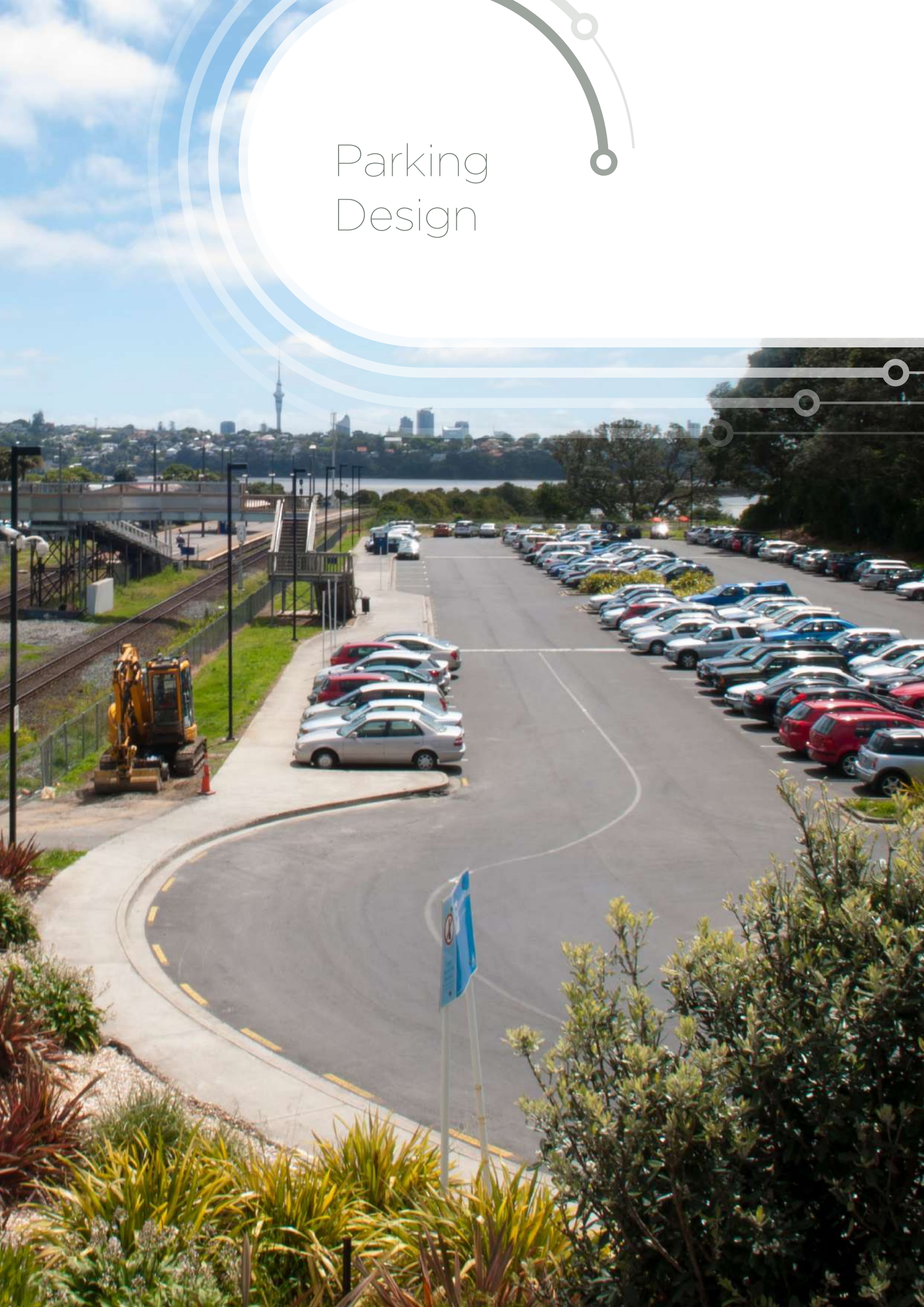
Parking Design



In this chapter

01 Introduction

LAND USE

The demand for parking is driven by land use. Parking can be provided either in association with specific land use, or as a publically shared facility.

PARKING DEMAND

Demand can also be managed by discouraging car use through a combination of parking pricing along with the provision and pricing of alternative modes of transport.

AUCKLAND UNITARY PLAN

Auckland Council's Auckland Unitary Plan sets parking requirements in relation to land use, e.g. the number of parking spaces to be provided for particular land uses or areas. The plan also includes a design table of parking space and manoeuvring dimensions.

