

Unitary Plan: Transport

Vehicle Access and Parking/Loading Design

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TRANSPORTATION SPECIALISTS

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EXECUTIVE SUMMARY

This report focuses on the access, parking and loading standards for the inclusion within the Unitary Plan. The purpose of this report is to

- ◆ to develop general standards for vehicle access and design of parking and loading spaces for inclusion in the unitary plan
- ◆ to develop specific standards for the CBD/central area where these need to vary from the general standards above

The actual provision of parking and loading spaces, being the ratios of parking to provide for each land use, is part of a separate brief.

The approach to this project has been to develop access and parking/loading standards for inclusion in the Unitary Plan which are outcome focused. Therefore while guidance has been obtained from the standards of the existing District Plans, the project has identified through workshops and consultation with many Council and Auckland Transport officers who work with these standards on a day-to-day basis, the outcomes that have been delivered by the existing standards, and where improvements to these outcomes could be made. Therefore through this process the outcomes of the existing standards have been challenged. Taking into account the results of a comprehensive literature review of best practice standards and guidance documents relating to access, parking and loading design, new standards have been developed for inclusion in the Unitary Plan.

Specifically the outcomes which the access, parking and loading standards in the Unitary Plan are striving to achieve include:

- ◆ Efficient and safe access for vehicles and pedestrians in and out of properties, including the safety of pedestrians on the footpath when in conflict with vehicles entering and leaving a property
- ◆ Well designed parking areas and parking buildings resulting in ease of use and safety for all types of users, including long stay, short stay, mobility impaired, cyclists and pedestrians
- ◆ Well designed parking and loading areas, with good visual amenity through sleeving, planting and screening.
- ◆ Well designed service areas, resulting in ease for the various type of users

The recommended standards have been developed following a significant review of relevant material, and are consequently considered a robust set of default standards, suitable for inclusion in the Unitary Plan. The recommended standards offer a step change in the design of vehicle access, parking and loading. A focus on pedestrian amenity has been incorporated through many of the standards, aiming to provide a more positive experience for pedestrians. Change has also been recommended in the landscaping and screening of parking areas, attempting to promote aspects of quality urban design, although it is recognised that there may be other assessment criteria needed in order to achieve high quality urban design across the board.

There are instances where a recommended standard may require further consideration or further work for inclusion in the Unitary Plan. It is also recognised that this report focuses on developing the “default” standards for the Unitary Plan – not the rules and assessment criteria, although this review has sought to highlight any “matters of discretion” that need to be considered..

RECOMMENDED STANDARDS – VEHICLE CROSSINGS

Vehicular Crossing Width

The width of a vehicle crossing(s) must comply with the following table, with the measurements illustrated below.

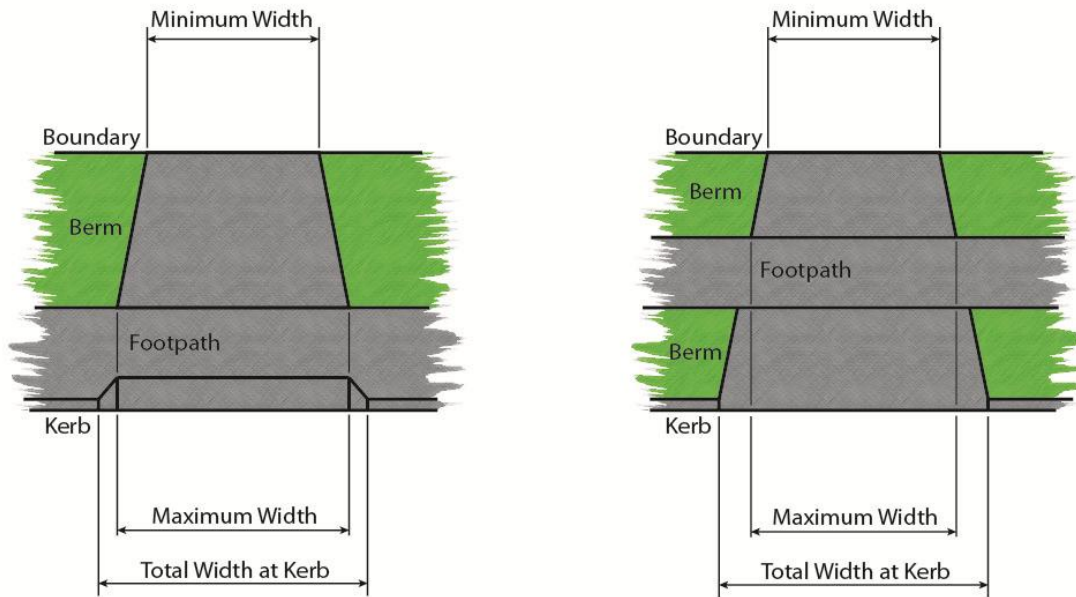
Table 1: Vehicular Crossing Widths

Land Use Activity	Minimum Width of crossing at boundary	Maximum Width – measured at rear of footpath or at boundary in the absence of footpath	Total Width at Kerb
Residential crossing serving 1 – 5 dwellings	2.5 m	4.5 m	5.7 m
Residential crossing serving greater than 5 dwellings	5 m	6.0 m	7.2 m
Non-residential activities	3.0 m (one way)	6.0 m ¹	7.2 m
	6.0 m (two way)	9.0 m ²	10.2 m
Crossings within city centre, town centres and on growth corridors	2.75 m	6.0 m	7.2 m

¹ The maximum width may be increased to 6.0 m where the crossing needs to accommodate the tracking path of large heavy vehicles. This will require resource consent as a restricted discretionary activity

² A maximum width of 9.0 m should only be applied where the crossing needs to accommodate the tracking path of large heavy vehicles

Figure 1: Vehicle Crossing – measurement locations



Vehicular crossings over a footpath must also comply with the following conditions

- i. A vehicle crossing in the central area, town centre, growth area, on a key corridor or on a road serving land uses with high pedestrian activity shall be designed and constructed to retain the continuity of the footpath
- ii. A vehicle crossing shall be constructed in the same material and design as the surrounding footpath and the intersection of the vehicle crossing shall be graded to maintain a continuous footpath plane
- iii. Where a two way crossing exceeds 6.0 m in width at the property boundary, a pedestrian refuge shall be implemented within the access to reduce the effective width a pedestrian is required to cross, with a pedestrian required to cross no more than 6.0 m of a vehicle crossing before reaching a refuge or the opposite side of the vehicle crossing
- iv. Where access to and from a site is across a footpath in a town centre, on a growth corridor or on a road serving land uses with high pedestrian activity, adequate pedestrian sight splays from the vehicle crossing shall be provided. Adequate visibility to pedestrians from a vehicle access can be achieved through splays at the boundary, 2.5 m into the driveway and 2.0 m along the frontage footpath.
- v. A vehicle crossing shall be assessed against the relevant tracking curves applicable to the anticipated largest vehicle to use the access on a regular basis.

Applicants are advised that in addition to the provisions of the Unitary Plan there are also Standard Engineering Details related to the construction or alteration of a vehicle crossing. This information is contained in the Auckland Transport Code of Practice (ATCOP).

Matters of Discretion

The design and width of a vehicle access appropriate for a development depends on:

- ◆ The volume of traffic expected to use the access
- ◆ The pedestrian activity using the footpath
- ◆ The classification of the adjoining road both with regard to the amount of through traffic on the road and the pedestrian movement on the corridor
- ◆ The number of parking spaces served by the access
- ◆ The anticipated largest vehicle to use the access on a regular basis.

Further work required for inclusion within the Unitary Plan

Further work/consideration is required to determine streets/corridors with high pedestrian activity as this may be a subjective assessment unless otherwise stated.

Access Design

Every parking and loading space shall have access from a road in accordance with the following standards:

- ◆ The minimum width of any access is 2.4 m subject to ...
- ◆ All accesses and aisles, including any bends, are to be designed in accordance with the appropriate design vehicle necessary for the movement of vehicles to and from the road and for the manoeuvring of vehicles within the site. In most instances this vehicle will be either a 99 percentile car, or a 99 percentile large truck.
- ◆ Access serving three or more loading spaces, or 10 or more parking spaces, shall be two lanes wide.
- ◆ No building or building platform served by the access is to be, in the case of a residential site, more than 135m from a fire hydrant and in the case of a business site, more than 90m from a fire hydrant
- ◆ Passing bays are required for any accessway within a site which is greater than 50 m in length, . Passing bays shall be provided at 50 m intervals, unless sight visibility constraints require them more often, and shall be designed to allow two vehicles to safely pass each other.

Number of Vehicle Crossings per Site

No more than two vehicle crossings shall be permitted in respect of any site.

Where access to and from a site is across a footpath in a town centre, local centre, growth area, on a key corridor or on a road serving land uses with high pedestrian activity no more than one vehicle crossing will be permitted in respect of any site.

Where additional crossings to a site may be required this will be subject to a resource consent, recommended to be considered as a restricted discretionary activity.

Further work required for inclusion within the Unitary Plan

Further work and consideration is required to determine where access to a site should be limited to only one vehicle crossing. At this stage we have highlighted town centres, local centres, growth areas and streets and corridors with high pedestrian activity. These may require further definition to avoid any subjectiveness as to what a growth area is and what constitutes high pedestrian activity.

Distance between Vehicle Crossings

The following minimum separation distances shall apply to vehicle crossings for the following activities:

- ◆ Non-residential activities: 2 m between vehicle crossings

The minimum separation distance is measured at the property boundary.

Gradient of Access

The maximum grade of an access shall be:

- ◆ For residential activities: 1 in 5 (20%)
- ◆ For all other activities: 1 in 8 (12.5%)
- ◆ Transitions (Figure 2), of a minimum 2.0 m in length, are required where a change in grade exceeds 1 in 8 (greater than a 12.5% change). The transition sections are required to avoid inadequate ground clearance.
- ◆ For curved ramps and driveways, the gradient is measured along the inside radius (Figure 3).
- ◆ The surface of any access and/or vehicle aisles necessary for the manoeuvring of vehicles within any non residential site shall not exceed a gradient of 1:8 in any part.

