. The parking hierarchies below only apply when a decision to allocate kerbside space for parking has been made.

Table 2: Parking Hierarchy

Priority	Residential	City/Suburban Centres	Industrial
1 (Highest)	Public transport stops	Public transport stops	Public transport stops
2	Car share parking	Car Share Parking	Goods Vehicle Only Loading zones
3	Short-stay parking	Small PSV pickup/drop of spaces	Car Share Parking
4	Long-stay parking	Goods Vehicle Only Loading zones	Small PSV pickup/drop of spaces
5	Residential permit parking	Short-stay motorcycle parking	Short-stay motorcycle parking
6		Short-stay electric vehicle parking	Short-stay electric vehicle parking
7		Short-stay general parking	Short-stay general parking
8		Long-stay parking	Long-stay parking
9 (Lowest)		Residential permit parking	

Please note:

- This hierarchy does not necessarily mean that most parking space is provided to users at the top, but rather consideration to accommodating those users' needs should be given first before considering the next group of users in the hierarchy. For example, if public transport stops are already accommodated well through sufficient on-street bays, there would be little need for any further interventions to prioritise public transport. Decision-makers could then move on down the hierarchy to consider whether special management tools are needed to cater to other users' needs.
- Whether or not parking spaces are provided in the formats indicated in the hierarchy is a decision that must incorporate understanding of anticipated parking demand. For example, even though in centres mobility parking and cycle parking are higher priorities than short-stay general parking, in most instances there is likely to be significantly more short-stay general parking provided due to the large demand for this parking. However, if there is sufficient existing or anticipated demand for cycle parking then cycle parking spaces would replace some existing short-stay general parking spaces.
- Where general parking spaces have been reallocated to other types of parking, interventions to mitigate parking removal on roads need to be developed (as part of an area-specific Parking Management Action Plan) to address any concern related to lost car parking in some locations. Mitigation of concerns may involve recommendations for:
    - Better utilisation of parking on side streets by implementing additional time restrictions;
    - Better utilisation of off-street car parks;
    - Improving directional and information signage so that people can find parking spaces;
    - Demand management through time restrictions or pricing;
    - Investigate additional parking opportunities in the road reserve;
    - Decisions on whether additional investment in off-street parking is warranted (subject to further assessment).

4 City Centre and Suburban Centres – Demand Management

4.1 Issues Addressed

1. There has been an inconsistent and variable response to managing parking pressures in the city centre over the last ten years.
2. 'Free parking' has been arrived at as a solution to attract visitors to the city centre and has been implemented within the last ten years, but this intervention does not take advantage of a whole suite of demand management tools available to maximise parking utilisation and turnover to support economic activity in the city centre and suburban centres, which includes unpriced parking.
3. There are competing demands for parking in the city centre and suburban centre between customers, visitors and local workers.
4. Reduction in private off-street parking supply in the city centre as a result of recent regulatory reform, especially for city centre residential developments, require Council to address the use of its public parking resources in the city centre.
5. Potential proliferation of off-street car parks, especially transitory (short-term, privately operated) car parks, potentially detract from the amenity of centres, affect economic vitality and undermine mode shift objectives.

4.2 Outcomes/Objectives

1. Adopt a flexible parking demand management response that adapts interventions to varying levels of parking demand.
2. Ensure public on and off-street parking in city centres and suburban centres is prioritised for visitors and customers, in line with strategies such as the *Central City Transformation Plan*.
3. The demand management response must ensure that the increase of parking supply in centres is only considered once all other management responses have been exhausted.
4. Control the proliferation of transitory off-street car parks where amenity, centre vitality and travel mode shift goals are negatively affected.

4.3 Policy 1

For council-operated public parking within the city's main centre, an optimal average peak parking occupancy rate of 85% is recommended. A parking occupancy rate of 85% is widely accepted and implemented as the optimal rate as it ensures parking resources are well-used but also allows people to find a parking space relatively quickly.

When measuring average peak occupancy, it is recommended that the four busiest hours are averaged. This avoids a skewing of results downward, which is more likely to occur if occupancy over the whole day is averaged.

Parking surveys or parking technology, such as sensors, should be used to analyse parking demand and determine suitable adjustments of time or price restrictions.

Analysis of parking demand may determine that free parking is not suitable in some central-city locations, in accordance with Policy 2 below.

4.4 Policy 2

Implement a graduated parking management approach, in a manner similar to the flow chart below.

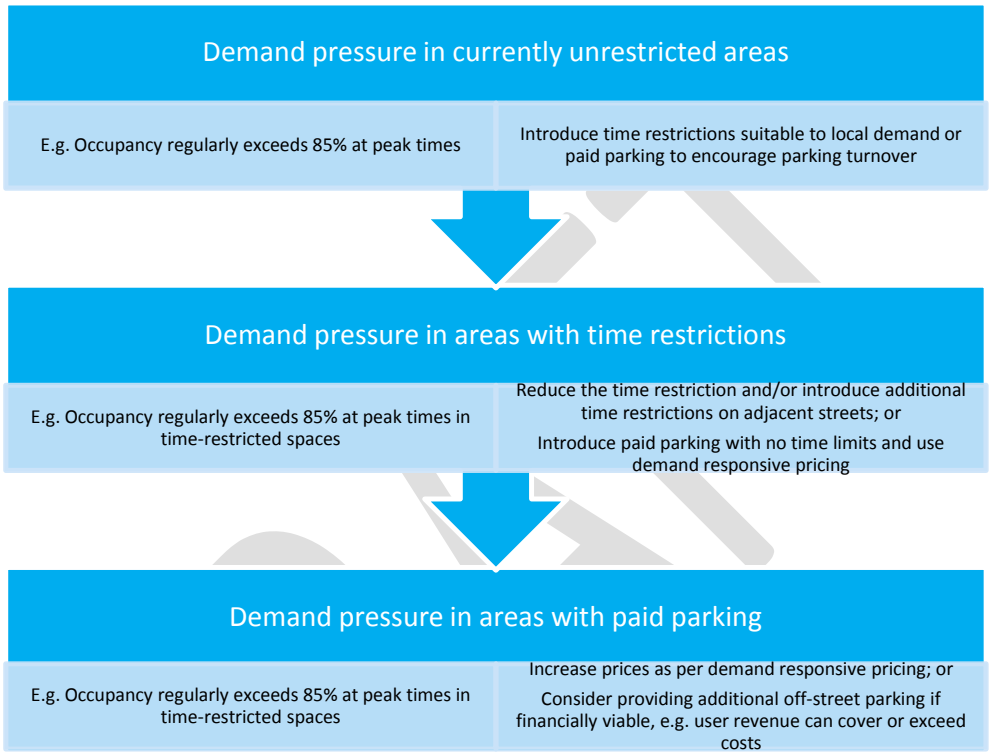

Figure 2: Graduated parking management approach in the city centre and suburban centres

4.5 Policy 3

Council-operated long stay parking should be limited and gradually repurposed from Hamilton's centres in favour of short-stay visitor parking, subject to demand for more short-stay parking. This includes the gradual removal of early bird parking, daily caps and all-day unrestricted parking in public parking areas. As part of the implementation of this policy, the area-specific Parking Management Action Plan should outline the service areas of key buses, and active transport routes such as cycle ways. The boundaries of these service areas can act as border points for the repurposing of such parking. Having more short-stay parking over long-stay parking provides better access to Hamilton's centres for visitors and shoppers. Where a market for long-stay commuter parking remains, private interests may meet that need.

4.6 Policy 4

Where pricing is implemented, ensure pricing for on-street parking exceeds that of off-street parking, to reflect the premium of kerbside space in the city centre and suburban centres. This price differential also disincentivises drivers cruising for parking on the street and the associated localised traffic congestion.

4.7 Policy 5

Consider adopting District Plan regulatory restrictions on transitory off-street car parks (e.g. on unformed surface sites) where centre amenity, vitality and travel mode objectives are adversely affected.

5 Residential Streets – Demand Management

5.1 Issues Addressed

1. The establishment of clusters of out-of-centre offices and businesses with poor access by public transport and active transport means most workers at these businesses must travel by car.
2. Most of these workers are required to park in suburban residential streets as there is insufficient on-site parking for everyone.
3. There are therefore competing demands for parking on residential streets between residents, visitors to local properties, and local workers.
4. The increase in parked cars from workers can also disturb the relatively quiet suburban residential amenity residents may previously have experienced.
5. High numbers of cars parked on residential streets near schools during pick-up and drop-off hours create localised congestion, unsafe parking and illegal parking problems.
6. Parking on narrow residential streets may obstruct both vehicle access to properties, and access by emergency or service vehicles.

5.2 Outcomes/Objectives

1. Demand pressures in residential streets are managed to ensure access by short-term visitors is prioritised during business hours, whilst ensuring a minimum acceptable level of suburban residential amenity is maintained at all other times.
2. Recognise that on-street parking on residential streets is a public resource available to everyone by ensuring no specific group of users are excluded from accessing this resource.
3. On narrow streets, priority must be given to access to properties and by emergency and service vehicles.
4. Safety on residential streets near schools is the foremost priority when managing parking.

5.3 Policy 1

The use of residential parking permit scheme (a scheme giving residents preferential on-street parking) to deal with parking pressures on residential streets is discouraged, as most residential properties can provide for their typical parking requirements on-site. For most dwellings in Hamilton outside of the city centre, on-site parking for at least 1-2 cars already exists due to the use of minimum parking requirements in the District Plan. In cases where a development has been approved without on-site parking, the city council should not subsidise parking for this development by providing residents-only parking.

Emphasise to developers and future residents that developments approved in areas following the date of removal of minimum parking requirements will not be eligible for residential parking permits.

In parts of Hamilton with heritage properties that either have no vehicle access or no parking on-site, discretion should be allowed to consider a residential parking permit scheme for such properties.

5.4 Policy 2

Any parking on residential streets should be provided in accordance with the kerbside management framework and residential parking hierarchy outlined under the *Citywide – Kerbside and Parking Hierarchies* section of this report.

5.5 Policy 3

Respond to demand for parking on residential streets in accordance with the following diagram:

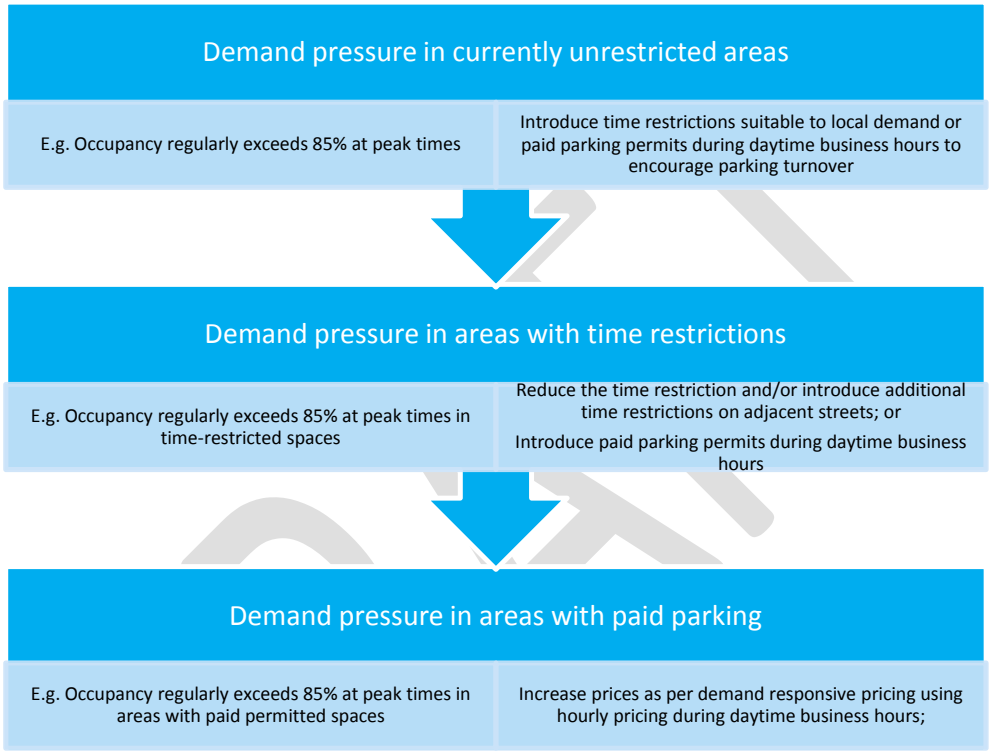

Figure 3: Graduated parking management approach on residential streets

The paid parking permits mentioned in the diagram above should be available to purchase by anyone, not just the residents. This allows those who need to park on residential streets with high demand and have a willingness to pay to have access these parking spaces (e.g. local workers, trade workers, visitors to residential properties) during daytime business hours.

5.6 Policy 4

On narrow streets, particularly residential streets with a width of 6.5m to 7m, priority for access to properties and emergency and service vehicle access is recommended. This can be achieved via painting 'No Stopping At All Times' (NSAAT) lines along one side of the street.

6 Using Parking Management to Support Public and Active Transport

6.1 Issues Addressed

1. Current parking management policies and pricing are not aligned with public transport and active transport mode shift goals as adopted by *Access Hamilton* and the *GPS*
2. The prevalence of lower cost parking products and the consequent underpricing of parking provide a disincentive to use public transport and active transport
3. Minimum parking requirements outside of the city centre continue to promote land use patterns that incentivise driving over using public transport and active transport

6.2 Outcomes/Objectives

1. Progressively remove priced parking products and parking subsidies in the city centre and city centre fringe that represent a cost disadvantage to use public transport and active transport
2. Review minimum parking requirements outside of the city centre with the view of supporting more compact and affordable land use patterns that support access by public transport and active transport
3. Investigate the use of financial surpluses from parking operations to fund infrastructure and services for public transport and active transport, in collaboration with Waikato Regional Council.

6.3 Policy 1

Council-operated long stay parking should be gradually removed from the city centre and suburban centres. This includes the removal of early bird parking, daily caps and all-day unrestricted parking. This removal should occur subject to growing demand for short-stay parking and public transport services.

6.4 Policy 2

Investigate the use of hypothecated funds sourced from parking surpluses to fund active and public transport projects, in collaboration with Waikato Regional Council. Ensure this is well communicated to the public.

6.5 Policy 3

Where possible, increases in parking prices and/or reduction in public parking supply should be coordinated with improvements to public transport and active transport facilities (e.g. new bus lanes) and services (e.g. frequency improvements). This policy requires coordination with Waikato Regional Council and should be well communicated to the public.

6.6 Policy 4

Investigate the removal of minimum parking requirements in suburban centres and medium/high density residential areas outside of the city centre at the next review of the Hamilton District Plan.