AUCKLAND TRANSPORT'S ROLE

Auckland Transport provides public on-street parking within the road reserve and is also responsible for the design, construction and management of some public off-street parking facilities. These include park-and-rides at train and bus stations, and parking areas or parking buildings in town and city centres.

Private off-street parking facilities will generally be subject to the rules in the Auckland Unitary Plan. While Auckland Transport does not set the standards for these car parks, we want to ensure that they function effectively, with minimal impact on the road network.

PARKING STRATEGY

Auckland Transport has developed a parking strategy for Auckland. The strategy defines where AT will allow parking and any parking controls suitable for use. All projects or new development that includes parking in the works area shall update all on street car parking to reflect the strategy.

PARKING SUPPLY

Parking should only be provided to meet the expected number of users. Mobility parking should be considered separately to this number to ensure that mobility needs are met.

URBAN STREETS & ROADS DESIGN GUIDE

This sets out the principles for design of the various street types. Chapter 3 Street Users provides design principles for People in Private Vehicles. Chapter 4 Design Controls gives requirements for standard design vehicles and the space they need.

1.1 Design philosophy

EFFICIENCY OF LAND USE VS EASE OF USE

The design of car parking has to balance efficiency of land use with the efficiency of the parking in terms of access and ease of use. For instance, adopting smaller dimensions for parking bays allows more parking to be fitted into a given area. However, this detracts from ease of use, as tighter spaces make entry and exit more difficult.

DESIGN APPROACH

A table of basic parking dimensions suitable for on-street parking and small to medium at-grade open-air off-street parking is provided below. The dimensions in this table are suitable for medium to high turn-over parking by casual users, e.g. retail sites, commercial sites and community facilities.

AUCKLAND TRANSPORT DESIGN CAR

The Auckland Transport 85th percentile car shall be used for all tracking. The design car shall manoeuvre within the aisle and not enter the buffer zone. The 95th percentile car shall be used as the check vehicle and should use all space available including the buffer.

Both design and check vehicles should be tracked at a maximum speed of 5km/h.

The design car can be found in the Urban and Rural Roadway Design Chapter under design controls.

TABLE 1 PARKING SPACE AND MANOEUVRING DIMENSIONS IN METRES

Parking Angle	Width of bay	Parking Space Depth[1]	Wheel Stop distance from kerb[2]	Traffic / Aisle Buffer[3]	Manoeuvring Space
90°	2.5	5	0.5	1	5.2
	2.6		0.5	1	4.6
	2.7		0.5	1	4.3
75°	2.5	5.2	0.5	1	4.1
	2.6		0.5	1	3.6
	2.7		0.5	1	3.2
60°	2.5	5.2	0.5	0.8	3.3
	2.6		0.5	0.8	3.1
	2.7		0.5	0.8	2.8
45°	2.5	5	0.5	0.5	2.5
	2.6		0.5	0.5	2.5
	2.7		0.5	0.5	2.5
30°	2.5	4	0.5	0.5	2.5
	2.6		0.5	0.5	2.5
	2.7		0.5	0.5	2.5
0[04]	6	2.1			3.7

1. Parking Depth is measured perpendicular to the face of kerb or wall.
2. Wheel stops should only be provided where there is insufficient space within the footpath to accommodate the vehicle overhang and maintain the clear pedestrian through route. Wheel stop placement is included in the parking depth space
3. Traffic / aisle is for separation from moving traffic and could be wider if used as a walking route in a car park.