Figure 2: Ramp Transition Diagram

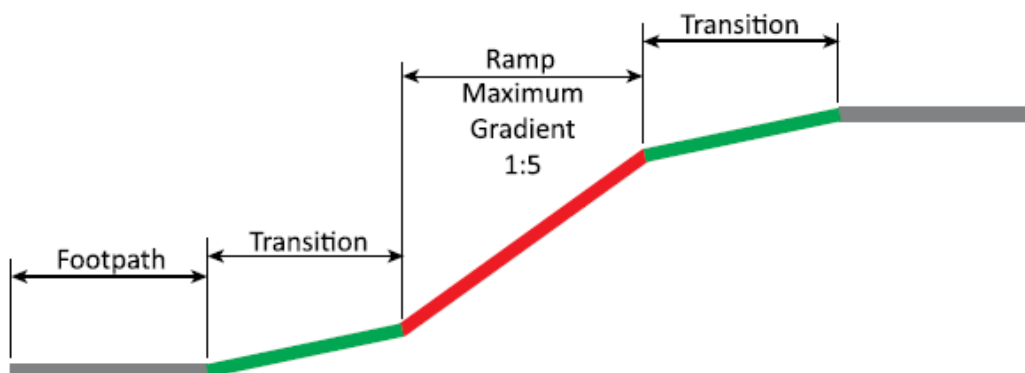
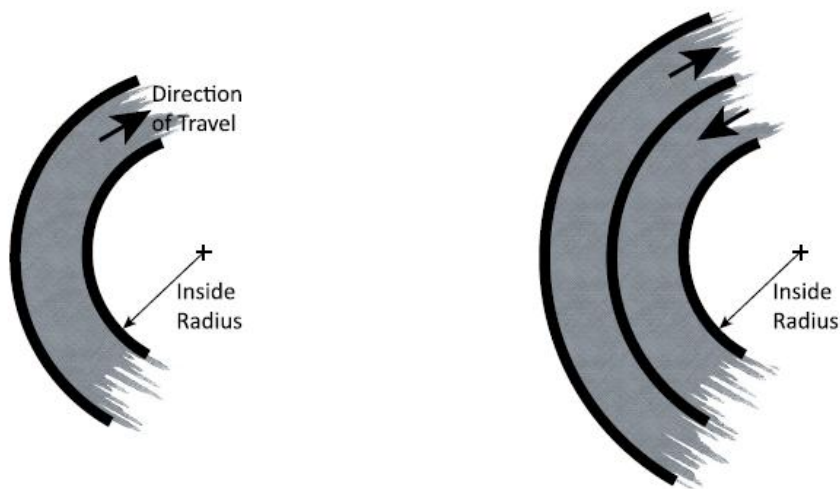


Figure 3: Curved Ramp Diagram



For further information on this matter, guidance can be found in AS/NZS 2890.1:2004

Other Key Design Considerations:

If the vehicle access also serves as the sole pedestrian access to a building, consideration will need to be given to the applicability of NZS 4121.2001 for buildings with high public usage and housing for the aged.

Guidance on gradients of access can be sought from AS/NZS 2890.1:2004. Ground clearance templates are also provided within this standard and may prove useful in checking any complex transitions.

Access Level Platform at the Boundary

An access with a grade steeper than 1 in 20 prior to crossing the property boundary shall be provided with a platform not steeper than 1 in 20, located adjacent to the road boundary. The length of the platform shall be:

- ◆ For residential activities not less than 4.0 m in length
- ◆ For land zoned other than residential, not less than 6.0 m in length

Where the driveway gradient is steeper than 1 in 8, a transition section will be required to ensure adequate ground clearance.

Sight Distance at the Boundary

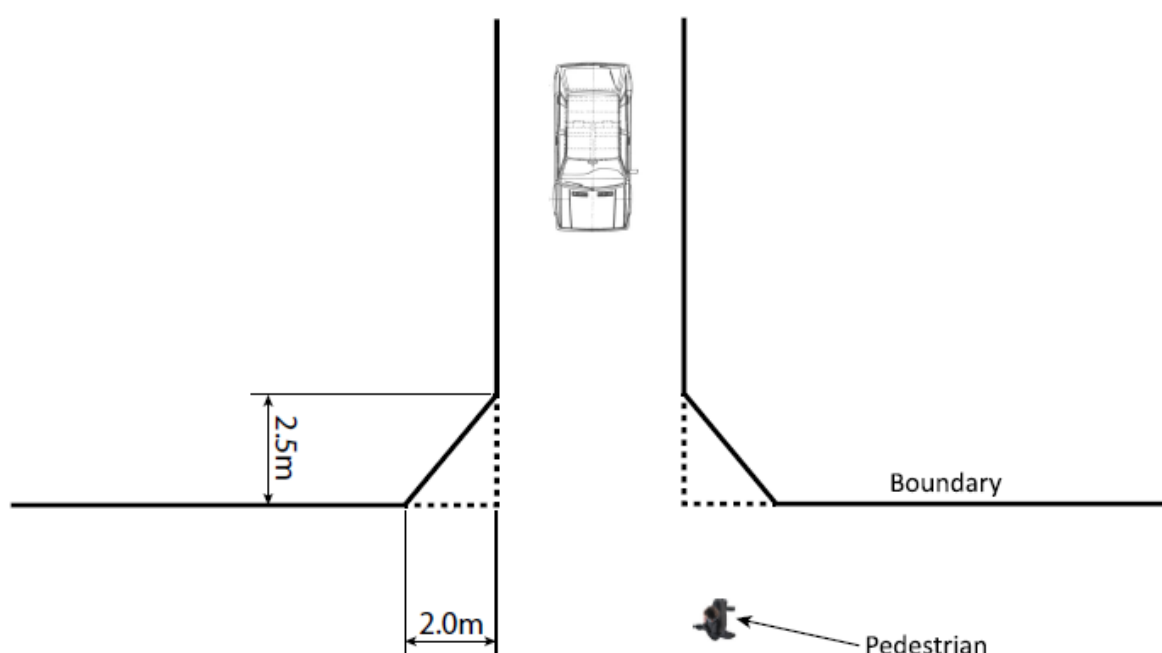
All vehicles accesses shall be located and constructed so that there is adequate sight distance to ensure the safe operation of the access. Adequate sight distance is primarily required:

- ◆ For a vehicle emerging from driveway to adequately judge an acceptable gap in the traffic
- ◆ To ensure adequate visibility between vehicles leaving a driveway and pedestrians on the footpath.

In determining the necessary sight distance requirements guidance shall be taken from the Austroads "Guide to Road Design" publication, and in particular "Part 3: Geometric Design"¹. As a minimum "Stopping Sight Distance" (SSD) shall be achieved at all vehicle accesses.

All vehicle accesses shall be provided with the necessary pedestrian splays to allow exiting vehicles to observe pedestrian movements on the adjoining footpath and react accordingly, illustrated in Figure 4. Adequate visibility to pedestrians from a vehicle access can be achieved through splays at the boundary, 2.5 m into the driveway and 2.0 m along the frontage footpath. Where adequate visibility cannot be achieved a 'car coming' signal triggered by a vehicle detector in the driveway, or other warning device, may be acceptable.

Figure 4: Minimum Sight Lines for Pedestrian Safety



Further work required for inclusion within the Unitary Plan

Consideration may need to be given as to how this may impact on residential properties and the likelihood of fencing and vegetation impeding a pedestrian splay. It may be desirable to "relax" this within residential areas, however areas about "high pedestrian activities" (eg schools) are exactly the areas where such a measure is necessary.

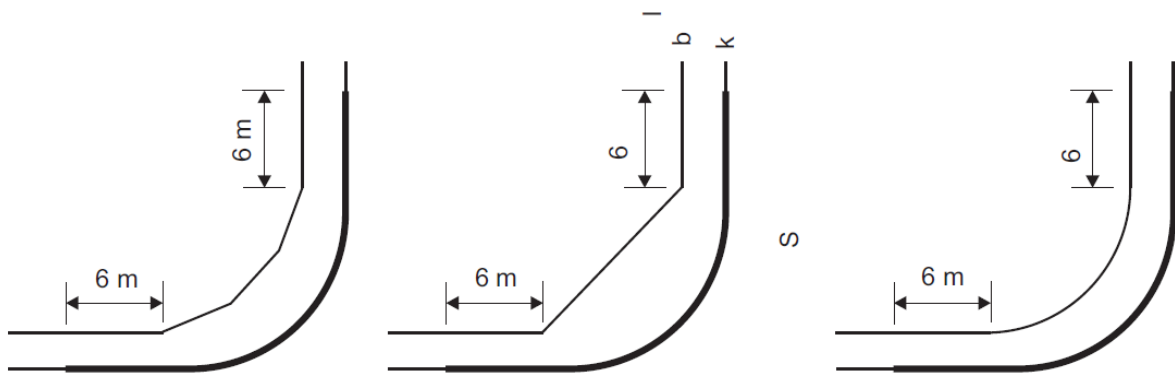
Access Restrictions

Prohibited Access Locations

Vehicle crossing are prohibited from being located within those frontages of a property, at all intersections, as defined in Figure 5 below

¹ "Guide to Road Design Part 3: Geometric Design", Austroads 2010, page 106

Figure 5: Areas Prohibited for Vehicle Crossings²



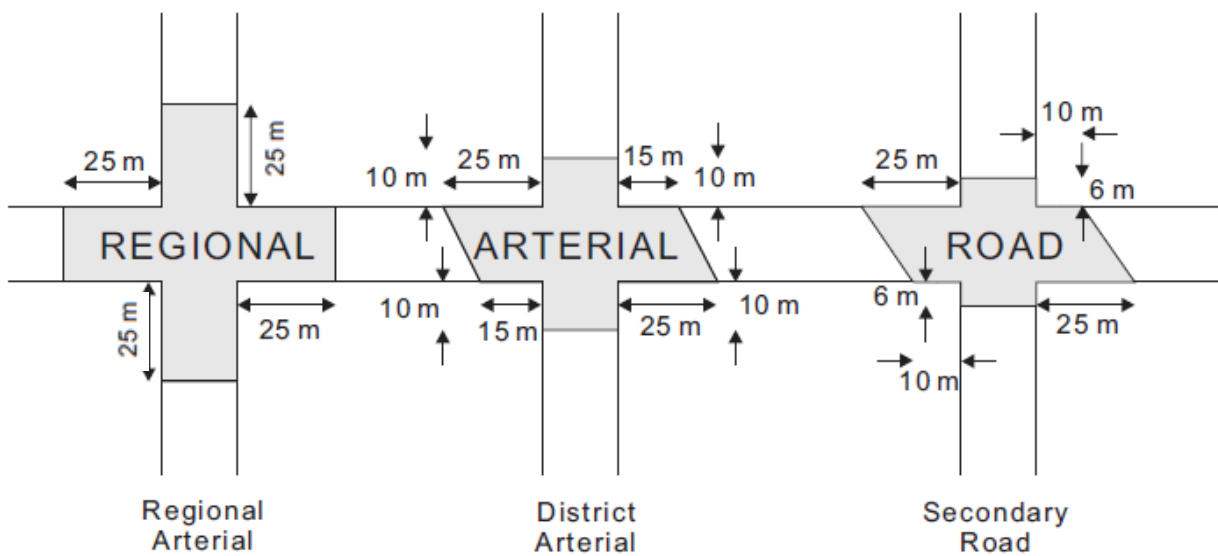
Where: S = road carriageway
 K = kerb
 b = property boundary
 l = property

Defined Road Boundary

A vehicle crossing located within a Defined Road Boundary must be assessed as a restricted discretionary activity.

For the purpose of determining the extent of a Defined Road Boundary, Figure 6 illustrates the extent of a Defined Road Boundary for the relevant road hierarchy.