7 Park and Ride

7.1 Issues Addressed

1. People living in the outer parts of Hamilton or outside of Hamilton have limited or no access to Hamilton's public transport network (e.g. too far away to walk to a bus stop)
2. People with mobility issues may not be able to walk to public transport
3. Whilst in some situations Park and Ride can help increase public transport patronage, construction and operation of Park and Rides can be expensive and needs to be considered alongside other interventions to increase patronage
4. Park and Ride can attract existing and potential public transport customers who would otherwise have accessed a public transport stop by other modes (e.g. walking)
5. Land used for Park and Ride can have significant opportunity costs if there is development potential for the land to be used for other productive purposes
6. Park and Ride can create localised traffic congestion and parking issues
7. Park and Ride can generate localised environmental issues (e.g. noise, stormwater, visual)

7.2 Outcomes/Objectives

1. Invest in Park and Ride only where it would deliver net patronage gains and value for money compared to other ways of accessing public transport
2. Establish Park and Ride in locations where it intercepts traffic ahead of congested corridors
3. Manage on-street parking in the surrounding streets to mitigate overflow parking
4. Establish Park and Ride in low density and/or topographically challenging locations where the potential for walking or cycling to a public transport stop is low
5. Establish Park and Ride in locations with low development potential, and convert to other land uses where the value and development potential of the site increases in the future, especially where there will be greater net patronage gains
6. Manage Park and Ride in a way that prioritises access for people who need it the most
7. Manage and mitigate the adverse environmental effects of Park and Ride

7.3 Policy 1

New Park and Ride facilities should be developed and evaluated according to the criteria below.

Table 3: Principles and criteria for Park and Ride development

Integration with public transport	Located to connect with existing or planned rapid and frequent public transport services.
	Located in areas not accessed by connector buses or where bike or walking is note possible. Most suitable areas are lower density suburban areas or rural residential areas.
	Located before congested areas on the road network, where Park and Ride can intercept current car commuter trips.
Value for money	The benefits of developing a park and ride, should outweigh the costs of developing the facility.
	The net benefits of other access modes, such as connector bus services, high frequency bus services or improved walking and cycleways should be lower than the net benefits of the Park and Ride facility.
	Costs of using park and ride should be lower than driving for the whole journey and parking. This can include time and financial costs.
Alignment with land use and transport objectives	Not placed in an area with immediate interest in dense residential or mixed-use development.
	Located away from suburban centres/busy pedestrian areas.
	Ability to be converted to different land use in the future, including transit-oriented development.

7.4 Policy 2

It is recommended that Park and Ride facilities are managed to ensure availability of some spaces throughout the day to serve a broader market than only peak-hour commuters. This can be achieved through time limits on some spaces or pricing of spaces.

7.5 Policy 3

Park and Ride should be managed to ensure exclusive use for public transport passengers during bus operation times. This can be achieved through management techniques like requiring a validated travel card to use the Park and Ride or enforcement measures.

8 Electric vehicles, car share and autonomous vehicles

8.1 Issues Addressed

1. New and emerging vehicle technologies have a range of benefits, but their benefits are not equal in all locations and are often misunderstood
2. High vehicle ownership rates per individual and per household in Hamilton lead to higher vehicle kilometres travelled and associated negative congestion and pollution effects
3. Combustion vehicles contribute to air pollution and greenhouse gas emissions in Hamilton

8.2 Outcomes/Objectives

1. Facilitate car share schemes to reduce vehicle ownership rates and the amount of space required to park private cars
2. Ensure new parking buildings are prepared for the arrival of autonomous vehicles through innovative design standards
3. Provide for electric vehicle parking and associated charging infrastructure in a way that does not obstruct or impair pedestrian movements and safety

8.3 Policy 1

Allocate a portion of parking in key locations, including on-street and Council-run off-street carparks, to carpool parking and carshare vehicles. The use of kerbside space by these vehicles will be allocated in accordance with the kerbside hierarchy documented above.

8.4 Policy 2

Future-proof new parking buildings to accommodate autonomous vehicles and other uses should fewer buildings be required for parking in the future.

8.5 Policy 3

Enable electric car charging infrastructure to be installed at on-street public parking spaces where pedestrian movements and safety would not be impaired and investigate the feasibility of incorporating electric vehicle charging requirements for parking spaces in the District Plan.

9 Special Events/Sports fields/Outdoor Venues

9.1 Issues Addressed

1. Large gatherings at special events, sports fields, outdoor venues and other public places of assembly attract large numbers of vehicles that cause localised parking problems for a specific time period
2. These problems include unsafe parking, illegal parking and the parking demand exceeding supply.

9.2 Outcomes/Objectives

1. Provide for the enjoyment of large gatherings at special events and public places of assembly by ensuring travel demand management measures are adopted.
2. Encourage attendees to special events and large gatherings to make use of public transport and other sustainable transport options.

9.3 Policy 1

Work with event promoters to develop traffic management plans, including parking plans, for large events and gatherings of people. These could include but are not limited to sports events, concerts and markets.

9.4 Policy 2

Work with event promoters to include free public transport passes as part of event tickets and ensure sufficient public transport or charter bus services are provided to and from venues holding special events.

9.5 Policy 3

Develop parking restrictions, including timing or pricing, for the duration of special events. This can include special event parking zones and restricting parking on the streets surrounding venues for large events.

10 Parking Technology

10.1 Issues Addressed

1. Current parking payment methodology in the City Centre (e.g. two hours free parking without validation) does not coordinate well with smart parking technology and sensors installed.
2. Responsibility lies with Council to prove how long a car has been parked in the central city within the first two hours.
3. Despite the adoption of some updated parking technology, parking wardens are still manually enforcing parking limits in the central city.
4. New Parking Technology comes with the ability to enforce infringements more effectively, which may lead to public dissatisfaction due to their inability to adapt quickly

10.2 Outcomes/Objectives

1. Parking becomes first and foremost a compliance and education-based activity, with enforcement a final resort with the aid of technology
2. Parking technology should be used to realise desired outcomes and policies of the *Parking Management Plan,* the *Central City Transformation Plan*, existing neighbourhood plans, and *Access Hamilton*, but recognising that the technology applied can be adapted to any changing strategic outcomes
3. Innovate and trial new technologies in relation to monitoring, enforcement, sharing and use of parking that enable more efficient use of parking and more efficient parking operations

10.3 Policy 1

Introduce registration of parking events in the city centre, whereby drivers log the start of their parking time, either via the PayMyPark app or by using parking machines, even if parking is unpriced to produce reliable parking usage data for monitoring and surveying purposes.

10.4 Policy 2

Investigate and trial the use of License Plate Recognition technology, ideally mounted on vehicles as a means to both monitor parking compliance and undertake parking surveys for Council. This has potential beneficial outcomes for residential streets as there are insufficient numbers of wardens to monitor all residential suburbs. Subsequently adopt it if it proves to be an effective and efficient method of monitoring compliance and undertaking parking surveys.

10.5 Policy 3

Investigate and trial the use of License Plate Recognition technology in regard to the use of and payment for off-street parking areas

10.6 Policy 4

Consider amending regulatory requirements to allow sharing of private off-street parking resources between multiple users through the use of mobile and online applications

11 Criteria for Parking Management Action Plans

As part of the development of the Parking Management Plan, it has been signalled to the Access Hamilton Taskforce that there are several precincts in Hamilton that are priorities for Parking Management Action Plans (PMAP) to be implemented. These include the City Centre, City Centre Fringe, Frankton, Hospital, Hamilton East, University, Chartwell and Te Rapa. This initial list has been compiled in response to feedback received from staff, elected members and community groups.

Notwithstanding this initial list of priority areas, it is necessary to define when and where PMAPs may be implemented so that the policies of the Parking Management Plan can be applied to address the prevailing parking issues that exist in an area. To this end, the following criteria are proposed which act as 'triggers' for deciding when a PMAP should be prepared.

- Land use development or public works that result in the significant loss or redistribution of public parking, including transport and other infrastructure projects resulting in reallocation of kerbside space, and works requiring the preparation of a PMAP at the applicant's cost as part of the resource consent condition process;
- Significant loss or redistribution of public parking due to application of Parking Management Plan's policies (e.g. converting kerbside parking into other higher priority uses); or
- Requests from the public, schools, business associations, community groups, iwi or councillors due to demonstrable parking issues.

In terms of the methodology and contents of the PMAPs, an advice note will be prepared following the adoption of the Parking Management Plan and can be used as a blueprint for all future PMAPs.

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Hamilton Parking Management Plan - Summary of Technical Evidence

Draft

Prepared for: Hamilton City Council

Prepared by: MRCagney Pty Ltd, Auckland, New Zealand

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1 Introduction

Hamilton City Council ('HCC') has commissioned MRCagney to assist with the development of a Parking Management Plan for the city, to act as a strategic document to outline the HCC approach to providing and managing parking, both on and off-street, across the entire city.

In developing this strategy, there is a need to understand the key challenges in the area of parking in Hamilton and provide an evidence base for solutions to these problems or difficulties.

The following document is a summary of the evidence base and experience used to support the policy directions outlined in the Parking Management Plan.

The evidence provided in this document has come from a review of relevant literature and parking survey data, as well as by drawing on MRCagney's experience in the field of parking management and policy.

Identification of parking challenges in Hamilton has come from internal discussions within HCC, discussions between HCC and MRCagney and stakeholder engagement, as well as a review of recent parking survey data from sensors located in the city centre.

2 Hamilton City Centre Parking Sensor Data

The average parking occupancy between 10am-4pm on weekdays for Hamilton's city centre from February 2018 to February 2019 is shown in Figure 1 below[1].

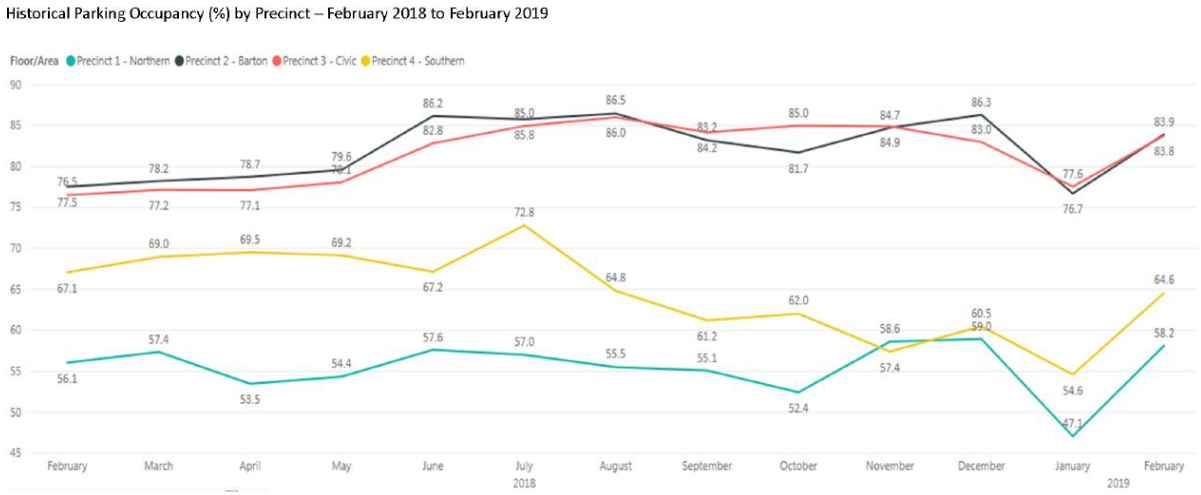


Figure 1: Average parking occupancy for Hamilton City Centre, February 2018 to February 2019.

The corresponding map showing the location of the precincts and a 'hotspot' analysis of occupancy is shown in Figure 2 below.

[1] Figure sourced from Hamilton City Council.

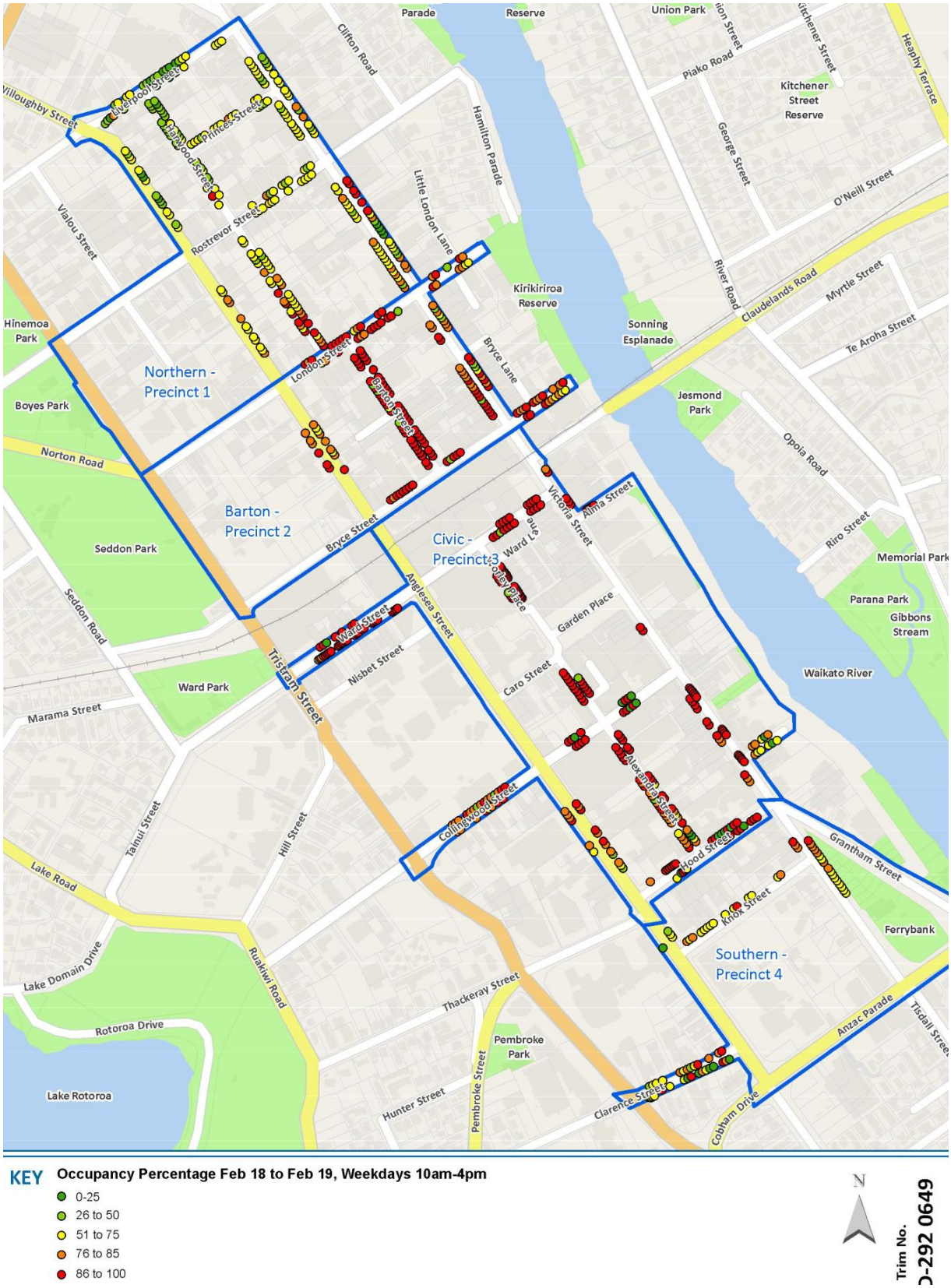


Figure 2: Precinct map and average parking occupancy hotspot map. Source: Hamilton City Council

As demonstrated by these figures, the average parking occupancy for weekdays between 10am-4pm for Precincts 2 and 3, which are in the core of the city centre, hovered around an 'optimal' level of 85% (i.e. it ranged from 77% to 87%). This meant that on average across those six hours around 1 in 7 spaces were available to drivers looking for a parking space. Notwithstanding this result, if average occupancy was measured based on the mean of the four hours with the highest occupancies (known as 'average peak occupancy'), which is a metric we prefer as it eliminates outliers, then the average occupancy levels would likely be higher, perhaps reaching or exceeding 90% for certain streets and/or the whole of Precincts 2 and 3. This suspicion would need to be verified by more detailed analysis, including analyses of average dwell times. If occupancy reached or exceeded 90% 'average peak occupancy', then it is surmised that users may experience difficulties in locating an on-street parking space within Precincts 2 and 3 during peak periods.