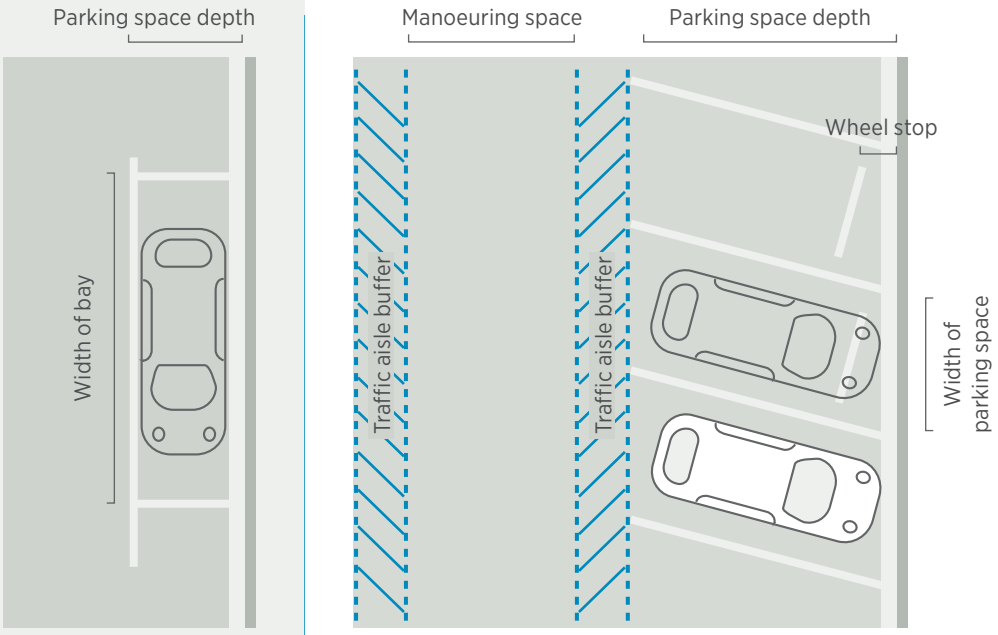


Figure 1
Car parking layout

1.2 On-street parking design

On-street parking is generally allowed subject to:

- The provisions of the New Zealand Transport Agency (NZTA) Road User Rule. These are generally not marked on the road.
- Specific restrictions that Auckland Transport determines. These are generally marked on the road.

ROAD USER RULE PARKING RESTRICTIONS

The Road User Rules include the stipulation that there is no parking:

- On a road without due care or without reasonable consideration for other road users.
- On a road so close to a corner, bend, rise, dip, traffic island or intersection that it obstructs or is likely to obstruct other traffic, or the view of approaching drivers.
- On or within 6 m before a pedestrian crossing.
- Within 15 m of an intersection or within 1 m of a driveway.
- On footpaths, cycle paths or special vehicle lanes (e.g. T2/T3 or bus lanes).

AUCKLAND TRANSPORT PARKING RESTRICTIONS

Signed or marked parking restrictions put in place by Auckland Transport can include:

- Restrictions on the times of day when parking is allowed.
- Restrictions on the class/classes of vehicles that can park in a particular location.
- Restrictions on the users of parking in a particular location, e.g. mobility parking, residents only parking.
- Restrictions on the maximum duration a vehicle can be parked in a location.
- Payment requirements for use of the on-road parking in a location, e.g. pay-and-display or parking meters.
- Prohibiting parking in a specific location.

Restrictions require resolution by the AT Traffic Control Committee.

DEMAND MANAGEMENT

In areas where there is likely to be a significant level of demand for on-street parking or where the demand for on-street parking is likely to conflict with the operation or use of the road, specific design of on-street parking will be required to manage the demand. The target for managed parking intervention is when parking regularly exceeds 85% occupancy. The design can use the physical layout of the parking and the regulatory controls, signs and markings to help achieve the desired effect.

FIT FOR THE ROAD FUNCTION

The design of on-street parking has to suit the function of the road, e.g. reverse out angled parking is unsuitable on roads carrying high volumes of traffic, where high speeds are the norm or cycle facilities are between the angled parking bays and the carriageway.

HIGH PLACE FUNCTION

In a road with high place function, parking can make a positive contribution by providing a buffer between moving vehicles and pedestrians, and by narrowing the available carriageway to reduce traffic speeds. Parking can also be located as a buffer between traffic lanes and a cycle path. However, the benefits of such parking should be considered in the context of the overall streetscape design, including pedestrian access, street planting, furniture and visual character. Space for opening of car doors, for vehicle overhang of kerb, for poles and other street furniture, is required in the Street Furniture Zone. See the Footpath, pedestrian facilities and public realm chapter of this code.

HIGH MOVEMENT FUNCTION

In a road with high movement function, parking has to be designed to minimise its impact on the operation of the traffic lanes. This can be done either through limiting the provision of parking, or by providing for entry and exit manoeuvres that do not impede the through traffic.

OTHER ROAD USERS

The design of on-street parking has to give particular consideration to the safety of other road users. While kerb-side parking can benefit pedestrians by separating the footpath from moving traffic, it can reduce the safety for pedestrians crossing a road. Parking layouts should include gaps in the parking, preferably with kerb build-outs to the edge of the live lanes at points of pedestrian demand. This will help pedestrians to be seen by approaching drivers when they cross the road. Build-outs should also be considered at intersections for sight lines as well as for crossing opportunities.