Figure 6: Extent of a Defined Road Boundary³



² Manukau District Plan: Figure 8.3

³ Manukau District Plan: Figure 8.4

Motorway Interchange Controls

Where an access to a site abuts a Motorway Interchange Control Area shown on the Planning Maps, the use or development of that access shall be deemed to be a discretionary activity

Matters of Discretion for Access Restrictions

In assessing whether an exception to this standard is acceptable Council will have regard to the following matters:

- ◆ Whether adequate sight distance requirements are achieved
- ◆ Characteristics of the land use seeking access, as well as the characteristics of the frontage road
- ◆ Consideration of queue and turn lane lengths at signalised intersections
- ◆ Location of existing services including bus stops, street furniture, landscaping, planting
- ◆ Pedestrian and cyclist requirements
- ◆ The availability of alternative access options and the practicability of implementing a complying design.
- ◆ Whether the access and egress arrangements will adversely affect the ability to access or egress neighbouring sites.
- ◆ Whether the capacity of the adjoining road network is sufficient to accommodate traffic generated by the activity.

Further work required for inclusion within the Unitary Plan

Access restrictions in the vicinity of intersections are typically linked to the road hierarchy of the intersecting roads. Given the variances across the existing District Plans with respect to hierarchy terminology this standard will need to be re-worded in line with the road hierarchy adopted by the Unitary Plan. The above diagrams will also need to be re-created based on the Unitary Plan road hierarchy

Pedestrian Access

Where the vehicle access is the sole pedestrian access to a non-residential site the vehicle access shall not exceed a maximum grade of 1 in 12

Where a dedicated pedestrian access is provided to the site, the pedestrian access shall have a maximum grade of 1 in 12. The pedestrian access shall be located to ensure safe pedestrian movement to and from the site and take account of personal safety (Crime Prevention Through Environmental Design, CPTED)

Vehicle Crossing Formation

All vehicle crossings are to be formed, drained and paved to a permanent dust free (not metal) surface. For unsealed roads where the access grade is not steeper than 1 in 8 up or down from the carriageway, crossings may be formed by using similar materials to that of the existing road surface or better.

The minimum construction standard of an access shall be that set out in the Auckland Transport Code of Practice.

Reinstatement

Where an existing vehicle crossing(s) is altered or no longer required the crossing shall be reinstated as berm and/or footpath and the kerbs replaced. The cost of such work shall be borne by the owner of the property formerly served by the crossing

Reverse Manoeuvring

No reverse manoeuvre greater than 30 m shall be permitted.

Sufficient space shall be provided on the site so that no reverse manoeuvring onto or off a road is necessary for:

- ◆ All rear sites;
- ◆ Sites where four or more parking spaces on the site are served by one carriageway;
- ◆ Sites having access to roads classified as Strategic Routes, or Arterial Roads
- ◆ Sites where the crossing is or will be located within a Defined Road Boundary.
- ◆ Sites having access over a footpath with a high pedestrian activity.

Further work required for inclusion within the Unitary Plan

The restriction requirements with regard to reverse manoeuvres are typically linked to the road hierarchy from which the access is served. Given the variances across the existing District Plans with respect to hierarchy terminology this standard will need to be re-worded in line with the road hierarchy adopted by the Unitary Plan. In addition, as previously mentioned a definition for a high pedestrian activity needs to be verified.

RECOMMENDED STANDARDS – PARKING AND LOADING DESIGN

Parking Space and Manoeuvring Dimensions

Every car parking space, access and manoeuvring area shall comply with the dimensions given Table 2 below and shall accommodate a 99 percentile car tracking template. These car templates are contained within the Unitary Plan. Figure 7 illustrates where these measurements apply to.

Table 2: Parking Space and Manoeuvring Dimensions

Parking Angle	Stall Width (minimum)	Stall Depth		Manoeuvre Aisle Width	TOTAL
		From wall ²	From kerb ³		
90°	2.5	5.0	4.0	7.9	12.9
	2.6			7.0	12

	2.7			6.7	11.7
60°	2.5	5.2	4.2	4.1	9.3
	2.6			3.5	8.7
	2.7			3.3	8.5
45°	2.5	5	4.2	2.6	7.6
	2.6			2.4	7.4
	2.7			2.4	7.4
0° (Parallel) ⁴	2.1	6.0		3.7	

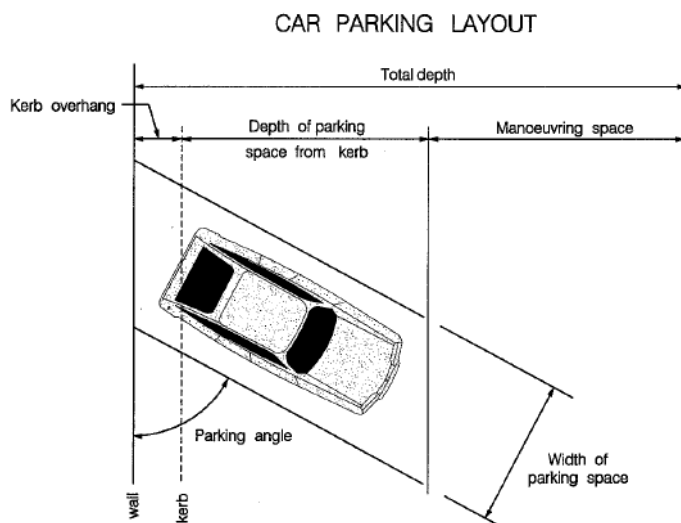
2 – Where parking is to a wall or high kerb not allowing overhang

3 - Kerb overhang – Where a vehicle may overhang the end of a parking space, e.g. at a kerb, provided the first 1.0 m immediately behind it is unobstructed, is not another parking space and is not required as a footpath or for some similar purpose

4 - Parallel Parking:

- ◆ Spaces shall be located 300 mm clear of obstructions higher than 150 mm such as walls, fences and columns
- ◆ The length of an end space where vehicles may enter or leave a space directly can be reduced to 5.4 m minimum
- ◆ Further guidance on parallel parking dimensions can be found in AS/NZS 2890.1:2004

Figure 7: Parking Space and Manoeuvring Dimensions:



Other Key Design Considerations:

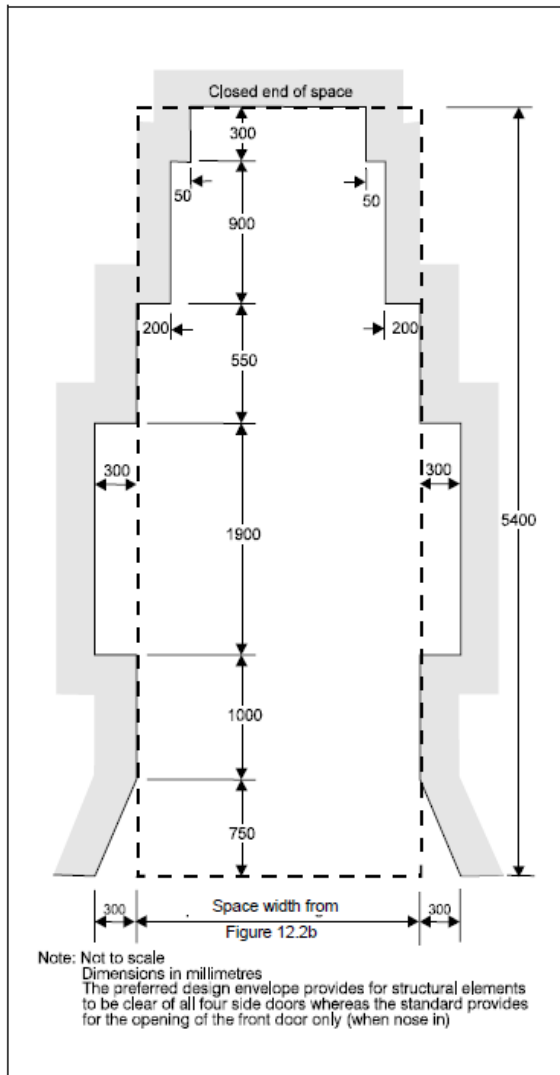
The surface of any required car parking spaces for public use shall not exceed a gradient of 1:20 in any part.

One way traffic is assumed for angle spaces.

Parking spaces adjacent to walls, fences or obstructions such as columns shall be made 0.3m wider to allow doors to open adequately.

Figure 8, being the Preferred Design Envelope, shall apply where a vehicle is parked alongside a column, wall or obstruction.

Figure 8: Preferred Design Envelope around parked vehicle to be kept clear of columns, walls and obstructions⁴



Blind aisles – a blind aisle is an aisle of parking that does not allow vehicle circulation and ends in an obstruction, requiring a vehicle to turn around and travel back in the direction it came from. These are permissible in parking areas so long as they are limited in length to the equivalent of six parking spaces (approximately 15 m). Parking spaces at the end of blind aisles shall be widened by at least 1.0 m to the dimension given in Table 4.

⁴ Source of diagram is Auckland Isthmus District Plan. Diagram is the same as that contained within AS/NZS 2890.1:2004.

Further work required for inclusion within the Unitary Plan

A number of comments received throughout the process suggest that there is some confusion in applying the above standards. Whilst the above has been simplified to some extent, it is difficult to further articulate the required standard beyond that illustrated above. Consequently it is recommended that there may be a further advice note or for on-the-job training that can go into the use of the above standards in more detail, thereby familiarising the necessary staff with how to correctly apply the above.

Disabled Parking Dimensions

In accordance with the Building Act, car parking spaces for people with disabilities shall be provided in accordance with dimensions and ratios provided within NZS 4121:2001. There shall be vertical clearance of not less than 2.5 m along accessible routes in parking buildings and above parking spaces for people with disabilities.

Parking spaces for people with disabilities shall be provided with an accessible route to a building and shall be provided as close as practicable to the accessible entrance or to an accessible lift to the building or facility.

Garage Parking Dimensions

Further work required for inclusion within the Unitary Plan

It is recommended that this is given further consideration as it has been raised as an issue that is lacking direction within the current District Plans. Issues seem to relate to the design of garages being unable to support the tracking of vehicles to and/or from the garage particularly if there is already a vehicle parked within the garage, and the potential for a vehicle to strike a wall/column in trying to manoeuvre.

The standard as included in the City of Ryde DCP seems to address these matters in that it illustrates the need to widen a garage entrance the closer the entrance is to the vehicle manoeuvring area, as well as providing guidance on forward and reverse movements to and from single and double garages.

However there is a need to relate this to Auckland standards and hence it is recommended that a standard similar to that of the City of Ryde be established.

Loading Space Dimensions

Loading spaces shall accommodate a minimum of a 90 percentile truck medium rigid and circulation aisles shall accommodate a 99 percentile truck medium rigid. The turning templates for these vehicles are contained within the Unitary Plan. Notwithstanding this provision should be made for the largest vehicle that will normally access the site. This may be larger than a medium rigid truck.