In contrast, Precincts 1 and 4 on the outer edges of the city centre experience an underutilisation of on-street parking, with average occupancy ranging from 47% (seasonal low in January) to 72% over the same period. It is worth noting that the same pricing regime applies across all four precincts; so, the pricing may be too expensive for Precincts 1 and 4 but potentially not sufficiently expensive for Precincts 2 and 3 to encourage a desirable level of parking availability.

Note: there is no published data available for Saturdays and Sundays, or for the council-controlled off-street parking.

3 Parking Management in City Centre and Major Centres

3.1 Literature review

New Zealand cities face several challenges and opportunities in the management of parking in major centres including high parking demand, the need to manage different types of parking as well as supporting the business needs and increasingly encouraging more people to bus, bike or walk to their destination.
To address these challenges and opportunities, cities use a variety of parking management techniques including time limits, pricing, and prioritisation of both length and type of parking. The purpose of this literature review is therefore to present the academic or technical research on some of these practices and seek to identify whether they have a demonstrable effect on economic outcomes for shopping districts.

3.1.1 Mode share, spending per mode and attracting visitors to centres

Studies conducted in key shopping streets in Auckland, Wellington and Christchurch[2] as well as various town centres throughout London[3] looked at visitor spending profiles by mode to assess the potential impact of road space reallocation away from car-based uses (e.g. road lanes and parking lanes) to support sustainable modes such as footpaths, bus stops, and bicycle parking. Key results showed that:

- shoppers using sustainable modes have a similar spend profile to shoppers that arrive by car. They visit more frequently than car users and therefore may have a higher spend over time.
- Shoppers using sustainable modes may be more desirable to attract when space limitations and the cost of providing parking is considered. The cost and space required to provide access for one person arriving by bus or bike, is much lower than that required for car parking spaces.
- Providing space for sustainable modes costs less than the cost and space required to provide parking spaces for people to arrive by car. However, measures that favour public space allocation to bus stops, cycle parking or public space over car parks are most effective when they are part of a holistic package of interventions to improve a shopping area and encourage trips by sustainable transport modes.
- Because it is more *space efficient* to cater for sustainable transport users as highlighted by the preceding point, arguably more priority of road space should be given to such users in town centres and city centres (e.g. wider footpaths, cycle parking, bus stops, on space otherwise occupied by on-street parking), as that will lead to higher spending per amount of public land allocated to the different types of road users over time.
- While retailers considered parking as the most important design feature to attract shoppers, results showed that shoppers were more concerned about a safe and attractive shopping experience including the shops available, pedestrian crossings, wide footpaths and frequency of bus services.

[2] Fleming (Allatt), T, S Turner and L Tarjomi (2013) Reallocation of road space. *NZ Transport Agency research report* 530. 291pp.
[3] Accent (2013) Town Centres 2013. London: Accent

3.1.2 Effect of road space reallocation projects on shopping areas

Reallocating road space from parking to other uses that improve the public realm such as walkable and safe cycling streets with slow speeds, and cycle parking can have ***potential*** economic benefits to city centres and town centres. However, the benefits of road allocation are dependent on people cycling, walking or taking the bus to town and city centres. For instance, Fort Street's shared space in Auckland has been a success story not only because of the works on the street itself, but because efforts by the Council over many years in improving the public transport network so that it is easy to go into Auckland's city centre without a car. The table below outlines the impacts of selected road space reallocation projects in New Zealand cities[4].

Table 1: Impacts of road space re-allocation projects in New Zealand

Location	Road Reallocation Strategy	Outcomes
Fort Street, Auckland	In 2013 Fort Street became a shared space which prioritised pedestrians and cyclists. All kerbside parking was removed with exemptions for police vehicles and 5-minute loading and deliveries 6am-11-am.	A 2018 study showed increases of 429% in hospitality spend; 47% in consumer spend and 50% more pedestrians in peak hours. There were also 25% less vehicles and a 2 to 8 km/hour reduction in average vehicle speed[5]
Lower Cuba Street, Wellington	In 2011, Lower Cuba Street became a shared space where pedestrians have the right of way and parking for all types of vehicles was reduced by approximately 50%.	A post evaluation study showed that perceptions were positive, but pedestrians believed the roadway was primarily for vehicles indicating that the design did not meet its goals and is not good practice. Retail spend post implementation increased slightly at 5.9% higher relative to the rest of the CBD[6] and attracted a greater mix of businesses to the area.
Lygon Street, Melbourne	A 2010 study investigated the economic benefit of reallocating some car parking space to bike parking in this Melbourne main street[7]. They estimated that each square metre of space allocated to cars yields only $6 per hour in expenditure, whereas each square metre of space allocated to bicycles yields five times as much at $31 per hour.[8]	In 2008, two car parking spaces were replaced with parking for 12 bikes and expenditure per square metre increased from $156 per hour to approx. $565 per hour. Incrementally reallocating on-street parking to bike parking provides economic benefit but has diminishing marginal returns and requires an existing cycling population and catchment.

It is worth noting that diminishing marginal returns apply to road space reallocation; that is, the wholesale removal of parking to other uses would likely lead to detrimental economic outcomes for centres. Rather, a gradual reallocation to other uses commensurate with demand is recommended by Lee and March (2010). The same applies to using space for parking; allocating large swathes of a street to parking alone is also not recommended as each additional parking space provided would yield diminishing marginal benefits.

3.1.3 Effects of parking pricing and availability on shopping areas

Retailers frequently oppose the introduction of priced parking because they believe that it will drive customers away to other locations where parking is unpriced. However, parking expert Donald Shoup contends that parking priced at an optimal level increases parking space turnover in streets with high parking demand, increases parking availability, and reduces the level of cruising for parking the corollary of which is increased

[4] Powell, F, C Bowie, L Halsted, J Beetham and L Baker (2015) The costs and benefits of inner city parking vis-à-vis network optimisation. *NZ Transport Agency research report 575*. 117pp.
[5] Auckland Council (2018) *Share the Wealth Shared Spaces Make great Business Places*. Available at: http://content.aucklanddesignmanual.co.nz/resources/case-studies/street_fort_street_precinct/Documents/ADM%20Case%20Study%20Fort%20Street%20Precinct%20Auckland.pdf Accessed 9 November 2018
[6] Robertson (2013) *Lower Cuba Street Upgrade Outcomes Evaluation* Wellington: Wellington City Council
[7] Lee, A. and March, A. (2010) Recognising the economic role of bikes: sharing parking in Lygon Street, Carlton, *Australian Planner*, 47(2), 85-93,
[8] Based on a bicycle parking space area of 1.5 m^2 and a car parking space area of 13 m^2.

customer flow for retailers.[9] . Hymel (2014)[10] found that a flat pricing structure did not increase customer flow and hence retail sales in Long Beach, California where suboptimal pricing contributed to both decreasing customer flow during periods of low parking demand (i.e. the parking is too expensive) and had little effect on increasing parking turnover and customer flow during periods of high demand (i.e. the parking is too cheap). The findings of this study support the case for more flexible parking fees and the use of technology to allow the parking fee to vary flexibly according to the demand, time, and location.

Mingardo and van Meerkerk (2012) analysed the statistical relationship between retail turnover and parking capacity, parking fees and sales floor surface (SFS) area using a database of 80 different shopping areas in the Netherlands.[11] They found that higher parking fees are associated with shopping areas with higher retail turnover per SFS m^2. In the most attractive shopping areas customers are willing to compete for parking which is a scarce good and thus can be charged. The study also found that while there wasn't an overall relationship between parking capacity and retail turnover, it did seem to have an impact for a subset of "regional shopping areas". The explanation for this relationship is that these kinds of shopping areas tend to attract visitors from a larger catchment so the ability to park a car has an influence on retail turnover. Examples of such regional shopping areas in the New Zealand context would be large shopping centres such as The Base in Hamilton or Sylvia Park in Auckland.

3.1.4 The optimal parking occupancy rate to manage parking demand

In the industry-defining and seminal book *The High Cost of Free Parking*, Donald Shoup introduced the concept of the 85% occupancy rate as an ideal occupancy for cities to strive for in their management of public parking.[12] Ensuring that approximately 1 in 7 parking spaces are free on a street or in a car park means that: the parking resource is sufficiently utilised to maximise the use of the asset; nearby shops or services are well frequented; and drivers are able to find a parking space with relative ease. Cities throughout the world have formalised the 85% occupancy rate in their transport and parking strategies/plans including Auckland, Wellington, Hamilton and Christchurch.

However, some are critical that Shoup (2005) proposes setting street-block and time-specific priced parking rates so that an average parking occupancy rate of 85% is realised without enough variation allowed for changes in the time of the day or parking demand. Indeed, there is a question mark about whether the 85% occupancy target even remains relevant. Arnott (2014)[13] presents a useful critique of this occupancy target and posits that the optimal target occupancy rate should not be constant over time and space. Arnott (2014) does not empirically prove what the target rate should be according to changes in time, traffic, and other conditions, but it presents a range of other factors that should be considered in determining the rate, such as:

- Vehicular traffic congestion conditions;
- The availability of off-street parking;
- The extent of cruising for car parking

Arnott asserts that considering the above factors, the optimal occupancy rate is likely to be higher at busier locations and at busier times. Setting a higher occupancy target that is well publicised can achieve city objectives of making individual streets less car centric. Techniques that could be used for publicising the occupancy could be real time electronic parking occupancy boards following 'P-Routes' through a city

[9] Shoup, D. (2006) Cruising for Parking *Transport Policy* 13(6), 479-486.
[10] Hymel, K. (2014) Do parking fees affect retail sales? Evidence from Starbucks *Economics of Transportation* 3, 221-233
[11] Mingardo, G. and van Meerkerk, J. (2012) Is parking supply related to turnover of shopping areas? The case of the Netherlands *Journal of Retailing and Consumer Services* 19, 195-201
[12] Shoup, D. (2005) *The High Cost of Free Parking* Planners Press, American Planning Association, Chicago
[13] Arnott, R. (2014). On the optimal target curbside parking occupancy rate. *Economics of Transportation*, 3(2), 133-144

pointing at car parking areas/garages with real-time capacity, or as part of a widespread public communications strategy.

Furthermore, the advent of advanced parking and mobile application technologies means the 85% occupancy target has been implemented in a more granular fashion, with schemes such as *SFPark* in San Francisco able to vary the price automatically according to demand to realise this target. In Auckland, policy measures allow Auckland Transport to change the price of parking after only seven days' notice. Given the flexibility afforded by technology and public policy, it means that the ability to adjust the parking occupancy target by location, by time, and by other conditions becomes easier for councils that manage public parking.

3.2 Parking management practices in other cities

The following table provides a summary of the parking management methods employed by other cities around New Zealand.

Table 2: Summary of parking management practices in other cities

Location	Summary of Strategy

Auckland	• The *Auckland Parking Strategy* (2015) supports the urban form and amenity outcomes from the higher-order strategic Auckland Plan and Auckland Unitary Plan.
	• **The 'City Centre Parking Zone'** (CCPZ) element of the strategy has been in place since 2012 to respond to capacity and length of occupancy issues. Key elements include:
	  ○ removal of time limits for on-street parking
	  ○ demand responsive pricing to manage demand
	  ○ a 10-minute grace period so no payment required for short stops
	  ○ lower hourly rates in car park buildings to shift parking off-street.
	• Early bird parking has also been discontinued at city centre parking buildings to discourage commuter parking, free-up space for short stay parking and support public transport patronage – one of the Strategy's objectives[14].
	• **Demand responsive parking** in the city and town centres prices on-street parking so that people can find a park within walking distance of their destination. Parking is regularly monitored to ensure prices are resulting in an appropriate level of occupancy (85%). Prices and times of operation can vary. Businesses and local boards are given seven days' notice of any proposed changes but there is no public consultation required.
	• **In Auckland's town centres,** the management of on-street parking follows a simple graduated approach.
	  ○ Excess demand in areas with no parking restrictions will be addressed through the introduction of time limits or paid parking
	  ○ Excess demand in areas with time restrictions will be addressed through additional geographic time restrictions or a reduced time limit and or; paid parking and demand responsive pricing
	  ○ Excess demand in areas with paid parking will be addressed through increased prices or the provision of additional off-street parking in line with investment criteria
	• AT also manages off-street assets in town centres to support mode shift to public transport.