ANGLE VS PARALLEL PARKING

On-street parking is most commonly parallel to the kerb, but angle parking can be used where space allows. Angle parking generally accommodates more spaces along a length of road. However, it requires considerably more road width than parallel parking, both for the parking spaces and the manoeuvring space behind vehicles. Angle parking has constrained visibility when reversing out of the spaces, so it may not be practical where operating speeds and/or traffic volumes are high. It can be difficult to make safe where people on bikes are passing, or where people are likely to cross the road, such as near schools, therefore if located in an area of high amenity or along side bike routes then consider reverse in angled parking.

SEPARATION BETWEEN PARKED AND TRAVELLING VEHICLES INCLUDING BIKES

Consider the amount of separation between parked vehicles and through-traffic, allowing for the opening of doors (parallel parking) and for reversing out of angle-parking spaces. Particular care with these issues is required for cycle lanes or on other routes where cycling is likely to occur. Manoeuvring space for parking in Table 1 must not encroach on a marked road centre line on arterial roads, and may not encroach on the minimum lane width for opposing through traffic on an unmarked road except for local roads with low speeds (30kph maximum design speed) and traffic volumes (<1500vpd).

PARKING SHOULDER

Many existing arterial and collector roads have wide roadways that function as a single traffic lane and a parking shoulder lane in each direction. Consider marking the shoulder line, and where helpful individual parking bays, to aid lane discipline, speed management and to provide safe space for people on bikes in the absence of parked vehicles.

OTHER GUIDES

See:

- Engineering Design Code - Footpaths & Public Realm for issues regarding pedestrians and street furniture.
- Engineering Design Code - Cycling Infrastructure for issues regarding the provision of cycle lanes adjacent to parking spaces.

1.3 Off-street parking design

PEDESTRIAN PROVISION

A good pedestrian user experience is critical to ensure that car parks can not only function as intended but to also then allow pedestrians to access areas outside of the car park.

The following points need to be considered as part of any deisgn:

- Clearly defined and safe pedestrian routes that run the length of the parking area;
- Coloured surfacing showing safe areas;
- Provision for safe pedestrian movement between the car park and the land use it serves;
- High quality lighting (50 lux minimum); and
- Wayfinding should be provided if needed to direct to multiple destinations.

SMALL AT-GRADE CAR PARKS

For small, at-grade car parks, the appropriate parking and manoeuvring dimensions from Table 1 must be adopted for the parking layout.

The following issues should also be considered.

- Provision of entry and exit to the car park via one or more vehicle crossings.
- Provision for circulation of vehicles within the car park and for on-site turning to avoid reversing manoeuvres back onto the road.
- Appropriate landscaping of the car park area.
- Appropriate regulatory controls for the parking area to discourage parking in circulating areas and to define any time restrictions and/or charging for use of the marked car parks.
- Allocation of mobility parking spaces to provide optimal access to the land use it serves.

LARGER, MORE COMPLEX CAR PARKS

For larger at-grade car parks and for more complex parking structures such as basements, undercrofts and multi-deck parking buildings, additional consideration needs to be given to the entry lanes from the public road. Sufficient uninterrupted entry distance must be provided to accommodate arriving cars without creating queues back onto the public roadway. This is particularly an issue where the management of the parking involves the issuing of tickets at the point of entry. The use of parking aisles for circulation can lead to safety and congestion issues during high activity periods and separate circulation roadways should be considered.

LONG-STAY AND FREQUENT USERS

For large parking areas where a significant portion of the use is likely to be long-stay and/or frequent users (e.g. workers' parking areas, long-stay parking or park-and-ride facilities) consider tighter parking dimensions and maneuvering space.

CONSENT

Adopting tighter dimensions than those in the simplified design table potentially creates an additional infringement of the rules in the Auckland Unitary Plan. This would have to be covered as part of the resource consent/designation process for the project. However, in the case of larger parking facilities with significant volumes of long-stay parking, the efficiency gains (e.g. the increased number of parking spaces or reduced footprint and cost of the car park) are likely to outweigh the costs of justifying the infringement.

SAFETY

Off-street car parking also needs to consider the safety of users. Pedestrian routes from the parking to adjacent land uses have to minimize conflict with vehicles. Personal safety of car park users has to be addressed by designing for safety principles of crime prevention through environmental design (CPTED).

FURTHER GUIDANCE

Additional guidance is provided in AS/NZS 2890.1:2004.