A loading space designed in accordance with the following will be deemed to comply with this standard

- ◆ The design of each loading space shall ensure that it is fit for purpose, conveniently located and shall be of the following dimensions:
 - For freight depots, carriers' depots, warehouses, manufacturing premises, bulk stores, truck terminals and other similar land use activities, a typical large rigid truck shall be accommodated within the loading space, which shall be 11 m in length
 - For retail premises, non-permanent accommodation, offices a minimum of 8.0 m in length to accommodate a medium rigid truck
 - Offices and other non-goods handling activities, where the gross floor area is not greater than 1,500 m², consideration to be given to the availability to use on street loading spaces or off street parking spaces
 - Medium to high density residential developments, consideration to be given to the availability to use on street loading spaces or off street parking spaces
- ◆ Where articulated vehicles are to access a site, a loading space or docking bay of at least 18.0 m in length shall be provided⁵.
- ◆ No loading space for a truck shall be less than 3.5 m in width
- ◆ Part of any yard of a site may be used to provide a loading space for any site provided that the loading space and method of loading shall at no time: (i) cause the footpath or access to the rear of the site or access to an adjacent property to be blocked; or (ii) create a traffic hazard on the road.

In addition it must be ensured that:

- ◆ All vehicle manoeuvring can be carried out within the site. Sufficient space shall be provided on the site so that there is no reverse manoeuvring onto or off a road from any loading space where the road is a Regional or District Arterial, or where the footpath on the adjacent road experiences a high level of pedestrian activity
- ◆ Loading spaces shall be clearly marked and identified with adequate access to and from the road
- ◆ Loading spaces shall be screened from adjacent sites when adjacent to residential zones
- ◆ Where large waste collection vehicles (front-lift compaction) are anticipated on site these vehicles should be accommodated and loading or unloading refuse shall take place entirely on site.

Restrictions on Parking Location

The use of yard space for parking and loading

The parking requirement in respect of any site in any zone may be satisfied by the use of part of any yard of that site provided that the part so used shall not:

- ◆ impede vehicular access and movement on the site;

⁵ Auckland Central Area District Plan specifies a length of only 11m for an articulated truck despite the standard length measuring 17.9m (RTS18)

- ◆ infringe any open space provided to meet the minimum private open space requirement for each unit in a multiple household unit development;
- ◆ infringe any landscaping provision required by the landscape design

Part of any yard of a site may be used to provide a loading space for any site provided that the loading space and method of loading shall at no time:

- ◆ cause the footpath or access to the rear of the site or access to an adjacent property to be blocked; or
- ◆ create a traffic hazard on the road

Building Line Designations

No required parking or loading spaces, manoeuvring area, or part thereof shall be located between any building line restriction and the road alignment shown on the relevant Planning Map

Vertical Clearance

The minimum overhead clearances to ensure design vehicles can pass safely under overhead structures are as follows:

- ◆ Cars: Absolute minimum 2.1 m
- ◆ Cars where access and parking is required for disability-vehicles: 2.5 m.
- ◆ Vans: 2.5 m
- ◆ Medium-rigid-trucks: 3.8 m

Other Key Design Considerations:

Appropriate warning devices such as a flexible striker bar shall be provided in conjunction with signage wherever the clearance is less than 2.3 m.

Clearances shall be measured to the lowest projection from the roof, eg. fire sprinkler, lighting fixture, sign.

Where a change of gradient greater than 0.1 m occurs, attention must be given to the available headroom.

Tracking

Every vehicle access, parking and loading area shall be assessed with respect to ingress and egress of vehicles to and from the road, and for the manoeuvring of vehicles within the site.

In determining the extent of area required for manoeuvring space, the Council will be guided by the tracking curve diagrams contained within the Unitary Plan.

In applying the tracking curves:

- ◆ These tracking curves are intended for the use in the preparation of internal site designs.
- ◆ For public and customer parking, the 99 percentile car tracking curves shall apply

- ◆ The clearances identified about each vehicle shall be maintained between the vehicle tracking area curve and any fixed object. That is ;
 - 300 mm minimum on each side of the vehicle for manoeuvring (speeds generally less than 10 km/h)
 - 500 mm minimum on each side of the vehicle for circulation (speeds generally greater than 10km/h)
- ◆ The tracking curves provided are only suitable for vehicles manoeuvring in a forward gear and do not represent vehicles reversing
- ◆ Care must be taken in applying the tracking curves, ensuring the vehicle can logically traverse the site as required to meet the tracking movement.
- ◆ Care must also be taken in reproducing or scaling tracking curves, with the horizontal and vertical axes checked to ensure their accuracy following their reproduction

In situations where complex manoeuvres are required the Applicant is to engage the services of an experienced professional in order to verify the suitability of the site manoeuvring.

Further work required for inclusion within the Unitary Plan

Tracking curve diagrams will need to be developed that illustrate the minimum clearance about the vehicle as the existing District Plan tracking curves all differ in this respect. It is recommended for the sake of consistency that the Unitary Plan tracking curves for the larger vehicles should be based on those contained within RTS18⁶: This will require consultation with NZTA in order to ascertain the ability for these to be included in the Unitary Plan. A 90% and 99% car tracking curve will need to be developed as this is not included in RTS 18.

It may also be beneficial for tracking curve diagrams to be maintained on a Council website in order for these to be downloaded and printed at the appropriate scale.

A number of comments received throughout the process suggest that there is some confusion in applying tracking curves. Again, it is recommended that there may be a further advice note or for on-the-job training that can go into the use of the above standards in more detail, thereby familiarising the necessary staff with how to correctly apply them.

Gradients in Parking Areas

The maximum gradient for a parking space to be used by the public shall be as follows:

- ◆ Measured parallel to the angle of parking – 1 in 20 (5%)
- ◆ Measured in any other direction 1 in 16 (6.25%)
- ◆ Within a disabled parking space, and measured in any direction, 1 in 50 (2%)

The minimum gradient, so that parking areas will drain adequately, shall be 1 in 100 (1%) for outdoor areas and 1 in 200 (0.5%) for covered areas.

⁶ “New Zealand on-road tracking curves for heavy motor vehicles” (August 2007)

The maximum gradient for a manoeuvre area shall not exceed 1 in 12.5 (8%)

Pedestrian Movement

The design principles for a parking layout, with respect to pedestrian movement are:

- ◆ Provide sight distances appropriate for the likely operating speed in all parking areas addressing potential pedestrian /vehicle conflict. This will often require splayed corners on structures and careful treatment of landscaping and sign placement in areas of potential conflict
- ◆ Ensure no reversing of vehicles, particularly service vehicles, in areas of high pedestrian activity
- ◆ Provide measures to enhance the security of people using the parking area

All parking areas shall provide a clearly defined pedestrian path/network that:

- ◆ Closely follows pedestrian desire lines linking the pedestrian footpath in the adjacent road to the front door of the land use activity
- ◆ Minimises the need for pedestrian movements to cross vehicle paths as is practicable
- ◆ Minimises the potential for pedestrians/vehicle conflict. At conflict points of major pedestrian routes and vehicle routes through a site, pedestrian movement will have priority over vehicle movements and vehicle operating speeds shall be managed to be below 30 km/h

Further work required for inclusion within the Unitary Plan

Given that this is a new recommendation for the Unitary Plan, the above may require further consideration by the appropriate staff at Auckland Council and Auckland Transport.

Bicycle Parking

The design and location of cycle parking spaces shall be guided by Auckland Transport Code of Practice (ATCOP)

Further work required for inclusion within the Unitary Plan

Outcomes of the Auckland Transport review of ARTA's Guidance Note for Cycle Parking Facilities (2007) are to be incorporated into the Unitary Plan.

The Austroads standards diagrammatically represent the above requirements, making it much easier to understand. If necessary these diagrams could be included in the Unitary Plan.

Motorcycle Parking

The recommended minimum dimensions for motorcycle parking spaces, if provided, are 2.5 m by 1.2 m. The gradient of a motorcycle parking space shall not exceed 1:50 (2%).

Parking and Loading Area Formation

Before commencement of the Permitted Activity of that site, all parking and loading spaces, vehicle access and manoeuvring areas and aisles shall, before the commencement of the activity, be formed,

finished with an all-weather dust-free surface, drained, marked out or delineated and maintained to the satisfaction of the Council.

Further work required for inclusion within the Unitary Plan

There is a need to consider whether this is a standard in its own right, whether it forms part of the overall assessment criteria for the design of parking and circulation areas.

Ensuring parking spaces are kept clear and available for use

Parking areas must be kept clear and available at all times, free of impediment, for vehicles used in conjunction with the particular activity to which the parking spaces relate on the site, and must not be used for the deposit or storage of any goods or materials or for any other purpose.

Further work required for inclusion within the Unitary Plan

We note the inclusion of “for vehicles used in conjunction with the particular activity” to avoid the leasing or on-selling of excess parking being able to occur as a permitted activity. We recognise the advantages of shared parking the likelihood of the Unitary Plan encouraging this. However this needs to be dealt with on a case by case basis, and not as part of a default, generic standard.

Vehicle Queuing

Sites shall be laid out in such a way that vehicles using or waiting to use fuel dispensers, ticket vending machines, remote ordering facilities and devices, entrance control mechanisms, or other drive through facilities shall not queue into the adjoining road or obstruct entry to or exit from the site.

Stacked Parking

Stacked parking occurs when access to a parking space is achieved through another parking space. This can refer to both horizontal and vertical stacking (mechanical)

Stacked parking may be permitted in the following circumstances

- ◆ Associated with residential development stacked parking may be approved where no feasible alternative exists, and the stacked parking is held in common ownership under a single title and cannot be offered or allocated as individual parking spaces.
- ◆ Stacked parking can be provided for vehicles being serviced at vehicle repair premises.
- ◆ In some circumstances stacked parking may be allowed as a means of providing staff parking. The staff parking area shall be clearly defined, marked and separated from other required parking on the site.
- ◆ Any stacked parking shall not compromise the operation of the remainder of parking area.

Where development includes a mechanical parking installation, such as car stackers, turntables, car lifts or other automated parking systems, the development shall be specifically designed to the satisfaction of the Council.

Access to mechanical parking installations such as car stackers, shall be by means of access driveways and circulation roadways designed in accordance with the relevant criteria within the Unitary Plan. Sufficient vehicle storage shall be provided to ensure that queues of vehicles awaiting service by the installation do not extend beyond the property boundary of the parking facility under normal foreseeable conditions.

Urban Design – Good Design

Further work required for inclusion within the Unitary Plan

In attempting to develop a recommended standard to address this issue it becomes apparent that this standard may be better linked to a land use zoning, or whether there will be independent “urban design” criteria within the Unitary Plan. Consequently if there is a need to include commentary within the parking and loading design chapters, there is a need to understand more clearly what is being sought elsewhere in the Unitary Plan.

Therefore a recommended standard has not been suggested at this stage.

Landscaping

Further work required for inclusion within the Unitary Plan

As opposed to developing a specific standard it is recommended that the need for landscaping of a parking area be identified as part of the assessment criteria for the consent process. This could therefore address a range of landscaping matters including planting and maintenance specifications, landscaping separation of parking areas from footpaths, perimeter planting/screening, planting being setback for amenity reasons and so on.