Wellington	• The *Wellington City Council Parking Policy* (2007) outlines policies for the management and supply of parking in the city centre and suburban centres of Wellington City. Unlike the Auckland example, it does not contain recommended management techniques to realise these policies.
	• **In the Central Area:**
	  ○ on-street parking supports retail and entertainment facilities, servicing for commercial and professional activities, community recreational facilities and events. Commuter residents' parking are not prioritised;
	  ○ Road space on main roads at peak times should be prioritised for the movement of people to, from and through the city centre;
	  ○ The Golden Mile will be designed as a corridor for public transport, walking and cycling, with parking not a priority;
	  ○ Council will collaborate with private operators to provide off-street parking, including shared parking arrangements, as well as support the use of off-street car parks for alternative uses (e.g. markets).
	• **In Suburban Areas:**
	  ○ On-street parking supports retail and entertainment facilities, servicing for commercial and professional activities, community recreational facilities and events, but must be balanced against the needs of surrounding residents and commuters;
	  ○ A 15% vacancy rate will be used to measure the effectiveness of the Council's management of parking;

[14] Stuff (2014). *Auckland Transport cans early bird parking*. Available at: https://www.stuff.co.nz/business/industries/63295772/auckland-transport-cans-early-bird-parking Accessed: 8 November 2008

	○ Road space on main roads at peak times should be prioritised for the movement of people and passenger transport to, from and through the suburban centres
Christchurch	• The *Christchurch Central parking Plan* documents the current availability of car parking in the city centre and provides direction on the future management and supply of parking in the **city centre** guided by the following principles: ○ Provide parking to support economic vitality and prioritise public short stay parking to support businesses. Council facilities will satisfy short-stay parking requirements while on-street parking will be reduced compared to the pre-earthquake situation; ○ Locate parking buildings to minimise conflicts with other modes and minimise vehicle movements in the core; ○ Manage parking to achieve high utilisation (variable pricing and promoting shared parking) and incorporate smart technology where appropriate (such as electric charging). • The draft *Suburban Car Parking Policy* sets out a priority order for kerbside use in different contexts. **In town centres**, bicycle parking, bus stops, taxi stands, loading zones, and mobility parking are a higher priority than general parking • The Council is also seeking feedback on whether it should set time limits for parking or introduce paid metered parking as part of a graduated approach like Auckland.
Lower Hutt	• Lower Hutt's *Parking Policy* (2017) takes a hierarchical approach to the prioritisation of on-street parking like that proposed in Christchurch's *Suburban Car Parking Policy*. • In commercial and retail areas, bus stops, mobility parking, using carriageway space for walking/cycling infrastructure, streetscape features, drop off and pick up spaces, and loading zones, are all prioritised over short-stay parking. Short stay parking retains higher priority over longer term parking. • The policy affords greater importance to public transport, active transport, and people-friendly streetscape features as ways to attract more people to shop in Lower Hutt's retail and commercial areas. It also recognises the relationship between parking management and the use of alternative modes. • To give effect to the hierarchy of road space uses, the policy contains the following interventions available to Council: ○ Reallocating space used by on-street parking for higher priority uses; ○ Pricing and time restrictions to achieve a peak time occupancy rate of 85% for on-street parking; and ○ Changing the management technique if occupancy rate regularly exceeds 85%

3.3 Key findings from the review of other cities

Some common themes from the review of other cities parking management practices include:

- Using parking management to drive mode shift to other transport modes, e.g. by removing or reducing long-stay commuter parking in centres and by removing cheap parking prices for long-stay parking (e.g. early bird).
- Adopting a graduated parking management approach to prioritise short-stay visitor parking, with the use of time limits and subsequently adjustable pricing to ensure an occupancy rate of around 85% and to ensure high turnover.
- Setting out a clear hierarchy of road space priority depending on the location (e.g. city centre, town centre, other areas), to define the relative importance of on-street parking compared to other uses of road space (e.g. footpath space, bus stops, cycle lanes, loading zones, etc.).
- In the Auckland and Christchurch city centres, short-stay visitor parking is directed towards parking buildings, which ties in with the reduction of long-stay parking in these buildings and has the added benefit of freeing up street space for other purposes.

4 Residential Parking

A review of the literature has found a general discouragement of the use of residential parking permits as an answer to residential parking pressures.

Three studies (Moylan et al. 2014; van Ommeren et al. 2013; de Groote et al. 2015), all reviewed the effects of residential parking schemes in particular neighbourhoods in North America, London and the Netherlands respectively [15] [16] [17].

Between them, the papers found the residential parking schemes promoted an inefficient use of on-street parking by the following means:

- **Excluding those who have a genuine need to park on residential streets**, such as local workers, in favour of providing parking for residents. In Berkley, California, non-residents could park for a maximum of two hours, but residents with a permit could park for unlimited amounts of time. Only 17% of surveyed street blocks met the target occupancy of 75% when enforced. Additionally, non-resident users were, on average, staying longer than permitted. Both outcomes reflect an inefficient use of the parking, caused by residential restrictions.
- **Permit holders having parking subsidised by other users or local authorities.** In the Borough of Kensington and Chelsea in London, 28% of 34,000 on-street parking spaces are only available to residential permit holders, but more than 34,000 permits are issued. A permit costs residents £0.30 per day, while non-residents pay £30 per day to park in the area – the true market value of a parking space in the area. Through this system, non-residents are subsidising cheap parking for local residents. Likewise, a study of residential parking permits issued in popular shopping areas in the Netherlands suggested a deadweight loss of about €500 (to the parking local authority) per residential parking permit – due to each space not being priced to reflect demand. Instead, Van Ommeren et al. (2013) suggest a tradeable permit system, creating a market reflecting users' (resident or otherwise) willingness to pay for parking.

By requiring non-residents to subsidise residential parking in high-demand areas, the scheme contributes to inequity. De Groote et al. (2015) found residential parking permits to be mostly beneficial to high-income households, living in expensive areas, who could afford a car. This makes the policy not only inefficient, but also income-regressive.

4.1 Practices in other cities

4.1.1 Auckland

Residential parking pressure affects Auckland suburbs where heritage houses were built without on-site parking. In suburbs in the city fringe, residents are competing with commuters parking in the area who take

[15] Moylan, E., Schabas, M. & Deakin, E. (2014) Residential Permit Parking Better Off Without it? *Transportation Research Record: Journal of the Transportation Research Board, No. 2469, Transportation Research Board of the National Academies, Washington*
[16] van Ommeren, J; de Groote, J; Mingardo, G (2013) Residential Parking Permits and Parking Supply, Tinbergen Institute Discussion Paper, No.13-059/VIII, Tinbergen Institute, Amsterdam and Rotterdam,
[17] de Groote, Jesper; van Ommeren, Jos N.; Koster, Hans R.A. (2015) : Car Ownership and Residential Parking Subsidies: Evidence from Amsterdam, Tinbergen Institute Discussion Paper, No. 15-116/VIII, Tinbergen Institute, Amsterdam and Rotterdam

advantage of the nearby frequent public transport networks, as well as workers with workplaces in the city fringe.

In these suburbs, residential parking zones are considered, and put in place when occupancy is regularly above 85% at peak times[18]. Visitors in these zones can park for a maximum of two hours, and those wishing to park for longer must apply for a residential parking permit – renewed annually. The permit does not guarantee a car park and there is a cap on the number of permits issued. Permits are issued in order of priority for land use in the area, and houses with the least off-street parking given highest priority.

Residential parking permits are not issued to properties built after the release of the Unitary Plan (2013), to prevent the cost of parking being handed to AT by developers. Residential parking zones are generally not used in suburbs beyond the city fringe, where properties typically have on-site parking. These areas are instead managed with P120 time restrictions where required.

4.1.2 Wellington

Wellington's *Wellington City Council Parking Policy* (2007) discusses the issue of balancing resident parking in city centre fringe suburbs with the needs to other users (commuters, retailers, community etc.), but has little detail about specific management approaches.

Wellington has long used a mix of 'coupon parking' and resident parking schemes. Coupon parking is used in some city fringe suburbs. On weekdays from 8am to 6pm, any car can park in the zone for free for up to two hours. Those wishing to park for longer must buy a daily or monthly coupon via an app, from retailers or from the Council.

Other city fringe suburbs use resident parking zones, and some overlap with coupon zones. In these zones, only residents of those zone are eligible for a permit, with a maximum of two permits per household, or one in a multi-unit development. The fees are the same as in Auckland. The City Council demarcates specific spaces on the street for residents only.

4.1.3 Christchurch

Christchurch faces similar issues to Auckland and Wellington, but additionally has some unique issues. Including:

- High parking demand in residential streets near commercial areas/office parks, following a shift of many businesses out of the central city post-earthquake;
- On-street parking being used by private businesses (such as mechanics or car dealers storing cars on the street).

The city is currently reviewing consultation feedback on a draft *Suburban Car Parking Policy*[19] which proposes solutions to address the issues. Solutions are similar to resident parking and coupon zones in Auckland and Wellington, but other ideas include various combinations of time limits, resident-only parking and metered parking.

[18] Defined by Auckland Transport as the four hours with the highest occupancy in a day, irrespective of the time of the day
[19] https://www.ccc.govt.nz/the-council/consultations-and-submissions/haveyoursay/show/193

4.1.4 Dunedin

Dunedin has had a residents' parking scheme since 1991, which has gone through several changes. The city faces the same issues of commuters and residents competing for the same spaces.

Currently, a resident parking zone limited to the residential areas surrounding the city centre is in place. This covers an area typified by heritage dwellings without on-site parking and/or vehicle access. Only residents of dwellings without an on-site car park can apply for resident parking permits. The permits are limited in number, on a first-come-first-served basis, renewed annually for a fee and there is a maximum of one per household.

4.1.5 Other cities

Other, smaller cities in New Zealand, such as Lower Hutt or Whangārei, have not put measures like residential permits or zones in place. This is believed to be related to the development of these cities generally in the post-World War II period, when minimum parking requirements and the rise of car ownership meant dwellings were built with on-site parking, meaning residents are generally able to store their cars on-site.

5 Using Parking to Support PT and Active Transport

National strategic policy documents such as the Government Policy Statement on Land Transport (GPS 2018) highlight the need for car parking supply and management to be dealt with in an integrated manner when making investments to improve the levels of public transport and active mode use. This section discusses how car parking supply and management can be used to support the uptake of public transport and active transport modes with a specific focus on how to manage space that is already allocated for car parking. It will also investigate ways in which other locations around New Zealand and internationally have managed parking to influence mode share, particularly in favour of public transport, in their urban areas.

The GPS 2018 outlines the Government's strategic priorities and objectives that will guide land transport investment over the next 10 years. One of the main themes outlined in the GPS 2018 is to take a mode-neutral approach to transport planning and investment decisions – considering all transport options when identifying the best value for money transport solutions to deliver outcomes. The GPS notes that a high level of dependency on private motor vehicles results in high transport costs for many New Zealanders, higher greenhouse emissions and increased congestion in our larger urban areas and supports a shift to active modes and public transport. The GPS 2018 further states that the Government will investigate any regulatory barriers to the uptake and delivery of public transport, walking and cycling in New Zealand. This includes **better management of car parking to reduce subsidies for private vehicle trips** [emphasis added].

5.1 Literature Review

This section provides a targeted literature review on parking management strategies and their effect on the provision and modal share of public transport and active modes.

5.1.1 On-Street Parking Pricing

There have been several studies into the optimal supply and pricing of on-street parking from a perspective of economic efficiency. Generally, the studies recognise the dependencies between the off-street and on-street parking markets. Parking is considered competitive when the price is set by the market and non-competitive when the price is set below the resource cost of providing the parking.

Calthrop and Proost (2002) note that the amount of on-street searching behaviour (cruising for parking) depends on both the on-street and off-street price of parking and demonstrate that the off-street supply conditions have important implications for the pricing of on-street parking. Arnott (2005) applies a parking model that integrates traffic congestion and saturated on-street parking. The results show that to eliminate cruising for parking without parking becoming unsaturated, raising on-street parking fees is the primary strategy followed by increasing the amount of kerbside space allocated to parking. However, there is a cost involved in providing additional on-street parking and this potentially crowds-out other high value uses such as pedestrian space and amenities, cycleways, or transit lanes.

Calthrop and Proost (2002) stress in their findings that the supply of urban off-street parking is optimal if the price of on-street parking is greater than the resource cost of off-street parking. In other words, the user fees for on-street parking should be greater than the user fees for off-street parking to reflect a convenience factor. Interestingly, the findings also stress that the common regulatory alternative to pricing, i.e. free parking with a simple time restriction, is not efficient even when set optimally, as this induces too many drivers to search for an on-street car park.

5.1.2 Minimum Parking Requirements

Research shows that minimum parking requirements (MPRs) tend to result in an oversupply of off-street parking relative to what would occur in their absence[20]. This regulated oversupply also means that parking is typically provided to users at a price below the cost to produce it. A study undertaken by MRCagney to support the Auckland Council approach of reducing or removing MPRs in the Auckland Unitary Plan[21] found that:

- Minimum parking requirements can be understood as a regulatory intervention (i.e. public policy) that seeks to increase the supply of parking above what would otherwise be provided by new developments.
- The suggested advantages of MPRs are that they 1) make it easier for people to find a park and thereby alleviate localised congestion associated with searching for car parks and 2) reduce the need for local government to monitor/manage public parking.
- Regarding the overall economic impacts (costs and benefits) of MPRs, the study finds that:
    i. MPRs act like a tax on floor space that squeeze out alternative activities and thereby contribute to higher costs of living (for residents) and lower commercial property values.
    ii. Minimums will tend to constrain the development potential of individual sites and ultimately the wider urban area (i.e. contribute to urban sprawl), while stimulating higher levels of vehicle use.
    iii. In London, the removal of MPRs and the application of maximums were found to cause a 46% reduction in the level of parking provided with new developments. This implies that developers found there is a large market for new developments with less car parking. 98% of the reduction in parking was found to be attributable to the removal of MPRs.

An argument commonly expressed for maintaining MPRs in district plans is that developers will rely on public parking in the general area to provide for the accessibility needs of their development. However, a good Council parking strategy can play a useful role in informing developers on the likely availability and cost of accessing public parking into the future. Parking management techniques adopted by other cities and reviewed by the academic literature were covered in Section 1.

The lower parking prices resulting from MPRs in turn encourage people to travel by car[22] rather than by public transport or active transport. Removing MPRs tends to result in more efficient use of land during development and results in more intensive development, i.e. a higher proportion of the development capital and / or floor area of the development is used for commercial or residential purposes. This supports more compact urban form and further improves the viability and attractiveness of public transport, walking and cycling.

5.1.3 Maximum Parking Requirements

Maximum parking requirements aim to reduce the supply of parking below what would normally be provided by developers if they were free to choose the amount of ancillary parking for their development. MRCagney outlines the costs and benefits of this policy in a report assessing the effects of the Auckland Unitary Plan car

[20] Refer to the working paper prepared for the New Zealand Association of Economists 2015 Conference '*A Microeconomic Framework for Evaluating Parking Requirements*', Stuart Donovan and Peter Nunns: https://www.nzae.org.nz/events/nzae-conference-2015/2015-conference-papers/
[21] Refer to the report *'The Economic Impacts of Parking Requirements in Auckland'* included in the section 32 analysis for the Proposed Auckland Unitary Plan: https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/history-unitary-plan/documentssection32reportproposedaup/appendix-3-9-13.pdf
[22] See also (Litman, 2009, Shoup, 2005, Willson, 2013 for study of this relationship.

parking provisions[23]. The expected reduction in congestion benefits not only those who continue to drive but also bus passengers, and pedestrians who benefit from a safer and improved walking environment. However, developers are subject to a regulation that constrains their ability to supply parking at a level that they consider to best meet the market demand.