1.4 Park & Ride facilities

Park & Ride facilities are located adjacent to Public Transport stations and are used to provide parking during the day for commuters and other travellers using the PT network.

DESIGN

Park & Ride design is similar to a standard car park but have the following additional considerations:

- Integrated with the PT interchange, station or stop although in special circumstances the P&R may be up to 300m away. If not located nearby then the pedestrian connection between the P&R and the station must be appropriately designed for high volume pedestrian movement and clearly indicated and lit.
- Where charge and time limits apply then Intelligent Transport Services, such as CCTV, can also be used to enable billing and enforcement. CCTV can also assists with the safety and security of people and property
- A 'Kiss and Ride' may be provided near the main station platforms or bus stopping area
- Mobility bays must be located closest to the stop or station entrance to ensure that their travelled distance is short.
- Ride sharing bays should be located second closest to the station entrance or stop location.
- The Auckland Transport Planning and Investment team can advise on mobility/ride share ratio and EV bay provision.

1.5 Mobility parking

NUMBER OF SPACES

Mobility parking spaces and suitable access routes must be provided between the mobility parking and the land use it serves.

FLAT SURFACE

Mobility parking should have level surfaces for ease of entering and exiting the vehicle. Only a minimal slope to provide for drainage is allowable.

ACCESS TO FOOTPATHS

Pram ramps will be required for all mobility bays in order for access to be provided to the footpath. The ramps shall not be blocked by the vehicle parked in the bay and should be accessible with little manoeuvring.

PROXIMITY TO ENTRANCES

Mobility parking should be located as close to activity areas as possible, e.g. entrances to retail, PT stations etc. in order to reduce the distance travelled.

OTHER GUIDES

The minimum number of mobility spaces required, and the geometric standards for mobility car parking and access are prescribed by the New Zealand Building Code D1 and NZS 4121.

1.6 Motorcycle parking

USE

Where there is a significant demand for motorcycle parking, space should be allocated specifically for this. Motorcycle parking can often make use of otherwise wasted areas that are too small to accommodate a car, e.g. at the end of rows. Where such space is not available, design specifically for motorcycles can still have benefits such as allowing multiple motorcycles to be parked in a space that would otherwise hold one car. It avoids motorcycles occupying general parking spaces or being parked on footpaths or access areas.

DIMENSIONS

Typical dimensions for motorcycle spaces are 2.5 m long by 1.2 m wide.

1.7 Cycle parking

OTHER GUIDES

For cycle parking design and requirements, see Cycling Infrastructure of the Engineering Design Code.

1.8 Loading zones

USE

Where there is demand for loading and unloading of goods, particularly in commercial areas, loading zones may need to be provided.

DESIGN CONSIDERATIONS

The design of loading zones must consider the type and size of vehicles that are likely to use the loading zone. While a standard length parking space can often accommodate light courier vehicles, the space should allow for loading goods into and out of the rear of the vehicle. Larger spaces are likely to be required if trucks will be used, with consideration of both the length of truck and the means of loading or unloading. In some cases, this can include lift platforms that extend from the back of the truck.

Loading zones should not be allocated within standard sized angle parking spaces, as this encourages over length vehicles to use the angled space, potentially obstructing the aisle or manoeuvring area behind the space.

DIMENSIONS

Typical dimensions for various types of trucks are shown in the table below.

TABLE 2 **TYPICAL DIMENSIONS FOR TRUCKS**

Truck Type	Length	Width
Small rigid	6.4 m	3.0 m
Medium rigid	8.8 m	3.0 m
Large rigid	13.5 m	3.0 m
Articulated	18-20 m	3.5 m

1.9 Special parking

USE

While most public parking demand is for light vehicles and can be met by standard sized parking spaces, certain locations may have demand for parking by larger vehicles. Examples of this are tourist attractions where there may be a need to accommodate parking by campervans and/or tour buses, as well as near boat ramps, where there is a need to accommodate the parking of boat trailers.

DEDICATED FACILITIES

At such sites, dedicated facilities should be provided for these types of vehicles to avoid them parking inefficiently across multiple standard spaces. The number and size of special parking spaces should be chosen with regard for the likely demand at the site.

DIMENSIONS

The typical parking dimension for a car towing a trailer is 12.5 m long and 2.5 m wide, although this can vary significantly with the size of the trailer. t is recommended that parking surveys are undertaken to establish the common size of vehicle to guide the sizing of the parking space.