Screening

Where four or more parking spaces are provided on a site which is adjacent to, or faces land zoned residential or open space, the area comprising such spaces shall be screened from residential or open space zoned properties

Screening shall be provided in the form of fencing or landscaping, in order to reduce to an acceptable level any adverse aural or visual impacts on residential and open space zoned properties

Further work required for inclusion within the Unitary Plan

A number of comments were received with regard to this recommendation, and in particular how the screening is designed to ensure no adverse CPTED issues, or big blank walls that have no visual appeal. Consequently there may be a need to consider further assessment criteria to ensure the appropriateness of any screening. It may also be that other aspects of the Unitary Plan deal with this, for example good urban design objectives may provide a better mechanism for which to achieve the appropriate screening design

Lighting

Parking areas and circulation areas, together with pedestrian pathways that are anticipated to be used during the hours of darkness, shall be adequately lit. Illumination shall not be directed towards any adjacent residentially zoned land.

Further work required for inclusion within the Unitary Plan

The above standard is taken from the off-street parking standard, AS/NZS 2890.1:2004. It includes parking areas, circulation areas and pedestrian pathways. Including parking areas seems to differ slightly from the Manukau District Plan which states that lighting shall be provided in access driveways and pedestrian areas within public parking areas. It is thought the intent is that lighting is provided within the actual parking area as well.

It is recognised that further work is likely to ensure the intent of this standard is achieved.

Fractional Spaces

When the calculation to assess parking space requirements results in a fraction, if the fraction is less than one half it shall be disregarded, if half or more than one whole additional parking space shall be required.

Small Car Parking Spaces

Further issues to consider for the Unitary Plan

The following is not a permitted activity, but could be included as assessment criteria relative to the design of parking areas.

Spaces suitable for small cars only may be considered within a car-parking area, provided that it would be impractical to provide all spaces to 90-percentile standard, and that the number of small spaces is no more than 10% of the total number.

RECOMMENDED STANDARDS – CENTRAL AREA

The recommended standards identified above are largely applicable to the Auckland Central Area. Accordingly the following section concentrates on the possible modifications to these standards which are relevant to the Auckland City Centre. It is expected that while these recommended standards relate to the Auckland City Centre they may also be applicable to other large centres in the Auckland region. The following identifies specific recommended standards for the Central Area

It is highlighted that as part of a separate commission Transport Planning Solutions and Urbanismplus (TPS & U+) are developing parking standards for the Central Area, with urban design matters having been identified within their draft report (dated 26 October 2011). Section 7.2 provides the matters of the TPS & U+ relevant to this report, being vehicle access, parking and loading to ensure consistency, or identify the points of difference that may require further consideration.

Access Restrictions

Where a site has frontage to more than one road and/or service lane, access shall be obtained from the road or service lane that is lower on the road hierarchy. Where the road or service lane frontages all have the same classification in the hierarchy, then vehicular access shall be obtained from the road or service lane carrying the lesser volume of traffic.

Further issues to consider for the Unitary Plan

This standard could be broadened to include town centres. This will be dependent on how the new Unitary Plan classifies town centres as well as the road hierarchy to be adopted within the new plan. This recommendation could be included as a general recommendation for all vehicle crossings in the region.

Urban Design

Further issues to consider for the Unitary Plan

Urban design is a critical element within the Central Area, given the high concentration of both pedestrian, private vehicle and public transport movements through this area. It is difficult to develop necessary access, parking and loading standards without understanding how these correlate to urban design matters within the Unitary Plan.

Screening of Parking

The TPS & U+ draft report makes a number of recommendations as to the screening and sleeving of parking spaces, as summarised in Table 8: . Given that this matter is of greater relevance to achieving good urban design we recommend that adoption of the TPS & U+ recommendations

Porte Cochere

Porte cochere are not favourable within the Central Area and are therefore not a permitted activity. The provision of a porte cochere within a development will be subject to relevant assessment criteria

Matters for Discretion

A porte cochere may only be permitted for developments subject to urban design, streetscape and pedestrian amenity considerations.

Where practicable a porte cochere should be internal to the building with the vehicle access to the porte cochere kept to the absolute minimum.

Further issues to consider for the Unitary Plan

Further assessment criteria are likely to be necessary, particularly in regard to providing further matters around urban design, streetscape and pedestrian amenity considerations

Bus and Coach Parking

All bus and coach parking spaces shall:

- ◆ Have minimum dimension of 12.6 m long and 3.5 m wide, with a vertical clearance of at least 3.8 m
- ◆ Are to be designed to preclude any unsafe reverse manoeuvres.

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1 INTRODUCTION

Flow Transportation Specialists Ltd (Flow) has been commissioned by Auckland Council (Council) to develop general standards for vehicle access and for the design of parking and loading spaces for inclusion in the Unitary Plan, with the need to consider specific standards for the CBD/central area where necessary. The key deliverables of the project are as follows.

- ◆ A generic set of vehicle access and parking/loading design standards, recommended as suitable for use as the default standard throughout the Auckland region
- ◆ Any modifications needed to these general standards above to address the specific requirements of the City Centre/CBD
- ◆ An accompanying report which describes the process by which the recommended standards have been developed and gives robust reasons for the recommendation. The report must be suitable for release as part of the Section 32 background material for the Unitary Plan.

The overall approach to the project has been to develop access and parking/loading standards for inclusion in the Unitary Plan which are outcome focused. Therefore while guidance has been obtained from the standards of the existing District Plans, the project has identified through workshops and consultation with many Council officers who work with these standards on a day-to-day basis, the outcomes that have been delivered by the existing standards, and where improvements to these outcomes could be made. Therefore through this process the outcomes of the existing standards have been challenged. Taking into account the results of a comprehensive literature review of best practice standards and guidance documents relating to access, parking and loading design, new standards have been developed for inclusion in the Unitary Plan. Specifically the outcomes which the access, parking and loading standards in the Unitary Plan are striving to achieve include:

- ◆ Efficient and safe access for vehicles (including freight) and pedestrians in and out of properties, including the safety of pedestrians on the footpath when in conflict with vehicles entering and leaving a property
- ◆ Well designed parking areas and parking buildings resulting in ease of use and safety for all types of users, including long stay, short stay, mobility impaired, cyclists and pedestrians.
- ◆ Well designed parking and loading areas, with good visual amenity through sleeving, planting and screening.
- ◆ Well designed service areas, resulting in ease for the various types of users

This report outlines the details with regard to the above process and summarises the research and assessment of these findings. Further detail is given with regard to the outcomes of the consultation process and the resulting reasons for our recommended standards. The report is presented in the following sections.

- ◆ A review of the current standards as contained in the existing legacy District Plans, (including relevant recent Plan Changes) of the seven amalgamating Councils in the Auckland region
- ◆ A literature review of existing best practice with regard to design standards for access provision, parking and loading facilities, including international examples

- ◆ The outcomes of the workshop held with Council officers who are experienced with the application and outcomes of the existing standards.
- ◆ Discussion on the preferred outcome as to how to incorporate the above literature review into the new Unitary Plan
- ◆ Discussion on the various design standards relating to vehicle access, parking and loading design including:
 - ◆ General discussion and concluding comments
 - ◆ Our recommended standard, including justification for the recommendations
 - ◆ Any further work that may be required to be able to include the recommendation within the Unitary Plan.

2 EXISTING AUCKLAND DISTRICT PLANS

A review has been undertaken of the current standards as contained in the existing legacy District Plans, (including relevant recent Plan Changes) of the previous seven Councils in the Auckland region.

The Auckland region consists of significantly differing areas, including both urban and rural. To understand the variations within the existing legacy District Plans we have compiled a table outlining how each District Plan deals with the various components of access, parking and loading design. These are contained in Appendix A.

2.1 Updates

The following nine legacy documents from the previous seven councils have been reviewed. The dates indicate when the documents became operative, but there are also various more recent updates that are incorporated into the documents showing that they are in fact 'living' documents.

- ◆ Auckland Isthmus Section 1999
- ◆ Auckland Central Area Section 2004
- ◆ Hauraki Section 1996 and 2009
- ◆ Manukau District Plan 2002
- ◆ North Shore City District Plan 2002
- ◆ Waitakere Code of Practice 2010
- ◆ Rodney District Plan 2011
- ◆ Papakura District Plan (Urban and Rural sections) 1999
- ◆ Franklin District 2000

It can be seen that the most recent of the above are the Waitakere Code of Practice which came into use in August 2010 and the Rodney District Plan which became fully operative in July 2011. It is highlighted that the Waitakere Code of Practice guidelines do not form part of the district plan and can only be referred to when a resource consent is triggered. The Waitakere District Plan is considerably different to the other District Plans in the way it deals with the parking and loading standards. The

District Plan is based around “Environment” types with each Environment containing its own rules relating to parking, access and driveways. There are no standard rules as they all slightly differ between Environments. Some of the Environments direct the user to the Code of Practice to seek compliance and assessment criteria, whilst others have rules contained within the Environment chapters, outlining activity status and assessment criteria.

2.2 Summary

Appendix A shows the different rules and how each council previously dealt with these. Section 5 and 6 provide further detail with regard to each aspect.

As noted above Waitakere supplies a code of practice for parking, loading and access in addition to the District Plan. This code of practice outlines in significant detail the requirements for each area and is very prescriptive.

With regard to Waitakere’s code of practice and the other District Plans there many similarities, but also some significant differences. Some of the differences include:

- ◆ Maximum gradients are 1 in 4 or 1 in 5 for residential, with the exception of Waitakere where 1 in 3 is permitted. Of note is that the Rodney and Franklin plans do not provide a maximum gradient for vehicle accesses.
- ◆ Grade transitions for vehicle accesses are specified in only three district plans. A grade transition is a section of the access where the gradient is appropriately configured in order to lessen the overall change in gradient at a certain point. This is necessary to avoid a vehicle scraping or bottoming out if a change in gradient is too great – hence a grade transition removes this issue.
- ◆ The inclusion of a rule with regard to the maximum total crossing width as a percentage of the site frontage (only contained within the Isthmus, Central and Franklin plans)
- ◆ A ‘level’ platform where an access meets the road reserve is not a requirement within all the district plans.
- ◆ Sight distance requirements are a notable omission within most of the district plans.
- ◆ Vehicle tracking curves all vary slightly in terms of the dimensions as do whether the District Plan provides tracking for a 90% vehicle, a 99% vehicle or both
- ◆ Each council supplies parking space dimensions which are all marginally different and differ from the NZS/AS 2890.1. The use of different user classes is not widespread.
- ◆ The loading spaces dimensions are detailed within all the District Plans, except the Franklin District Plan, and there are varied requirements.
- ◆ Cycle parking requirements are discussed only in the North Shore and Waitakere documents with reference to Austroads.
- ◆ All districts refer to NZS4121 for disabled parking requirements, with the exception of Papakura and Franklin.
- ◆ Landscaping design is only a requirement within the Manukau, Waitakere and Rodney documents.

- ◆ The requirement for parking and loading areas to be properly formed, drained, sealed and delineated is stated within all but the Waitakere code of practice (note that this document is the most recent of the nine documents).

The above is only a summary of the important points of comparison relevant to this scope of works and is included to give an understanding as to the scale of variation that exists between the District Plans. As mentioned the full detailed comparison is contained within Appendix A and has been used when compiling the information contained within Sections 5 and 6.