Vehicular congestion is a significant economic burden on society whose costs are largely external to the decisions of individual developments. Without policy intervention, individual developments have no incentive to reduce the level of car-parking they provide, even though it may be in societies' best interest to do so. If all new developments were subject to the same rules around the maximum level of car parking that they can provide then the negative effects on any individual development would be relatively small. In this context, well-considered regulation that reduces the level of car parking supply for every development in a relatively transparent and comprehensive way may be an effective policy for reducing congestion while avoiding adversely impacting on the competitiveness of individual developments. However, it is also important to consider whether parking policy is the most appropriate way to manage congestion impacts, as time-of-use road pricing may have a more direct influence in this area.

5.2 Practices in other Cities

This section will outline the steps that some cities have taken to use parking policies to support the uptake of public transport and active modes.

5.2.1 Auckland

The Auckland Region takes a pro-active approach to the management of car parking to support public transport use and active transport. The *Auckland Transport Parking Strategy* (2015) recognises that *'the availability and cost of car parking can influence decisions on the transport mode used, congestion, travel time and, potentially, the choice of destination'* and includes an objective to **facilitate a transformational shift to public transport**. The supporting policies include:

- Using demand responsive priced parking for on-street and public off-street car parking.
- Prioritising short-stay car parking users (shoppers and service users) in town centres
- Adjusting prices gradually and being transparent about how prices will be set.
- Setting revenue yield targets to prioritise short-stay parking, and to discount parking products that achieve specific travel demand management outcomes, such as car-pooling or off-peak travel.
- Extending clearways or removing car parking on arterial roads where it causes congestion, impacts the speed and reliability of public transport or causes safety risks for cyclists.
- Implementing Travel Demand Management initiatives in employment areas outside town centres including the use of park and ride in appropriate locations.

Auckland also recognises that existing off-street car parking site may have a more productive alternative uses, and in several town centres underutilised car parking sites have been divested for redevelopment or converted to other uses to contribute to a more vibrant town centre and stimulate other development in the area. [24].

[23] Refer to *'The Economic Impacts of Parking Requirements in Auckland'*, MRCagney August 2013. https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/history-unitary-plan/documentssection32reportproposedaup/appendix-3-9-13.pdf
[24] Refer to Policy 2D: Divestment in Off-Street Parking, Auckland Transport Parking Strategy 2015

The types of policies contained in the strategy have been implemented within the Auckland City Centre for over 20 years, alongside major investment in public transport infrastructure, and use of public transport and active modes has steadily increased over this period. The increase in trips to the city since 2001 have primarily been accommodated by public transport and active modes while public car parking occupancy rates have trended down over this time.

It should be noted that the Auckland Unitary Plan imposes a policy of maximum car parking requirements in the Auckland City Centre, and non-ancillary car parking facilities are either non-complying activities (long-stay) or discretionary activities (short-stay)[25]. This in effect can create a cap on the number of car parks able to be established in the city centre and avoids induced demand and associated congestion that might otherwise occur from an over-supply of parking spaces. The value of car parks also increases as supply is constrained, and the higher parking fees discourage private vehicle trips to the city centre, thus promoting public transport and active travel modes.

5.2.2 Queenstown

Queenstown Lakes has recently been experiencing significant growth pressure, resulting in concerns around road congestion, car parking and reduced amenity within the town centres: an estimated 30% of the traffic congestion comes from people searching for parking spaces.

In response, the District and Regional Council established a new frequent bus network with a subsidised $2.00 flat fare, increased car parking fees, limited free car parking and removed all long-term commuter parking price products from the Queenstown Town Centre[26]. Since implementation, bus ridership has grown strongly with an estimated 153% increase in the first six months of 2018 compared to the same period in 2017. Parking revenue has also exceeded the expected return[27] and the Council has committed to investing this surplus in additional efforts to get people out of their cars including bus improvements and comprehensive new public transport network maps.

This example demonstrates the advantages of setting parking fees closer to a level that covers the resource cost of car parking rather than simply covering the operational and maintenance cost of providing parking. In this scenario, the parking resource can yield a return on the capital involved, and this can be used to mitigate negative externalities of private motor vehicle use. It also demonstrates the importance of providing alternatives to private car travel if parking fees increase (such as high-quality buses and safe walking and cycling routes), to ensure businesses and services in the city centre remain accessible.

5.2.3 Wellington

The Wellington City Council urban growth plan (*Wellington Urban Growth Plan: Urban Development and Transport Strategy 2014–2043)* recognises that travel demand is influenced by the provision of car parking. Adjusting parking supply and cost is seen as an important part of a comprehensive approach to travel demand management[28]. The plan also recognises the need to think critically about how space can be reallocated from parking to other modes. Amongst other things, the plan aims to:

- Discourage the provision of commuter car parking in the central city and prioritise short-stay parking.

[25] http://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20E%20Auckland-wide/4.%20Infrastructure/E27%20Transport.pdf
[26] https://www.qldc.govt.nz/assets/Uploads/News/QLDC-Parking-changes.pdf
[27] https://www.odt.co.nz/regions/queenstown/surplus-target-getting-people-out-cars
[28] *Wellington Urban Growth Plan: Urban Development and Transport Strategy 2014–2043,* Real Transport Choices part, section 5 Manage parking more efficiently. https://wellington.govt.nz/~/media/your-council/plans-policies-and-bylaws/plans-and-policies/a-to-z/wgtn-urban-growth/wgtn-urban-growth-plan2015.pdf

- Investigate commuter/long stay parking as a demand management measure to affect modal share.
- Support "park and ride" to support public transport use in suburban locations.
- Use dynamic pricing to manage demand.
- Review District Plan provisions regarding the supply of parking in residential areas.

Council car parks are primarily on-street, comprise around 10% of the public parking in Wellington City and have an average occupancy of 83%[29]. They are priced to manage demand and prioritise short-stay use to support retail activity. There is also an active private car parking market operating in Wellington. The Council had previously offered free car parking on the weekend to compete with suburban malls and support retail activity. This was eliminated in 2018 due to revenue concerns and to meet Council objectives of encouraging the use of public transport and active transport modes in the weekend. Initial reports[30] from the Council (based on retail spending figures) show the introduction of changing for weekend car parking in the Wellington's CBD has not impacted businesses. Furthermore, the Council also reports that charging for parking has freed up more car parks because people are parking for a shorter period.

5.2.4 Zürich

In 1996 Zürich introduced a system of car parking management which effectively caps the total number of car parks (public and private) within the city. The aim of the policy is to support demands for greater pedestrianisation and cycling infrastructure but also consider the interests of businesses. It does this by balancing the creation of additional off-street parking with an equal reduction in on-street parking, with the eliminated on-street parking areas being used for green spaces / public realm enhancement, pedestrianisation, and cycleways[31].

This policy has several benefits in terms of supporting the use of public and active transport; (a) it creates safer and more amenable pedestrian and cycling environments on streets where on-street parking was removed; (b) the cap on parking reduces congestion so that public transport could operate more efficiently; and (c) the increased price and limited availability of parking encourages people to convert to the less costly and potentially more convenient option of public transport or active modes.

[29] http://ltp2018.publications.wellington.govt.nz/Part+D+Statements+of+Service+Provision/7+Waka+Transport#7.2+T%C5%ABnga+waka+Parking
[30] Refer to: https://www.stuff.co.nz/business/108814562/loss-of-free-weekend-parking-hasnt-hurt-wellingtons-cbd-retailers-council-says
[31] Refer to: http://push-pull-parking.eu/docs/file/cs07_push_measures_supplycapzurich.pdf

6 Viability of Councils Providing Public Off-Street Parking

Councils often receive feedback from various groups advocating that they should provide more public off-street parking. It is important to understand the financial implications and trade-offs of providing such parking.

Instead of reviewing management practices from comparable cities, this section of the report outlines some high-level assessment criteria in terms of the commercial viability of providing public off-street parking. This is based from MRCagney's experience in this area. The purpose of this section is to outline the high-level steps that Council should go through when considering whether to provide additional public off-street parking. The steps illustrate the trade-offs that need to be made, especially if the provision of parking is not commercially viable. The trade-offs faced may serve as useful messages to be communicated to the public, stakeholders, staff and elected members.

6.1 Step 1 – Commercial Viability

The way a Council will approach the provision of off-street parking, depends on whether it is commercially viable to do so.

An IPENZ research paper by Nunns (2017)[32] developed a methodology for comparing costs and revenues from parking facilities.

Key inputs for this analysis are:

- Parking supply costs:
  - Updated construction costs for multi-storey parking facilities, which can be sourced from QV Costbuilder;
  - Current land prices in areas of interest;
  - Parking operation and maintenance costs.
- Parking revenues:
  - Hourly or daily parking tariffs in areas of interest;
  - Parking occupancy data.

If off-street parking facilities **are** commercially viable, private providers have an incentive to supply the facilities to meet demand. Councils can then encourage private developers to provide the facilities, instead of the Council providing the facilities.

If the facilities are **not** commercially viable, it is recommended that councils adjust parking prices (in accordance with chapter 3 of this report). Should off-street parking be provided anyway, alternative methods to fund the facilities will be needed (e.g. rates subsidy, targeted rates, development contributions from new buildings).

[32] Nunns, P. (2017) *Are we leaving money on the table? Assessing the impacts of public and active transport investments on car ownership and parking costs*, IPENZ Transportation Group Conference, March 2017

6.2 Step 2 – Options for providing off-street parking

If new public off-street parking is commercially viable. Options available to a Council are:

- **Do nothing:** Maintain existing District Plan rules and leave it to private parking providers to supply additional parking when they perceive benefits from doing so.
- **Adjust consenting and design requirements:** Change District Plan rules to make consenting new non-accessory parking facilities easier. Change design standards for new facilities to reflect urban design goals.
- Help parking providers with site selection

If public off-street parking is not commercially viable, the following options for Councils are:

- **Do nothing:** Maintain current facilities and wait for parking to be commercially viable.
- **Arrange a subsidy for new shared parking facilities:** Entailing Council subsidising private or public provision new public facilities. This option is NOT recommended except under exceptional circumstances.

6.3 Step 3 – Assessing options to deliver off-street parking

Once suitable options from Step 2 have been identified, there are three criteria the Council should assess each option against. These are:

- **Certainty** – The level of certainty the option provides the Council and local residents/businesses about timing and location of car parking provision.
- **Alignment of benefits and costs -** How much do people pay in proportion to the benefits they receive.
- **Subsidy -** The level of subsidy required from non-users.

The following tables assesses at a high-level the options in Section 6.2 against the first two criteria above. We have not assessed the last criterion in Section 6.3, 'The level of a subsidy needed from non-users', because we do not know what the level of subsidy required is (we would need an actual proposal to assess this). Since we do not know the level of subsidy required, we cannot accurately assess the delivery options against this criterion.

Options are scored based on how well they achieve the criteria using either High (H); Medium (M); or Low (L).

- A 'High (H)' score is good as it means the option delivers positively against the criteria.
- A 'Low (L)' score is bad as it means the option does not deliver positively against the criteria.

An explanation for each score given is provided in the tables below.

Table 3: Scoring against the 'Certainty' criterion.
Certainty criterion = the level of certainty the option provides TCC and local residents/businesses about the timing and location of car parking provision.

Off-street parking proposed is commercially viable		
Option	**Scoring**	**Explanation**
Do Nothing	L	HCC would have little influence over parking location and timing, except insofar as the consenting process enables it to have a view
Adjust consenting and design requirements	L/M	Adjusted consenting criteria and design requirements could give HCC some additional influence over parking location
Help parking providers find a site	M	Working with private providers would enable HCC to influence decisions, especially if public off-street parking was provided on identified council-owned land
Off-street parking proposed is not commercially viable		
Option	**Scoring**	**Explanation**
Do Nothing	L	HCC would have little influence over parking location and timing, except insofar as the consenting process enables it to have a view. Although it is unlikely that any new off-street public parking would be developed by private operators where it is not commercially viable.
General rate subsidy	M/H	Providing direct funding for parking would enable HCC to influence parking location and timing. It would still be necessary to consider other commercial factors, e.g. availability of suitable sites, either in private ownership or council ownership, as well as resource consent considerations.
Targeted rate on city centre or town centre businesses	M/H	
Development contributions for new city centre or town centre developments	M/H	
Offering Council-owned land at below market prices	M/H	

Table 4: Scoring against the 'Alignment of benefits and costs' criterion.
Alignment of benefits and costs criteria = for the people who benefit from the project, how much they pay in proportion to the benefits they receive.

Off-street parking proposed is commercially viable		
Option	**Scoring**	**Explanation**
Do Nothing	H	Parking users are the people who benefit most directly from parking provision. A commercial funding model would best align benefits and costs because it is a user pays system and does not include any direct subsidy from ratepayers.
Adjust consenting and design requirements	H	
Help parking providers find a site	H	
Off-street parking proposed is not commercially viable		
Option	**Scoring**	**Explanation**
Do Nothing	N/A	N/A
General rate subsidy	L	A general rates subsidy would require all ratepayers to contribute, even if they did not use or directly benefit from the parking facilities. If public off-street parking facilities in the city centre or other town centres have significant positive impacts on traffic congestion that affects the wider road network, then a rates subsidy may be justifiable (I.e. concentrate most parking into off-street facilities, thereby reducing congestion caused by cruising for parking). However, this may not eventuate as providing subsidised (i.e. low-priced) parking is likely to generally stimulate additional driving and hence congest the wider road network.
Targeted rate on city centre or town centre businesses	M	Provision of subsidised public parking is most likely to benefit town centre or city centre businesses who can access additional customers. Hence a targeted rate on these businesses in the location at which public parking will be provided will be moderately efficient at aligning costs and benefits. The reason why the score is M and not H is because not all businesses necessarily benefit from more parking, but are required to pay this targeted rate anyway by virtue of being located in a particular business improvement district.
Development contributions / financial contributions for new city centre or town centre developments	L/M	As noted above, the benefits of subsidised public parking are likely to accrue to both new and existing city centre or town centre businesses. Hence this option will be less efficient at aligning costs and benefits than a targeted rate. However, it may be the case that increases in parking demand are primarily due to new developments, rather than existing businesses that are increasing turnover. In this case some efficiency may be gained back.
Offering Council-owned land at below market prices	L	This option may not result in any direct financial costs to Council, unless it had alternative plans to sell sites for development. However, it would require HCC to sell an asset at below its market value, which is an 'opportunity cost' that would be spread throughout the district rather than focused in the area that benefits the most. As a result, this is not likely to closely align costs and benefits.

6.4 Step 4 – Selecting preferred option

The above steps can guide the Council in its decision as to whether to increase off-street parking supply, and which delivery option is most suitable.

7 Kerbside Space Allocation

Allocating valuable street space to car parking and other functions is an often-contested component of parking management. While providing on-street car parking can provide many public benefits, these benefits are not equal in all locations. In addition, there can be a range of opportunity costs from using kerbside space for car parking where it could be more effectively used for other functions such as traffic or bus lanes, bus stops, cycling lanes, footpaths or improving the attractiveness of the public realm. This section investigates and recommends policies on how to allocate kerbside space between competing uses such as car parking, traffic lanes, bus lanes, bus stops and footpaths.

7.1 Literature review

The literature review shows that there are benefits to be gained from allocating kerbside space (which may involve reallocation of existing parking) to other uses such as pedestrian and cycling infrastructure including higher footfall and economic returns in retail centres, reduced vehicle kilometres travelled, and the more efficient movement of people in space-efficient modes such as cycling. However, the key caveat of this reallocation is that the law of diminishing marginal returns applies; it is possible to reallocate **a certain amount of** kerbside space for improved amenity or movement outcomes, but the wholesale reallocation of space from one use to another (e.g. removal of all parking in a town centre) was not recommended in the literature. Furthermore, incrementally reallocating kerbside space has the added benefit of being able to trial and test the impacts (especially through temporary trials), with the ability for reinstatement if necessary.

7.1.1 Allocation of kerbside space for active modes

Several international studies have investigated the social, economic and environment impacts arising from road space re-allocation and investment in streetscape works.

- Studies in San Francisco[33] and Seattle[34] have both reported a positive impact on retail sales after the removal of parking to install bike lanes.
- An NZTA study found that public realm investments and the provision of kerb extensions, refuge islands and controlled crossings resulted in a 7% to 90% increase in pedestrian use in seven of eight New Zealand cities[35].
- A University of Otago study found that investment in cycling and walking infrastructure reduced vehicle kilometres travelled, carbon emissions and car ownership[36].

7.1.2 Allocation of kerbside space to improve the public realm

Repurposing car parking spaces can also serve wider economic benefits to activity centres and can result in stronger commercial investment appeal as shown in the examples below. The contexts in which these types of changes are likely to maximise net benefits include:

- Re-allocating kerbside parking space to expanded footpaths, public realm and outdoor dining space in city and neighbourhood centre environments with high levels of pedestrian and hospitality activity.

33 Drennen, E. (2003). Economic Effects of Traffic Calming on Urban Small Businesses. Department of Public Administration San Francisco State University
34 Rowe, K (2013) B I K E N O M I C S Measuring the Economic Impact of Bicycle Facilities on Neighborhood Business Districts
35 Turner, S, R Singh, P Quinn and T Allatt (2011) Benefits of new and improved pedestrian facilities – before and after studies. NZ Transport Agency research report 436. 142pp.
36 University of Otago (2018) (https://phys.org/news/2018-12-lanes-walkways-car-emissions.html)

- Re-allocating kerbside parking space to expanded footpaths at busy intersections with high levels of pedestrian activity with consequent pedestrian safety and amenity benefits.
- Re-allocating kerbside parking space to dedicated movement lanes for cycles or buses on streets that serve a strategic corridor function for these modes.

Priority should be given to re-allocation in the types of city centre and town centre contexts above. An incremental approach to re-allocation of spaces allows for testing of impacts and is likely to be more acceptable to sceptical stakeholders. Examples and results of implementation are shown in the table below.

Table 5: Case studies of re-allocating kerbside space

Location	Policies/Interventions	Results
Melbourne	A study on the possible conversion of on-street and off-street parking to more productive land uses.	Estimated that for each $1 million in economic output generated by the new land use approximately $0.26 million in additional demand for goods and services[37].
Sheffield, UK	To attract people to the CBD the city narrowed roads and removed parking for more pedestrian activity.	35% increase in footfall and a further estimation of a net increase in spending of £4.2 million (based on 7% attribution of additional spend of £12.20 per visitor)[38].
San Francisco	Pavement to Parks programme created temporary parks by converting on-street car parking space to use by the public adjacent cafés and restaurants.	The first trial parklet saw an increase in pedestrian traffic of 37% in the area during weeknights and a 350% increase in people walking with bikes during the weekend. Similar outcomes have been recorded across the city[39].
Auckland	With the "Shared Space" programme pedestrians, cyclists and motor vehicles share an expanded realm, pedestrian movement is prioritised over vehicular movement and on-street parking space was significantly reduced. [40]	A 2011 post-evaluation report for the Fort Street shared space project found that foot traffic increased by 50% during peak hours over 2008 levels while consumer spending had increased by 47%[41].

7.2 Examples of management practices in other cities

The following section outlines kerbside space management strategies in Auckland, Christchurch and Lower Hutt and includes example kerbside space allocation hierarchies for two cities.

[37] Box Hill Central Areas Activity Car Parking Strategy, prepared by GTA Consultants
38 The Pedestrian Pound – The business case for better streets and places (https://www.livingstreets.org.uk/media/3890/pedestrian-pound-2018.pdf)
[39] *Ibid* at 38
[40] Davis, D (2015) A Tale of Two Cities (2): Auckland's Shared Space Programme Turns Streets into Places https://www.vienncouver.com/2015/01/aucklands-city-centre-shared-space-programme/
[41] Case Study: Fort Street: Auckland New Zealand https://globaldesigningcities.org/publication/global-street-design-guide/streets/shared-streets/commercial-shared-streets/case-study-fort-street-auckland-new-zealand/

Table 6: Other city examples of kerbside space management

City	Planning Documents/Strategies	Policies
Auckland	*Auckland Transport Parking Strategy* (2015) recognises both the desirability of providing car parking in some locations as well as the benefits of catering for improved amenity, movement of people and public transport.	**Parking on arterial roads**: places priority on movement of people and goods over parking. This is mode neutral unless the road is identified for mode priority in other plans (e.g. cycling or frequent bus service) Requirement for case by case assessment particularly when arterials pass through town centres. Loss of parking on arterials can be mitigated through side-street or off-street parking and information provision. **Parking on narrow streets:** addresses the challenge of overcrowded parking on narrow streets which can cause access problems including for emergency services, vehicular movements and people walking. Streets is less than 6.5 metres and with known access problems will be assessed and if there is insufficient clearance for an emergency vehicle parking may be removed on one side through a No Stopping restriction on alternating sides of the street to slow vehicles.
Christchurch	The *Draft Suburban Parking Policy* seeks to develop a city-wide strategy to address competing demands for public space in suburban streets and council car parks.	**Prioritisation of suburban road space:** codifies a context specific hierarchy of prioritisation of kerbside space for non-parking use with the prioritisation of parking types in designated parking locations. The extracted hierarchy is shown in Figure 3. Safety is the key priority followed by movement (of pedestrians, cyclists, buses and general traffic), and amenity (landscaping and street furniture). Like Auckland, narrow streets with parking issues will also be reviewed for the possible application of a No Stopping restriction on alternating sides of the street.
Lower Hutt	The Lower Hutt *Parking Policy* adopts a framework to enable consistent decision making about road allocation in different contexts.	The framework aligns road space priorities with road classification and surrounding land use contexts in a three-stage process: 1. Roads are classified using NZTA's One Network Road classification and recommended for no parking or further assessment. 2. The framework identifies three land use contexts with different road allocation priorities for each context as shown in Figure 2 3. A hierarchy of road allocation priorities is outlined for each of the three contexts. The top 5 priority uses of space are the same across all areas and reflect road safety and efficient movement, and Council's aims to **increase use of alternative transport modes**

Figure 3: Kerbside space allocation hierarchy, Christchurch Draft Suburban Parking Policy

	Commercial Areas	Residential Areas	Other Areas (such as Industrial)
1st priority	Safety	Safety	Safety
2nd priority *	Movement and Amenity	Movement and Amenity	Movement and Amenity
3rd priority	Bus Stops/ Cycle Parks/ Bike Corrals/ Shared parking for bike share or car share	Bus Stops/ Cycle Parks/ Bike Corrals/ Shared parking for bike share or car share	Bus Stops/ Cycle Parks/ Bike Corrals/ Shared parking for bike share or car share
4th priority	Taxi Ranks (special passenger vehicle stands)	Residents Parking/ Mobility parking	Mobility parking
5th priority	Loading Zones/ Mobility parking	Short Stay Parking	Short Stay Parking
6th priority	Short Stay Parking	Commuter Parking	Residents Parking
7th priority	Residents Parking		Commuter Parking
8th priority	Commuter Parking		

Figure 4: Parking Hierarchy in Lower Hutt Parking Policy

	Parking Hierarchy		
	No parking		
	Live and Play *(Residential and Parks)*	**Shop and Trade & Work and Learn** *(Retail and Services & Offices and Schools)*	**Make, Grow, and Move** *(Agricultural, industrial, and warehouses)*
	No stopping zones	No stopping zones	No stopping zones
	Existing property access	Existing property access	Existing property access
	Public transport stops	Public transport stops	Public transport stops
	Mobility parking	Mobility parking	Mobility parking
	Active modes – including provision for removing car park spaces for walking and cycling infrastructure	Active modes – including provision for removing car park spaces for walking and cycling infrastructure	Active modes – including provision for removing car park spaces for walking and cycling infrastructure
1	Drop off/ pick up zones (schools/ rail)	Amenity - inc. landscaping and/or adding street furniture	Drop off/ pick up zones (schools/ rail)
2	Residential parking *	Drop off/ pick up zones (schools/ rail)	Loading Zones
3	Short-term parking	Loading Zones	Motorcycle/scooter parking
4	Loading Zones	Short-term parking	Local employee parking
5	Amenity - inc. landscaping and/or adding street furniture	Motorcycle/scooter parking	Short-term parking
6	Motorcycle/scooter parking	Residential parking *	Amenity - inc. landscaping and/or adding street furniture
7	Residential visitor parking	Local employee parking	Residential parking *
8	Local employee parking	Residential visitor parking	Residential visitor parking
9	Commuter car parking	Commuter car parking	Commuter car parking

8 Park and Ride

This section reviews technical and academic literature to provide an evidential base upon which to make decisions on park and ride supply and management as well as examining the park and ride strategies of cities in New Zealand and abroad.

8.1 Literature Review

The purpose of this review is to illuminate common objectives identified in the literature and by other cities as to why investments in Park and Ride should be made. A list of common objectives of Park and Ride policies outlined below are drawn from the *Park and Ride – Best Practice Review*[42] commissioned by the City of Edmonton, Canada and the Transportation Research Board's guidelines on public transport station access which includes a detailed chapter on access via Park and Ride.[43]

Common objectives of Park and Ride:

- Reduce single-occupancy vehicle kilometres travelled (VKT) and overall VKT to mitigate congestion, and air and noise pollution;
- Extend the reach of rapid transit services to a customer base that would otherwise not be viable to serve;
- Provide safe and convenient parking to encourage drivers to transfer to public transport;
- Relocate parking away from the city centre to reduce city centre congestion, thereby freeing up land in the city centre for other land uses;
- Improve mobility and convenience for travellers;
- Encourage desirable land use and development;
- Minimise expenditure;
- Minimise adverse effects on communities including spill over to local streets
- Stabilise parking demand in the city centre by providing viable alternative transportation to support economic development in the city centre.
- Prioritise carpooling and van pooling for public transport passengers which may allow for more boarding's with the same number of parking spaces.

8.1.1 The benefits of Park and Ride

Carefully planned and managed Park and Ride can generate significant benefits for the wider transport system, including:

- Encouraging public transport patronage.
- Extending the reach of key public transport services I.e. in lower density areas the population may not support the provision of feeder bus services to major transport hubs.
- Reducing congestion on major routes and around major centres.
- Making higher density centres more accessible through connection to public transport.
- Reducing parking requirements at major centres and thereby freeing up land in major centres for other uses.

[42] Steer Davies Gleave (2017) *Park and Ride – Best Practice Review*, Steer Davies Gleave, Vancouver, Canada
[43] Transportation Research Board (2012) *Guidelines for Providing Access to Public Transportation Stations*, Transit Cooperative Research Program Report 153

- Providing access to public transport for individuals with mobility issues.
- Improving efficiency of land use by accommodating Park and Ride in existing underutilised car parks such as sports clubs, supermarkets. Sylvia Park shopping centre in Auckland allows online pre-paid Park and Ride in its car park during weekdays for people accessing the nearby train station and bus stops

8.1.2 The dis-benefits of Park and Ride

The key dis-benefits of Park and Ride are:

- Inducing existing public transport users to drive to Park and Ride whereas they previous accessed public transport by walking, biking or connector bus services.
- Undermining existing feeder buses to stations.
- Divert funds from more beneficial transport initiatives.
- Creating inequity effects as investment in Park and Ride favours high socio-economic groups who can afford to drive.
- The financial cost of providing parking, especially if land values are high.
- Affect economic development by reserving large amounts of land for parking and reducing land available for other potentially more productive commercial or residential uses
- Encouraging future low-density car-based residential developments.
- Impacting local traffic, noise and visual effects.
- Inducing localised traffic congestion, reducing the attractiveness and ease of walking and cycling to PT.
- Disrupting local parking markets when utilised to access nearby activities (rather than public transport services).

8.1.3 The costs of Park and Ride

While Park and Ride can generate large benefits, it can also incur significant costs and cities must consider whether subsidising Park and Ride facilities is an effective way of delivering on strategic transport and land use objectives. Much of the cost associated with providing Park and Ride facilities flows directly from land purchase and construction (in situations where the construction of a new parking area is required). Based on MRCagney's experience in Auckland, Wellington and Australia, the capital costs of providing surface and structured car-parks in New Zealand can vary between $10,000 and $40,000 per parking space respectively. For example, a surface park and ride for Swanson Station in Auckland completed in 2016 comprising 136 parking spaces costed around $18,000 per space.

Other costs include maintenance of the facility and the additional driving and localised congestion generated by inducing people who would have otherwise accessed the station by another mode. Park and Ride can also crowd out and/or detract from potential land use development, resulting in an opportunity cost in terms of foregone patronage and/or revenue, as well as reduced civic amenity.

8.2 Park and Ride Strategies in other cities

While the cities reviewed below are larger than Hamilton, they provide useful examples of some of the policy challenges associated with investing in Park and Ride, and the strategies that may be adopted to guide their investment.