2.3 Auckland Central and Isthmus Sections

One of the important comparisons that have been made is that between the Auckland Isthmus and Central Area sections. Whilst these areas are significantly different in their urban form there are not significant differences in the transportation rules contained within the respective plans.

The following differences have been noted:

- ◆ The number of permitted vehicle crossings per site (Isthmus permits two, Central Area permits one in pedestrian orientated areas and two elsewhere)
- ◆ Access from multiple road frontages (Isthmus n/a, Central requires access only from road of lower hierarchy/volume)
- ◆ Bus/coach parking requirements (Isthmus n/a, Central requires for certain land uses, dimensions given)

One of the major goals of the Central area plan is the improvement of access for vehicular and pedestrian traffic and it can be seen in the above difference between plans with respect to the number of vehicle crossings permitted per site.

2.4 Related Plan Changes

Whilst there have been a number of plan changes that have assessed the parking and loading requirements within a particular area,, many of these are strongly focussed on the provision of parking as opposed to the design. The following provides an assessment of two of the more recent plan changes to understand what matters have been addressed. The Newmarket and New Lynn Plan Changes are also tow of the “bigger” plan changes in terms of the areas each plan change covers.

A summary of relevant Plan Changes are provided in Table 3

Table 3: Plan Changes

Plan Change	Status	Key Matters
Plan Change 196 (Newmarket)	On appeal Notified in 2007	<p><i>To create a built environment in Newmarket that retains character buildings and displays high quality urban design</i></p> <ul style="list-style-type: none"> • <i>There is a positive relationship between the building and the street, and in particular the building has an active frontage</i> • <i>By ensuring that car parking buildings and carparking areas are either</i>

		<p><i>sleeved with development containing active uses or are located underground or to the rear of existing development so as to avoid negative impacts on the streetscape</i></p> <p><i>New buildings and accessory buildings (including external additions and alterations). The extent to which</i></p> <ul style="list-style-type: none"> • <i>Service and vehicle access interruptions to the continuity of building frontage are minimised.</i> • <i>Carparking has been located underground, to the rear of the building, or is separated from the street frontage by other uses which activate the street</i> <p><i>Site Intensity: bonus floor area offered for underground car parking</i></p> <p><i>The street level and lower levels of all buildings must comply with the following:</i></p> <ul style="list-style-type: none"> • <i>Residential activity and/or car parking may not be located on the ground floor or at street level unless retail/commercial activity fronts the street and the residential activity and/or car parking is located to the rear of the retail/commercial activity</i> <p><i>Vehicle access</i></p> <ul style="list-style-type: none"> • <i>Sites within the core parking area (refer to the Newmarket Growth Area Structure Plan diagram) shall not have any new vehicle access created off Broadway, Khyber Pass Road, Nuffield Street or Remuera Road.</i> • <i>On all other sites, sites with a frontage of less than 50m shall not have more than one vehicle access and the width of that accessway shall be not more than 5m</i>
<p>Plan Change 17 New Lynn</p>		<p><i>As New Lynn becomes more built-up, it is important the Town Centre develops more people-friendly streets, both in the core, and in links with the surrounding community. People-friendly streets are attractive and lively, with:</i></p> <ul style="list-style-type: none"> • <i>Interesting building facades and well-designed shop fronts</i> • <i>Ease of access into and between buildings</i> • <i>Trees and street furniture, where pedestrian movement and safety is not compromised.</i> <p><i>Activities shall provide for</i></p> <ul style="list-style-type: none"> • <i>the location and design of access to car parking and loading areas, including areas for reverse manoeuvring to ensure that the safe and efficient functioning of adjacent roads, according to the positioning of</i>

		<p><i>that road in the Roading Hierarchy, is not adversely affected</i></p> <p><i>Off-street carparking within the core of the Henderson and New Lynn Community Environment and the entire Community Environment (New Lynn) shall be provided in a way that</i></p> <ul style="list-style-type: none"> • <i>protects and enhances the visual amenity and pedestrian based character of the area, by ensuring the provision of parking at side or rear of a site and avoiding parking at street frontage</i> <p><i>Assessment Criteria for Parking, Loading and Driveway Access</i></p> <ul style="list-style-type: none"> • <i>The extent to which provision can be made for the safe movement of pedestrians from car parks to the building or activity the car parking serves.</i> • <i>The extent to which all car parking, loading spaces and driveways are screened from any Residential Activity within the Living Environment.</i> • <i>The extent to which car parking and loading areas are located to allow efficient and safe access to the activity for which that car parking and loading area is provided including separate provision for pedestrians.</i> • <i>The extent to which provision is made for on-site turning of vehicles to avoid reverse movement between the car parking or loading area and the road where the reverse manoeuvring would disrupt the safe and efficient functioning of the road.</i> • <i>The extent to which driveway access from the road is located and designed to allow safe and efficient movement on and off the road, including the extent to which car parking is constructed of maintenance free materials, adequately drained and well marked out.</i>
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Whilst these are all valuable criteria and objectives, many of the above do not lend themselves easily to generic standards. Many of the examples above have been developed as policies specific to the plan change area, with the method to achieve that policy being identified.

The New Lynn Plan Change 17 identifies a number of assessment criteria that can be addressed within the generic standards

3 BEST PRACTICE RESEARCH

3.1 Australian and New Zealand Standards

There are a number of official Australian and New Zealand standards with regard to the design of parking, loading and vehicle access. These include joint Australian/New Zealand standards as well as Australian only, and New Zealand only standards.

The following sections outline the key aspects of each of these standards, together with a brief discussion and recommendation as to the applicability of the standard with regard to the design standards to be included in the Unitary Plan. A full tabulated review of the standards is contained within Appendix B.

3.1.1 AS/NZS 2890.1: 2004 Off-Street Parking

AS/NZS 2890.1:2004 is the current standard for Australia and New Zealand with regard to off-street parking. The previous standard was AS/NZS 2890.1:1993, i.e. this was previously updated in 1993.

The standard is well recognised within the traffic engineering and architectural industries and is regularly referred to with respect to the design and operation of off street parking areas. Generally it provides for the use of smaller parking dimensions, gradients etc compared to some of the existing District Plans. The reason for this difference is due to the fact that the AS/NZS 2890.1 standard is based on a classification of user types within a parking area, thereby being more detailed than the existing District Plans which predominantly have one, or some cases two, user classes (regular and casual users).

A full summary of this standard is provided in Appendix B and includes the following matters with regard to the design of off street parking facilities.

- ◆ Different user classification (six categories), including
 - employee/commuter parking (all day)
 - residential parking
 - long/medium term parking (long term town centre parking, sports facilities, hotels)
 - short-term/low turnover (short term town centre, hospitals, medical centres)
 - short term/ high turnover (shopping centres)
 - mobility impaired parking
- ◆ Dimensions of different angled parking spaces (30°, 45°, 60° and 90°) and requirements for dimensions based on user class
- ◆ Gradients within parking areas
- ◆ Provision for pedestrians
- ◆ Provision for motorcycles
- ◆ Circulation roadways and ramps (widths and gradients)
- ◆ Access driveways width and location based on class of parking facility/user class
- ◆ Access driveway locations
- ◆ Sight distance at driveways
- ◆ Queuing lengths required based on vehicles use
- ◆ Bicycle parking refers to AS 2890.3
- ◆ Signs and markings for parking areas
- ◆ Lighting refers to AS 1680.2.1 and AS/NZS 1158.3.1

- ◆ Design envelope for parking space
- ◆ Vertical clearances
- ◆ Vehicle dimensions (85th percentile, 99th percentile, van, small car) and tracking curves (85th percentile, 99th percentile)
- ◆ Ground clearance templates.

It can be seen that there is a large amount of very detailed information provided within this standard. This leads to the standard being very comprehensive but at the same time it may not be considered “easy to use” by non-professional users. That is to say, those practitioners who deal with these matters daily understand the document but it may not be user friendly to others.

Currently the existing District Plans together cover most of the topics listed above but no single District Plan covers every area, and no District Plan goes into the level of detail provided in this standard. Further the Auckland Isthmus and Waitakere District Plan are the only district plans that currently makes distinction of different user types of parking spaces, with regular and casual users identified.

Consideration has been given to the relevant design elements within AS/NZS 2890.1: 2004 and whether these should be included within the Unitary Plan. Specifically the use of parking user classes could be included thereby enabling parking areas to be designed to cater for the type of users. This enables smaller parking dimensions to be adopted if the use of the facility is by regular users only. AS/NZS 2890.1: 2004 could be mentioned in the Unitary Plan as a guidance document providing guidance in the layout design of parking areas and parking buildings. This standard also provides explanations of transitions, ground clearances and other design related aspects that may be too detailed for simple parking design, but are important for larger or more complex parking areas.

It is however recognised that the use of user classes may be subjective unless the user classes are clearly defined within the Unitary Plan. This could therefore introduce a level of uncertainty as to the “permitted” nature of a development. This matter is considered further as part of developing the recommended standards for parking design in Section 6.1.

3.1.2 NZS 4121: 2001 Design for Access and Mobility – Buildings and Associated Facilities

The existing District Plans generally only refer to one external standard with regard to the design of mobility impaired parking spaces, NZS4121:2001 Design for Access and Mobility. A small part of this document provides standards for the design of parking spaces for the mobility impaired, including information on parking space dimensions and headroom. There is also information within this standard with respect to the provision of an accessible route, dealing with footpath design

It is recommended that the information provided in NZS 4121: 2011 should be retained within the Unitary Plan. The standard could be referenced, or the information placed within the Unitary Plan. The relevant section of NZS 4121: 2011 is Section 5, relating to the design of car parks

3.1.3 AS 2890.5: 1993 Parking Facilities Part 3: Bicycle Parking Facilities

The bicycle parking facilities standard is an Australian standard produced in 1993. It is a relatively concise 18 page document and while it is not widely used in the New Zealand industry it does provide

a comprehensive standard with regard to the design of bicycle parking facilities. The following key areas are covered in the standard.

- ◆ Division of parking facilities into user class 1 to 3 (high, medium, low security)
- ◆ Storage requirements regarding storage layouts - lockers, open rows, nose to tail, vertical storage, open plan layouts
- ◆ Gradient of floors
- ◆ General requirements regarding location and clearances of cycle parking (to vehicle and pedestrian traffic), and safety of pedestrians
- ◆ Signage requirements and type of signs where necessary
- ◆ Lighting requirements for areas to minimise theft and vandalism. Reference is made to AS 1158.1 Lighting for Roads and Public Spaces
- ◆ Weather protection, security
- ◆ Access path requirements
- ◆ Typical parking facilities, description and diagrams are included in the appendix.

This standard contains a large amount of useful information for bicycle parking facilities. However this information is very “design specific” and could prove too confusing for inclusion within the Unitary Plan. The best way to incorporate this into the Unitary Plan may be to suggest guidance for bicycle parking can be sought from this document, and not necessarily require this to be a permitted activity standard. Of relevance is Section 2, being the design of bicycle parking facilities.