Location	Strategy	Outcomes/Comments
Melbourne, Australia	In 2006, the Victorian State Government committed $90 million to deliver 5,000 additional Park and Ride spaces in and around Melbourne. By 2008 approximately 580 additional spaces at seven different rail stations had been delivered.	A 2010 review[44] found that only 36% of Park and Ride users who used the new and expanded facilities had previously driven to their final destination: 64% of new Park and Ride users were existing train users who had simply started to drive to the station instead. It also found that new Park and Ride spaces generally do not generate new public transport trips on a pro rata basis, and that Park and Ride is most effective at generating new trips in outlying locations.
Vancouver, Canada	Translink provides only 8,000 Park and Ride spaces for a network with (approximately 890,000 boardings per weekday)[45]. Their policy is to pursue the "highest and best use of land" and pursue Park and Ride only when "it is cost effective and can provide efficient access to the transit network".[46]	Translink favours access by lower cost modes, such as walking and cycling, and/or pursuing opportunities for Transit Oriented Development. They note that Park and Ride has several disbenefits including: Sterilising land around stations that are ideal for dense development; disconnecting urban areas from the public transport system; promoting low density urban development; discouraging all-day rides and raising safety and personal security issues.
Edmonton, Canada	The Park and Ride strategy[47] for the City of Edmonton outlines the key objectives as: Reducing congestion by shifting car trips to public transport; Targeting trips from regional areas to the dense downtown and university by intercepting car trips around the edge of the main urban area; and Focusing Park and Ride on areas where population densities do not support regular bus services.	This strategy indicates that location for Park and Rides should focus primarily on sites where intensive development is either not possible, or feasible in the short to medium term. Ideal sites are areas zoned for transport or utility purposes where other uses are very limited.
Calgary, Canada	The City's policy sets a 15% patronage target via Park and Ride as a formal strategy[48]. It allows private landowners to make their parking available to commuters and adopts criteria for determining Park and Ride capacity based on the station catchment, nearby road capacity, and the character of nearby land uses. Park and Rides are preferably located beyond a 5.0 km radius from the city centre. At each of the Park and Rides, 50% of spaces are reserved for monthly leases, while the remainder are free. After 10.00 am, unused monthly Park and Ride spaces are available for use by the general public.[49]	The City has achieved its 15% patronage target at suburban stations[50]. However, they also seek to manage the effects of Park and Ride to maintain public transport patronage while limiting negative impacts on traffic in neighbourhoods as well as goals to minimise car use. It identifies locations where Park and Ride could be both expanded and reduced as well as using pricing as a management tool.
Auckland	The *Auckland Transport Parking Strategy*[51] outlines the following Park and Ride objectives: extending the public transport catchment particularly where connector buses are prohibitively expensive; reducing congestion through mode shift; relocating commuter parking to more peripheral locations.	Auckland's Park and Rides are typically full by early morning peak and are not yet subject to pricing. However, the Strategy explicitly references using price to manage demand: encouraging travellers to access the station by alternative means where possible thereby increasing availability for those with limited access options.

[44] *Ibid* at **Error! Bookmark not defined.**
[45] *Ibid* at 42
[46] TransLink (2012) Park and Ride Policy, Translink, Vancouver, Canada
[47] City of Edmonton (2009) *Park and Ride: Transportation Planning Branch Position Paper*, City of Edmonton, Canada
[48] https://www.calgarytransit.com/calgary-transit-park-ride-policy
[49] Calgary Transportation Department (2016) *A review of Calgary Transit Park and Ride*, Calgary City Council, Canada
[50] *Ibid* at 42
[51] https://at.govt.nz/media/1119147/Auckland-Transport-Parking-Strategy-May-2015.pdf

Canberra	The 2015 *ACT Parking Action Plan*[52] contains the following for Park and Ride investment and management in Canberra: Target Park and Ride at customers who cannot access the frequent network by walking, cycling or feeder buses; and Park and Ride must support planned public transport and future land use objectives as land becomes more valuable.	The Action Plan aims to service the city's existing bus network and planned light rail network.

Table 7: Park and Ride Strategies in other cities

[52] https://www.transport.act.gov.au/__data/assets/pdf_file/0008/888191/ACT-Parking-Action-Plan.pdf

9 Preferential parking and cycle parking

9.1 Literature review

Extensive academic and technical literature exists on the topics of car share and cycle parking, including the benefits and drawbacks of their implementation. However, little literature was found on other types of preferential parking, such as mobility parking, taxi stands, and loading zones.

A study by Shaheen and Cohen (2013)[53] reviewed studies analysing the reported benefits of car share across Australia, Europe and North America. They found that:

- The number of private vehicles owned is reported to be reduced by 7 to 10 in Australia, 4 to 10 in Europe and 9 to 13 in North America for every car share vehicle in operation. This also means a corresponding reduction in required parking spaces.
- Vehicle Kilometres Travelled was demonstrated to be reduced by 28% to 45% in a variety of European studies. In North America, some studies demonstrated a reduction of up to 80%.
- European studies indicated that between 15.6% and 34% of participants sold a vehicle after joining a car sharing programme. In North America, the range was 11% to 29%. North American studies also factored in the decision to forego car purchase altogether, which increased the number to 50%.

Auckland's car share operator, Cityhop, reports each of its cars replacing 9 to 13 cars off the road, which is 17,500m of kerbside parking space saved.

A study of North American car share use found little effect on public transport use and walking rates in some cases, but in other cases a statistically significant move away from public transport by users of car share, suggesting that car share users may use the schemes in place of other modes, like walking or public transport[54]. Despite this, overall vehicle kilometres travelled (VKT) trends and vehicle ownership were lower. Other North American studies have found increased rates walking and cycling among. It is not known whether car share users are already more likely to use active modes to travel or whether joining a car share scheme influences travel toward active modes[55][56][57][58]. A further reported benefit of car share schemes is the broadening of travel choices, potentially offering an equitable transport option[59]. By extension, parking space for such schemes can contribute to increasing affordable and equitable transport a city's residents.

Several best practice principles guide the provision and location of car share parking.

- Council-run parking spaces (both on and off-street) should be made available to car share companies. This increases the availability of spaces to as many potential customers as possible.
- To encourage car share companies, Councils may consider not charging them for the use of the parking spaces. They should retain the discretion to charge in the future.

[53] Shaheen, S.A. & Cohen, A.P. (2013): Carsharing and Personal Vehicle Services: Worldwide Market Developments and Emerging Trends, International Journal of Sustainable Transportation, 7:1, 5-34
[54] Martin E, Shaheen S (2011). The Impact of Carsharing on Public Transit and Non-Motorized Travel: An Exploration of North American Carsharing Survey Data. Energies. 4(11):2094-2114.
[55] Kent, J.L. (2014) Car sharing as active transport: What are the potential health benefits? *Journal of Transport & Health* 1 (2014) 54-62
[56] Lane, C. (2005) PhillyCarShare: First-Year Social and Mobility Impacts of Carsharing in Philadelphia, Pennsylvania. *Transportation Research Record: Journal of the Transportation Research Board, No. 1927*, Transportation Research Board of the National Academies, Washington, D.C., 2005, pp. 158–166
[57] Shaheen, S. A., Cohen, A. P., & Chung, M. S. (2009). North American Carsharing: 10-Year Retrospective. Transportation Research Record, 2110(1), 35–44.
[58] Sioui, L., Morency, C. & Trépanier, M. (2013) How Carsharing Affects the Travel Behavior of Households: A Case Study of Montréal, Canada, International Journal of Sustainable Transportation, 7:1, 52-69
[59] Kent, J. L., & Dowling, R. (2013). Puncturing automobility? Carsharing practices. *Journal of Transport Geography*, 32, 86-92.

- Car share should be required to be available 24/7 to customers. This increases the usefulness of the service to different types of customers, which will facilitate the gradual reduction in the need to own a car for both personal and corporate customers.
- A Parking Strategy should expect both one way, and back to base car share set ups.
- Councils should require regular reporting from car share operators, including number of users, types of users, car utilisation and rates of car ownership reduction.

9.1.1 Cycle Parking

A number of studies have shown that dedicated parking can encourage an increase in cycling as a mode of transport.

In a Christchurch study, three groups of people were interviewed about barriers to cycling. They were: University of Canterbury staff and students, recreational cyclists and broader community members. The interviewees were generally more likely to cycle than the average population. Between 5% and 11% of the group said better located bike stands would encourage them to bike more, while 7% to 18% said more secure bike parking would encourage them to bike[60].

Two further studies, one undertaken in Auckland[61], and another in Washington DC[62] noted similar connections between cycle parking and enthusiasm for commuting by bike. In the Auckland study, 28% of respondents said a lack of secure bike parking was barrier, although feelings of safety and lack of separated cycleways were more influential. In Washington DC, those with secure bike parking at work were more likely to commute by cycle.

Cycle parking can be provided in two ways:

- Regulations requiring private developments to provide a minimum number of staff and visitor bike parking spaces, and end of trip facilities (such as lockers and showers).
- Council-installed bike parking on public land.

Best practice principles guide the provision and location of cycle parking[63]: Principles include:

- The number of spaces and type of end-of-trip facilities should be based on occupancy and land use.
- Focus provision of public cycle parking near existing and planned cycleways.
- Locating privately-funded cycle parking in nearby public locations should be considered under requirements for cycle parking in proposed developments.
- Facilities should be provided where there is existing demand, potential to attract use, and should meet demand and allow for increased future demand.
- A mix of long and short stay cycle parking should be provided.
- Focus on hubs where many journeys will converge (e.g. town, entertainment or employment centres).

[60] Kingham, S., Taylor, K. and Koorey, G. (2011) *Assessment of the type of cycling infrastructure required to attract new cyclists*. Wellington: NZTA.
[61] Ipsos (2014) *Active Modes Research*. Auckland: Auckland Transport.
[62] Buehler, R. (2012) Determinants of bicycle commuting in the Washington, DC region: The role of bicycle parking, cyclist showers, and free car parking at work. *Transportation Research Part D: Transport and Environment*, 17(7), 525-531.
[63] Adam, L. (2017) *Standards for Cycle Parking and End of Trip Facilities - Queenstown Lakes District Council Transport Chapter Advice*. Auckland: MRCagney

- Unnecessary costs to developers through requirements to provide cycling facilities when they will be severely underused should be avoided. However, exceptions should be considered carefully.
- Means of providing end of trip facilities economically should be accommodated while maintaining minimum quality standards.

9.1.2 Emerging cycle technologies

Sales of e-bikes have increased rapidly in New Zealand[64], and their rising prominence could have important effects on requirements for parking and end of trip facilities. Changes could include increase cycling by diverse groups, increased cycle-based tourism, changes in end of trip facility needs, changes in cycle parking needs, including charging and space. Dock-less bike sharing is another emerging trend that may require consideration when implementing parking strategies.

9.2 Examples of management practices in other cities

The table below outlines the preferential parking policies several other cities in New Zealand have adopted to address this issue.

Table 8: Preferential parking policies in other cities

Location	Summary of Strategy
Auckland	Preferential parking and cycle parking are guided by two objections in the *Auckland Parking Strategy* (2015). 1. Prioritise the safe and efficient movement of people, services and goods on the road network. 2. Provide an outstanding customer experience at Auckland Transport operated on and off-street facilities. The Strategy contains policies for each type of preferential parking and details about situations where particular parking should be provided. As an example, *Auckland Parking Strategy* Policy 1A outlines requirements for on-street car share parking including: local membership availability requirements, what on-street parking spaces AT will provide and the reporting requirements of car share companies back to AT. The same policy provides similar levels of detail for loading zones, mobility parking, motorcycle parking, taxi stands, bus and tour coach parking (including layover), carpool parking, time restrictions, and cycle parking. The policy also includes details as to the appropriate location and requirements of particular restriction zones (e.g. mobility parking or loading zones. The policy does not provide significant guidance on how competing restriction types should be prioritised. Cycle parking is recognised as more efficient use of the parking resource in the *Auckland Parking Strategy* and replacement of car parking with multiple cycle parking rack has been carried out in various places. Cycle parking is to be prioritised in town centres and to support public transport uptake.

[64] Stuff (2017) *Sales of e-bikes to pass 20,000 a year.* Available at: www.stuff.co.nz/business/money/89409372/sales-of-ebikes-pass-20000-a-year. Accessed 30 October 2018.

Location	Summary of Strategy
Wellington	There are four separate policies relating to preferential parking and cycle parking in Wellington City. **The *Wellington City Council Parking Policy* (2007)** Outlines policy for the supply of taxi stands, mobility parking, loading zones in the Central Areas, Suburban Centres, and Residential areas of the city. **The *Mobility Parking Policy* (2005)** Contains policy around the design and signage, location, future planning, payment, and enforcement of mobility parking spaces. **The *Car Share Policy* (2016)** Sets guidelines and criteria that car share companies must met to qualify for Council-provided on-street car share spaces. The initial two-year permit for these spaces is free. Criteria include allowing online bookings and being available at least 22.5 hours per day, 7 days a week. **The *Wellington City Council Cycling Policy* (2008)** Outlines policies relating to cycle parking, including location and recommended actions. Public transport stations and suburban destinations considered ideal locations for cycle parking investment.
Christchurch	Christchurch also has several strategic documents relating to preferential and cycle parking. **The *Christchurch Central Parking Plan* (2015)** Documents current city centre parking availability and provides future direction on parking supply, including cycle parking, loading zones, and taxi stands. Christchurch aims to supply 2,400 long-stay cycle spaces and 1,700 short-stay cycle spaces by 2041. Dedicated service lanes are preferred over on-street loading spaces. Taxi stands and mobility parking will be provided in conjunction with key precincts and Anchor projects in the city centre. On -street spaces will be prioritised for these two types of parking. **The draft *Suburban Car Parking Policy* (under development)** This draft policy sets a priority order for different types of suburban areas, such as commercial centres or residential streets. Generally, cycle parking, taxi stands, loading zones and mobility parking are given higher priority than general kerbside car parking. ***Car Share Policy* (2016)** Clarifies matters relating to car share organisations using council-controlled land and roads. The policy aims to create an attractive environment for such organisations, and establishes requirements for such companies (e.g. being available 24/7). ***Electric Vehicle Policy* (2016)** Provides guidance on electric vehicle uptake and direction on installation of charging infrastructure and restricting parking spaces for EVs.
Dunedin	Dunedin's *Parking Strategy* has been in place since 2009 and contains approaches to supplying an managing some types of preferential parking, including motorcycle, mobility, carpool and cycle parking. Strategies mainly including working with user groups and assessing demand. It is not clear what actions have been undertaken under the strategy.
Lower Hutt	Lower Hutt's *Parking Policy* (2017) has a hierarchical approach to on-street parking prioritisation. The hierarchy depends on the nature of the underlying area. Land use contexts with different road allocations are: 'Live and Play', 'Shop, Trade, Work and Learn', and 'Make Grow and Move'. The hierarchy used depends on the land use of the area, however the top five hierarchies are the same across all three. These are: no stopping zones, existing property access, public transport stops, mobility parking, and active modes.

10 Parking Enforcement Monitoring and Technology

Parking enforcement in New Zealand is carried out according to a set of national standards, meaning parking rules and fines are usually standardised (for example the maximum fines chargeable for offences). The equipment used to monitor parking, however, can vary from place to place.

Parking enforcement and monitoring can ensure parking is being used as intended, and help Councils understand how people are using parking (e.g. occupancy, peak times).

A range of parking technologies are now available to assist with parking enforcement and monitoring, reducing the need for parking wardens to manually do this work.

One such technology is Automatic License Plate Recognition (ALPR). This involves placing ALPR onto cars, that then drive the streets taking photographs of the number plates of parked cars and note the GPS location of each car. The ALPR-fitted car can then return to an area and scan the street, identifying cars parking in breach of time limits or other rules. Infringement notices or educational reminders can then be issued to owners. The same technology can equally be used to gather data on parking usage and to monitor trends in parking occupancy, turnover, duration of stay and levels of infringement.

The technology presents a significant saving in operational costs. North Sydney Council has reported a time reduction in a parking survey, from 41 days to count 13,000 cars, to 14 days to count 180,000 cars. The cost of counting each car in Sydney was reduced from AUD$1.65 per car to AUD $0.08 by use of the technology.[65]

The Australian capital of Canberra has also made use of the technology, enabling the city to inspect 30 kilometres of roadside parking every hour, instead of two by a parking warden.[66]

Auckland Transport is now making use of ALPR technology, trailing residential parking zones in the city fringe, enforcing two-hour visitor parking. The trail is now to be rolled out in other residential parking zones in Auckland. It is expected that parking wardens will still be used in the city centre. Parking wardens will still be required for enforcement "hot spots".[67]

Benefits of using ALPR include cost and time savings, freeing up wardens to focus on other areas, such as hotspots, allowing wardens to move into an education role, instead of focussing on issuing infringement. This last point requires increased automation of infringement issuing.

10.1 App-based parking management vs parking sensors

Councils throughout New Zealand have increasingly used app-based and/or physical sensor-based technologies to manage the demand for public parking, and the associated enforcement of this parking.

Hamilton, like other Councils in New Zealand, is already making use of app-based and physical sensor-based parking technology.

[65] North Sydney Council (2018) License Plate Recognition Fact Sheet. Available at https://www.northsydney.nsw.gov.au/files/assets/public/docs/7_transport_amp_parking/parking/lpr_fact_sheet.pdf Accessed on 26 November 2018
[66] The Canberra Times (2017) Mobile parking ticket cameras recognising number plates to become permanent fixture in Canberra. Available at: https://www.canberratimes.com.au/national/act/mobile-parking-ticket-cameras-recognising-number-plates-to-become-permanent-fixture-in-canberra-20171129-gzuxy3.html Accessed on 26 November 2018.
[67] Sunday Star Times (2018) Parking Wardens: Faster, cheaper and electronic. Available at: https://www.stuff.co.nz/sunday-star-times/105038222/parking-wardens-faster-cheaper-and-electronic Accessed on 26 November 2018

The table below outlines the technologies and where they are used.

Table 9: Summary of app and sensor based parking technology

Technology	Pros	Cons	Cities where this is used for Council-managed parking
Parking Sensors + Apps	Provides real-time data on occupancy, duration, and turnover of every space, street, or zone fitted with a sensor, for both paid parking areas and time-limited areas Real-time data can be used on public signage to show parking availability on streets, for both paid and time-limited areas Suppliers can usually issue such data in customised user-friendly reports	Capital costs and maintenance costs associated with installing sensors into each parking space in the street. The supplier of the sensors and payment system may be different, leading to multiple management systems (e.g. Hamilton uses sensors in the CBD, but traditional manual meters and apps for payment). Issues with data accuracy e.g. Wellington's issues with false data from sensors resulting in a number of incorrect infringements being waived. www.stuff.co.nz/national/102333924/new-research-questions-parking-sensor-technology-used-in-wellington	Hamilton; Wellington; Palmerston North; Auckland (in some time-limited areas only)
Parking apps only	Smaller capital and maintenance costs required compared to sensors Easier roll-out than sensors, as smaller duration and amount of physical works compared to installing sensors Provides data on paid occupancy, duration, and turnover of every space, street, or zone, for paid parking areas only. Suppliers can usually issue such data in customised user-friendly reports	Can only produce data for paid parking areas, as the apps would not be functional for time-limited parking that do not require payment Even in paid parking areas, data does not pick up unpaid parking events (e.g. vehicles that overstay or do not pay at all) or vehicles that leave before their paid parking period is completed. This means that average occupancy and length of stay data produced from the app will not be entirely accurate. Need to demarcate specific segments of each street for payment within the app, with associated signage costs, in order to produce sufficiently geographically detailed data on parking demand (see comment below[68])	Auckland; Tauranga

[68] In Auckland, the use of the app-only management system, AT Park, in the CBD paid area means that every single street/street segment needs to be assigned a unique ID, and this unique ID is displayed on signs along the street as well as affixed on parking meters. In the absence of these unique IDs, the resultant parking demand data for very long streets would not be sufficiently detailed to produce reliable or meaningful results.

11 Impact of Autonomous Vehicles on Parking

MRCagney, with partial funding from Callaghan innovation, in 2017 produced a comprehensive paper on driverless vehicles (*Autonomous Vehicles Research Resort)*[69]. This report describes the progress, barriers to and impact of autonomous vehicles in New Zealand, including parking effects. The findings of this report are summarised below.

11.1 Parking effects

Should autonomous vehicles become commonplace, they are expected to significantly change the makeup of parking demands. Such vehicles would likely be used for many trips each day, with less time spent in off-street facilities, and more in on-street parking waiting to pick up passengers. Some off-street parking will still be required for private vehicles and excess driverless vehicles in off-peak times. Automated or stacked parking infrastructure may be suitable for this purpose.

The MRCagney report makes the following recommendations regarding autonomous parking infrastructure:

- Minimum parking requirements should be removed, as mandated off-street parking will become increasingly unnecessary;
- Adopt demand-responsive parking management, e.g. variable parking pricing and road pricing, to manage circulation and parking demands of autonomous vehicles;
- Put technology in place that lets drivers' book and pay for parking in advance;
- New parking buildings should be compliant with building and housing regulations in anticipation of being adapted for other uses as parking demand decreases.

11.2 Public Transport

Understanding that public transport will not be redundant in a future alongside AVs is important for any city seeking to improve public transport uptake. The following points are relevant:

- Electric, autonomous mass transit vehicles could increase public transport service levels to increase without an increase in subsidies. In Auckland, this increase has been estimated at approximately 80%[70].
- AVs should be used to supplement, not replace, public transport and extend personal on-demand choices.
- Modelling completed in Auckland shows that without public transport, the city will face heavy congestion due to constricted corridors into the city, limited road capacity and a growing population. This applies even with full adoption of AVs and is expected to be true in other cities.
- By providing increased access to cars, cheaper taxi services and potentially encouraging circling of vehicles, AVs have the potential to increase, rather than decrease congestion in cities.

Space efficient vehicles (public transport) is, therefore, likely to be highly important in a future where AVs are used.

[69] MRCagney (2017) *Autonomous Vehicles Research Report* Auckland: MRCagney http://mrcagney.com/case-studies/research/autonomous-vehicles-research-report/
[70] This is based on 2016 levels of fare revenue and costs

Access Hamilton Strategy - Parking

Elected Member Briefing

9 September 2020

Hamilton City Council
Te kaunihera o Kirikiriroa

Purpose

- To seek feedback from Elected Members on the following parking topics:
  - Proposed parking infringement innovation
  - Parking meter technology
  - On-street commuter parking options
  - Guidance on the development of parking principles for the city

Hamilton City Council
Te kaunihera o Kirikiriroa

VISION
Hamilton's transport network enables everyone to connect to people and places in safe, accessible and smart ways.

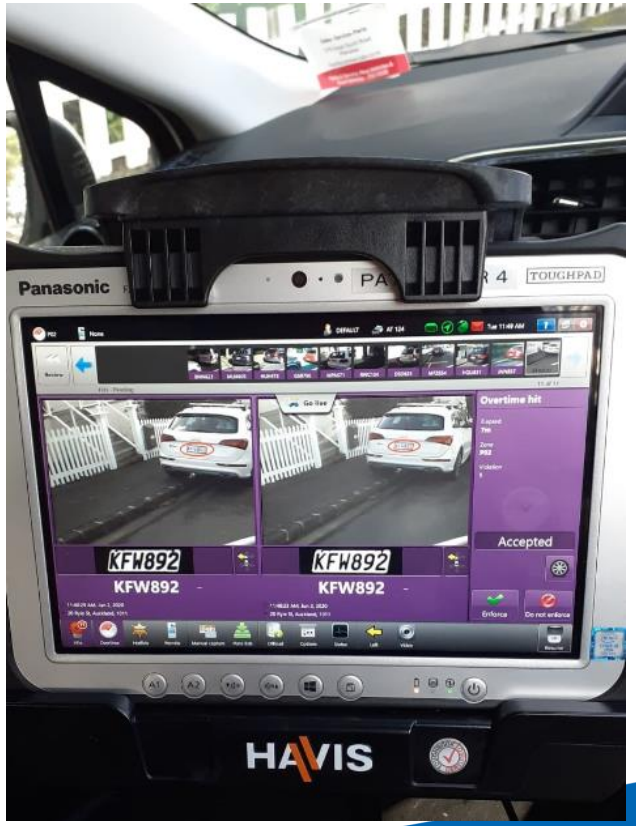
PURPOSE STATEMENT
To improve the health and wellbeing of Hamiltonians by ensuring the transport network supports good travel choices that are safe, easy and connected.

OUTCOME AREAS

- We have a vision for transport in Hamilton and have identified four key outcome areas.
- The strategy needs to set principles and priorities for how we achieve these
- Parking principles are one element of that

Hamilton City Council
Te kaunihera o Kirikiriroa

Parking Infringement Innovation



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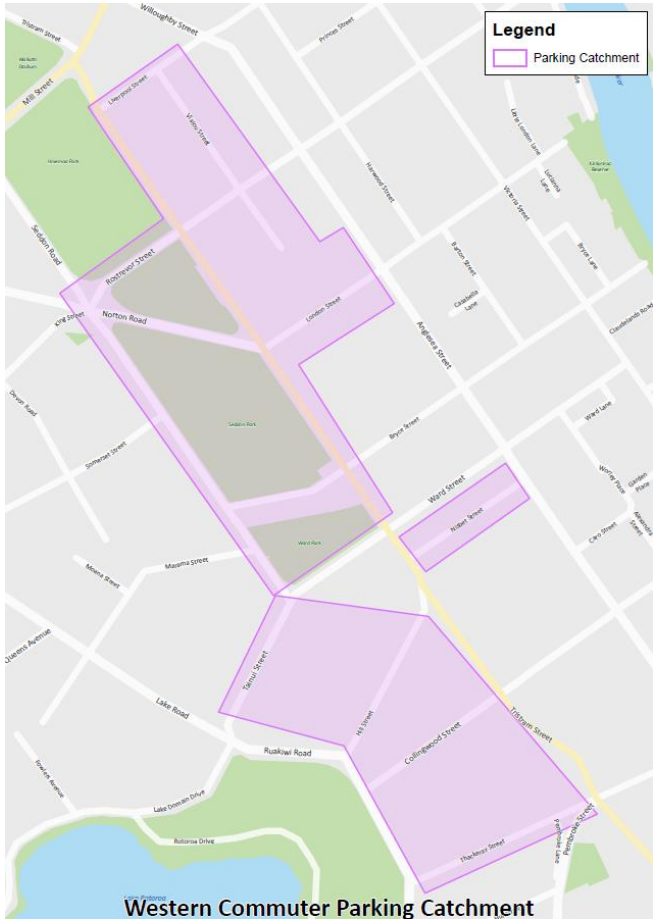
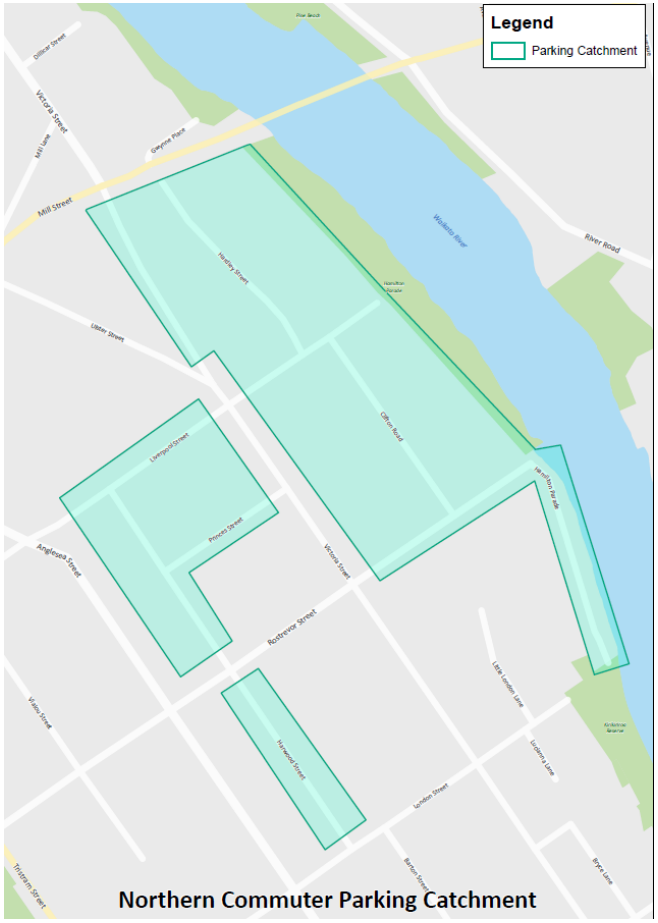
Parking Meter Technology

On-Street Commuter Parking Options – Catchment Areas





On-Street Commuter Parking Options

Questions for Elected Members

- Parking Catchment Areas – do we have these right?
- Demand responsive pricing i.e. starting at $5 p/day, incrementally increasing based on demand
- What type of technology to support commuter parking?

Hamilton City Council
Te kaunihera o Kirikiriroa

Parking

Those who need to park should have a good parking experience, while ensuring Hamilton's economic development and supporting a vibrant City Centre.

The below are approaches to achieving this:

1. Manage Public Resources Efficiently

2. Compact, Vibrant, Accessible Centres

3. Public Transport and Active Modes

4. Attractive Streets

5. Zero Deaths and Injuries

Guidance on the Development of Parking Principles

Questions for Elected Members

- What should the parking principles drive?
- Should staff continue with the work – Parking Management Plan; OR
- Should the parking principles be formulated from the beginning?

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FURTHER INFORMATION

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