Auckland Transport is currently reviewing the current bicycle guidelines included in Appendix E of the ITA Guidelines. The outcomes from this review may be able to be incorporated or referenced into the Unitary Plan as it is understood that Auckland Transport are looking to simplify. Until such time as this review is completed it is recommended that the Unitary Plan take guidance from AS 2890.5.

It is recommended that design standards relating to bicycle parking facilities be based on the findings of the Auckland Transport work to ensure consistency.

3.1.4 AS 2890.2: 2002 Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities

The off-street parking facilities standard is an Australian standard and is a lengthy document at around 44 pages. While the standard is not widely used in the New Zealand industry, it is a comprehensive document with regard to the provision and design of commercial vehicle parking and access facilities. The following key matters are addressed within the standard.

- ◆ Classes of design vehicle including small rigid vehicle (SRV), medium rigid vehicle (MRV), heavy rigid vehicle (HRV), articulated vehicle (AV) (dimensions given)
- ◆ Three categories for access design including “occasional access”, “regular service - major road”, “regular service - minor road,” with requirements for access design to be based on these categories
- ◆ The swept path of the design vehicle likely to use the facility
- ◆ Deals extensively with the design of loading docks as well as service areas

- ◆ Minimum dimensions for driveway sight splays for pedestrians
- ◆ Minimum design layouts provided for one-way and two-way driveways.
- ◆ Design vehicle turning path templates given and design vehicle ground clearance diagrams.

The division of design vehicles into different classes and the three categories of access design are positive aspects of this standard which could be included within the Unitary Plan. This is similar to what is already contained within in many of the existing District Plans in as much as 90% and 99% tracking curves for service vehicles are included in the District Plans.

Consideration has been given as to whether the design standards relating to different classes of commercial vehicles should be included in the Unitary Plan. However this poses a similar issue to that discussed with respect to user classes for the design of parking spaces

Much of the information in AS 2890.2:2002 already exists in the District Plans, and it is recommended that this be retained.

3.1.5 AS 2890.3: 1993 Parking facilities Part 5: On Street Parking Facilities

The on street parking facilities standard provides similar information with regard to the design of parking spaces to that contained in the above three standards, but focussing on the on-street parking facilities. As most on-street parking facilities are managed by Auckland Transport, it is considered that the inclusion of this information within the Unitary Plan is not necessary. Notwithstanding this there are certain aspects of the standard which are relevant to the Unitary Plan including:

- ◆ Provision for pedestrians in the design of parking spaces such as the provision of wheel stops to prevent encroachment of vehicle onto a footpath
- ◆ Provision for end clearances (ie no stopping areas on approaches to intersections)
- ◆ Provision for special groups such as trucks where the standard notes that loading should allow stopping parallel to the kerb and an appropriate length for the likely design vehicle. Angle parking is almost never practicable given manoeuvre space requirements.

It is recommended that the parking standards in the Unitary Plan include a requirement with regard to protecting a pedestrian footpath from the overhang of a parked vehicle.

3.2 Austroads Guides

The set of Austroads Guides⁷ is made up of a series of documents and provides a comprehensive coverage of guidance for practitioners involved in traffic engineering, road design and road safety. The guides are well recognised in the New Zealand industry as a source of design guidance on various transport engineering matters such as intersection design, traffic impacts of developments, road safety, parking and access design. New Zealand practitioners have also contributed to the development of the most recent Austroads guides, with NZTA being involved in the development. Consequently the Austroads guides are applicable in the New Zealand scene, and have been adopted by NZTA as appropriate design guides

⁷ Austroads Guides. Austroads Incorporated, Sydney, 2008

It is also noted that the existing North Shore City District Plan states that, except as specified in Council standards, the specification and design of parking and loading spaces, is to be based on the Austroads Guide to Traffic Engineering Practice, Volume 11, Parking” (this guide has now been superseded)

A review of the following relevant Austroads Guides with regard to parking and access design has been undertaken.

- ◆ Guide to Traffic Management Part 11: Parking
- ◆ Guide to Road Design Part 3: Geometric Design
- ◆ Guide to Road Design Part 6B: Roadside Environment
- ◆ Guide to Road Design Part 4: Intersections and Crossings – General

A detailed review of these relevant guides has been undertaken, with the result presented in Appendix B.

3.2.1 Austroads Guide to Traffic Management Part 11: Parking

Part 11 Parking is concerned with the parking management process and provides guidance on how to supply parking in a safe and efficient manner, as well as access to and impact on the wider road network.

The relevant matters, with respect to the design of access, parking and loading areas, covered in Part 11 are:

- ◆ Parking and the environment (urban design considerations)
- ◆ Off-street parking – location of parking, layout, entrances, exits
- ◆ On-street parking – parking layout, provision of other road users including bicycles, motorcycles and people with disabilities
- ◆ Provides points to consider with regard to accesses/driveways eg. location, sufficient queuing areas etc
- ◆ States that a “comprehensive car park analysis” is required for parking areas and refers to AS/NZS 2890.1
- ◆ Internal clearances refer to AS/NZS 2890.1
- ◆ Markings should be in accordance with MOTSAM⁸
- ◆ Parking space dimensions, should be in accordance with AS/NZS 2890.1-2004 Part 1: Off street car parking
- ◆ Disabled parking spaces should be in accordance with AS/NZS 2890.6 (in preparation) and NZS 4121-2001.

The Part 11: Parking document provides guidance and recommendations, but generally does not provide specific details and often refers back to the relevant Australian/ New Zealand standard. For instance it states that parking areas require “comprehensive car park analysis” and refers to AS/NZS

⁸ Manual of Traffic Signs and Markings, NZTA, Aug 2010

2890.1 (Off-Street Parking) and outlines aspects to consider in design, eg. peak hour vehicle movements, pedestrian volumes etc. This guide relates principally to large off-street parking areas, as opposed to single residential sites for instance.

In addition to the points listed above, Part 11 also provides commentary on small car bays. This states that up to 2006 the trend was towards larger recreational vehicles and family sedans, but post-2006 the trend appears to have reversed in light of fuel pricing and environmental factors. Therefore the proportion of small vehicles is constantly changing and Austroads recommends adopting universally sized car bays unless there is strong justification to do otherwise. If required, small car bays should be used only in remnants of space and should not exceed 15% of total capacity. The bays should be the 'substandard' spaces and should be used by staff for example.

The on-street provisions provided in Part 11 are generally not relevant to the Unitary Plan.

It is recommended that for specific design standards that, if necessary, reference is made in the Unitary Plan to the relevant Australia/New Zealand standards, being NZS 4121: 2011 and AS/NZS 2890.1: 2004.

Austroads Guide Part 11 does however provide good guidance on parking design, and as such could also be referred to in the Unitary Plan if necessary although it is noted that the Austroads documents need to be purchased in order to view their content.

3.2.2 Austroads Guide to Road Design Part 3: Geometric Design

The Guide to Road Design Part 3 provides guidance on the geometric design of road alignment. It provides information on topics for geometric design such as operating speed, sight distance and design of on-road cyclist and parking facilities. The only relevant section to the design of access and parking/loading area is Section 4.10, On-Street Parking, which gives the following design guidance.

- ◆ The introduction of wheel stops to prevent angle parked vehicles intruding on narrow footpaths (less than 2m wide)
- ◆ Motorcycle spaces 1.2m min width and 2.5m min length
- ◆ Maximum crossfall of general footpath to be 2.5%, min width of 1.2m.

Given that this generally relates to on street parking it is assumed that the design of these will be the responsibility of Auckland Transport with design being done in accordance with the Code of Practice document currently being prepared.

One of the main strength of Part 3 with respect to access design is the guidance given on sight distances requirements. Sight distance is how far a road user (usually a vehicle driver) can see before their line of sight is blocked by either a change in the road geometry (for example a bend in the road) or an obstacle (for example landscaping). Insufficient sight distance can have implications for the safety or operations of an access or intersection

These are the most up-to-date sight distance requirements and provide a comprehensive set of tables and explanations as to the applicable sight distance necessary to achieve a safe environment. This

information is sorely lacking from many of the existing District Plans, although Waitakere has included significant sight distance guidance.

With respect to sight distance requirements it is recommended that this guide be specifically referenced in the Unitary Plan as it is the most up-to-date guidance on sight distance requirements. This could be used as a measure as to whether an access can be permitted or not. That is, if a driveway does not achieve the necessary sight distance requirements it becomes a restricted discretionary activity requiring further investigation or justification by a professional traffic engineer

3.2.3 Austroads Guide to Road Design Part 6B: Roadside Environment

Part 6B Roadside Environment provides guidance on the types of features and facilities that may need to be accommodated within a roadside. Section 4.4, Off-Street Parking, is the only relevant section with regard to standards relating to the design of accesses, parking and loading areas, and a full summary of this is included in Appendix B.

Part 6B provides general points for designers to consider but generally provides few if any specific requirements and refers to AS/NZS 2890.1 and other standards in relation to design matters regarding lighting, mobility impaired facilities, off-street commercial vehicle facilities, bicycle parking facilities and slip resistance for pedestrian surfaces.

It is considered that the information continued in this Austroads Guide is not relevant in the drafting of standards for access, parking and loading design in the Unitary Plan.

3.2.4 Austroads Part 4: Intersections and Crossings – General

Austroads Part 4 provides guidance on geometric design of at-grade intersections. The minimal information from this Guide that is relevant in the drafting of standards for access, parking and loading design for inclusion in the Unitary Plan is contained within Appendix B.

Part 4 defines ‘functional’ area, ‘left-turn conflict’ overlap and influence distance as well as considerable information presented in Appendix A of the Guide on the spacing assessments for intersections. This Guide also provides information on required driveway clearances to an intersection, which is useful information relating to the ‘defined road boundary’ assessment within the Unitary Plan.

It is considered that the information continued in this Austroads Guide is not entirely relevant in the drafting of standards for access, parking and loading design in the Unitary Plan. However there is some information on required driveway clearances to an intersection, albeit that this information is largely with respect to the design considerations to be taken into accounts for a property access onto an urban road. This is taken into consideration in Section 0.

3.2.5 Austroads Summary

It is considered that the Austroads Guides provide comprehensive guidance that a designer should consider with regard to off-street parking areas and access requirements. While the Guides generally refer to the relevant Australia and New Zealand Standard, they do provide good commentary and

reasoning behind some design aspects that can be included in the Unitary Plan. Accordingly it is recommended that reference to

- ◆ Part 3 (Guide to Road Design: Geometric Design) is necessary with respect to the sight distance criteria to be included in the Unitary Plan. Consideration will need to be given as to whether this is simply replicated within the District Plan (copyright issues?) or referenced only (requires the purchase of Part 3 in order to complete an assessment).
- ◆ Part 11 (Guide to Traffic Management) .could be included to give further guidance to the design of parking areas if necessary.

3.3 Auckland Transport Code of Practice

The Auckland Transport Code of Practice (ATCOP) is currently being drafted by Auckland Transport. The code of practice will consolidate the various engineering design standards and code of practices used by the previous Councils in the Auckland region and will provide information on various transport engineering design matters such as road design, drainage, lighting, public transport infrastructure, road hierarchy etc. It is understood that it is Auckland Transport's intention, that once completed this ATCOP document will be free to the community online.

There will be some overlap between the design standards given in the Unitary Plan and the Code of Practice and there should accordingly be a consistent approach between the two documents.

It is recommended that there needs to be consistency between the Unitary Plan and ATCOP standards with regard to vehicle access and parking/loading.design

3.4 International Examples

As part of this review process an investigation as to how Australian cities deal with access, parking and loading design standards within their District Plan equivalents has been undertaken. Specifically a review has been undertaken of the documents relating to the cities of Sydney, Melbourne, and Brisbane which all provide a slightly different approach. A full summary of the review is included in Appendix C with key points relating to alternative approaches to those contained in the existing Auckland District Plans have been summarised below.

3.4.1 Draft Sydney Development Control Plan 2010

Development Control Plans (DCP) are used for determining the requirements of access, parking and loading within Sydney. The former Sydney DCP was an extremely brief document that predominantly relied on references to various Australian standards within regard to access, parking and loading design. The draft Sydney DCP 2010 supplies slightly more information but again, when compared to the Auckland region's District Plans, can be regarded as a brief document.

The Sydney DCP is applied to a large, busy city centre and therefore has a pedestrian orientation. Notwithstanding this there are a number of points that are relevant in setting of design standards for access, parking and loading in the Unitary Plan, particularly focussing on the Auckland city centre.

Interesting points from City of Sydney Draft DCP (2010) are as follows.

- ◆ Vehicle access points are restricted in places of high pedestrian activity identified on the pedestrian priority map
- ◆ Vehicular access is to be designed to give priority to pedestrians and bikes by continuing the type of footpath material and grade
- ◆ Where possible adjoining developments should share/amalgamate vehicle entry/exit points
- ◆ Within the Central Sydney Planning Area, non residential car parking at ground level or above, as well as ramps, are not to be visible from the public domain
- ◆ Car parking areas “are to be subordinate in appearance to the main building”
- ◆ Ground level car parking is to be “designed with materials, details, proportions and landscaping to complement the building and adjoining buildings”
- ◆ Stacked parking means sharing a parking space vertically through use of a mechanical car stacker. Tandem parking means two or more vehicles sharing a parking space at the same level configured nose to tail. The stacked parking definition differs from that typically used in Auckland and clarification of a term for the use of mechanical car stacker, perhaps vertically stacked, should be used. The minimum length for a tandem space is given at 10.8 m.
- ◆ Further to the above the Sydney DCP states, where development includes a mechanical parking installation, such as car stackers, turntables, car lifts or another automated parking system, the development application is to include a Parking and Access Report.

The information contained in the draft City of Sydney DCP (2010) is focused on parking requirements for the inner city and as such there are certain aspects, as outlined in the bullet points above, which are relevant for consideration in the Unitary Plan, especially with regard to parking and access standards relating to the Auckland city centre.

3.4.2 City of Ryde, Sydney, Development Control Plan 2010

One section in the Development Control Plan for The City of Ryde sets out specific parking requirements. This is a very simple nine page document which predominantly outlines the number of parking spaces required and refers to AS 2890.1 (Off-Street Parking) and AS 2890.2 (off-street commercial parking) with regard to design matters of access, parking and loading. In addition to this there is a separate section on driveways which details technical material relating to the design of accesses.

It is recommended that the Unitary Plan provides more detail with regard to design standards for access, parking and loading than is contained within this Sydney DCP. The provision of the details and guidance in the Unitary Plan can simplify the process for applicants of smaller development proposals as sufficient information is given in the Unitary Plan without the need for the applicant to invest in the various standards.

3.4.3 City of Melbourne’s Planning Scheme

The City of Melbourne has Planning Schemes which are similar to District Plans in New Zealand. A review has been undertaken of the City of Melbourne’s Planning Scheme which is similar to Development Control Plans in Sydney. The Melbourne Planning Scheme, when compared to the

Auckland region's District Plans, contains relatively short sections on parking, loading and cycle requirements.

Separate sections of the Scheme are updated at different times, with the Parking Area section being updated in 2008 and the Loading and Cycling section both being updated in 2006. A full summary of the information contained in this document is provided in Appendix C.

The Scheme provides an outline of the 'purpose' of the parking section, which includes ensuring parking:

- ◆ Does not adversely affect the amenity of the locality, in particular the amenity of pedestrians and other road users.
- ◆ Achieves a high standard of urban design

Other points of interest with regard to the City of Melbourne's Planning Scheme include:

- ◆ No tracking curves are given, even though the design of parking areas of developments must consider type and size of vehicle likely to use the parking area.
- ◆ Dimensions for parking spaces vary between a width of 2.3 m and 3.2 m and a length of 4.9 m and 6.7 m. The design of parking and loading spaces must generally be in accordance with AS2890.1. But "a permit may be granted to vary any dimension or requirement
- ◆ With regard to the design of bicycle facilities, the Scheme refers to AS 2890.3 1993 for bicycle parking and to Austroads Part 14 – Bicycles.

There are certain aspects of this Scheme which are relevant to the Unitary Plan. Specifically the provision in the Scheme of outlining clearly the purpose or outcomes relating to the design of access, parking and loading areas is recommended for inclusion in the Unitary Plan.

3.4.4 Brisbane City Plan

The Brisbane City Plan provides a lengthier, more prescriptive document for the design of access, parking and loading than the above Sydney and Melbourne documents. The 52 page document provides similar information to that contained in the existing District Plans of the Auckland region, but with more detail. For instance the Brisbane City Plan provides a table of the required design vehicle for various types of land use developments. Three categories are given:

- ◆ "Occasional access" - Design vehicle swept path for occasional access does not have a greater overall width than the access driveway.
- ◆ "Major road" – required to enter and leave the site in a forward direction, be able to traverse the site and manoeuvre on-site into parking or loading areas
- ◆ "Minor road" - Where site access is via a minor road, on-site manoeuvring and full loading bay provision for the largest design vehicle is not essential. The vehicle can be contained within the site without blocking more than 50% of the parking spaces or occupying queuing areas, the swept path may cover the overall width of a two-way undivided driveway, reversing off the site to be in one movement only.

Figure 9 below shows an extract of this table, highlighting different land use activities on the left and the design vehicle requirements on the right.

Figure 9: Brisbane City Plan – Transport, Access, Parking and Servicing – Design Vehicle for Development Type (part of table only)

Column 1	Design vehicle (Refer Section 7, Table 19)		
	Column 2	Column 3	Column 4
Development type ⁽¹⁾	Occasional access	Regular access	
		Major road	Minor road
Caravan park	AV	RCV	MRV
Carpark	MRV	SRV	SRV
Cemetery	MRV	MRV	MRV
Child care facility	VAN	VAN	VAN
Community facilities	RCV	RCV	MRV
<i>Hall</i>			
<i>if music/concert</i>	RCV	RCV	LRV
<i>otherwise</i>	RCV	RCV	SRV
<i>Hospital</i>	RCV	RCV	LRV
<i>Youth club</i>	COACH	SRV	VAN
Display and sales activities	AV	AV	AV

The following points that are of interest in the development of the design standards for the Unitary Plan are:

- ◆ Various requirements are set out in the document eg gradients in easy to read tables. While the text refers to AS2890.1 a table is also provided with details of gradients for parking spaces, ramps, circulation roads, queue areas, and super-elevation on roadway camber
- ◆ Gradients, aisles, clearance, length and widths of parking spaces are all based on vehicle types (van, car, SRV, MRV, RCV, coach, AV)
- ◆ The number of loading bays required is also detailed in terms of design vehicles and development type and size
- ◆ Tracking curves for all vehicle types are provided within the Plan. Tracking curves for cars are further differentiated into small, medium or large car
- ◆ A large number of diagrams are provided including dimensions of curved ramps, end of aisle parking spaces, circulation roadway radii. Most of this information can be found in AS/NZS 2890.1 Off-Street Parking
- ◆ Typical layouts for parking areas are given eg small retail or industrial parking areas
- ◆ A minimum of 40% of the total site parking requirement, including all public and visitor parking “spaces, are to be clearly visible from the street”
- ◆ Shade trees to be provided for at-grade parking areas to achieve coverage within 10 years, with a desirable design principle of a ratio of 1 tree for every 6 car parking spaces

In summary the Brisbane City Plan appears to be overly prescriptive and provides a large amount of detail that is unlikely to be required for the Unitary Plan. Most of this information can be found in AS/NZS 2890.1 Off-Street Parking if required. Some of the information is also contradictory with the outcomes sought by Auckland Council in terms of urban design

3.5 Design Standards Within the Unitary Plan

3.5.1 Discussion

As discussed above there are a number of official standards with regard to the design of parking, loading and vehicle access. In addition to these standards, Auckland will also have an engineering code of practice which may include requirements for the design of access, parking and loading facilities. The question is whether these standards should be referred to in the Unitary Plan as the required standard to be met, or should the Unitary Plan be a standalone document, detailing its own design requirements, which may be based on a specific industry standard but will not include direct reference to the standard.

Clearly there are arguments for and against referencing a standard within the Unitary Plan to provide for a parking design rule. The current District Plans generally only refer to one external standard, which is the NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities. The North Shore City District Plan requires that the design of parking and loading spaces should be based on the Austroads Guide to Traffic Engineering Practice, Volume 11, Parking, except for matter covered by rules in the Plan. The other standard that might be expected to be referenced in the existing District Plans is AS/NZS 2890.1:2004 Off-Street Parking; however this is not so and instead the various Councils have adopted their own design requirements.

The general lack of references to other standards or guidelines may be as a result of the strict legal processes under the Resource Management Act (RMA, Schedule 1, Part 3) for incorporating reference to documents in the District Plan and hence into the Unitary Plan. It is understood that the proposed material to be referenced would have to be publicly notified in advance of its inclusion in the Unitary Plan, and allow the public to comment on the proposal to incorporate the proposed material by reference. Many of these standards also go into a level of detail that may be far too specific for most situations.

Further as standards are living documents which are periodically reviewed and new editions published, this will cause issues if they are to be referenced as a rule in the Unitary Plan as the document referenced then becomes a legally binding component of the Unitary Plan. This may also be an issue if certain aspects of a standard are adopted into the Unitary Plan. If the standard is updated, the Unitary Plan will need to be updated through a Plan Change process. If Auckland Council seek to update the rules within the Unitary Plan this may result in the need for the referenced standards to be removed and replaced. This is likely to result in time and cost implications for Council.

In addition the standards are comprehensive with regard to covering each respective topic and are logically laid out. However their comprehensive nature leads to a plethora of detail that is most likely not required by the vast majority of applicants. Therefore they could be considered not particularly user friendly.

However there are advantages in being able to reference standards and guidelines in the Unitary Plan as a rule for design matters as the Unitary Plan will then be very concise in nature. Further, these standards are well regarded within the industry and are in an internationally recognised form, being either an Australian and/or New Zealand recognised standard. The standards are available on-line through an Australian website and purchasing can be done relatively simple on-line at a cost of between approximately \$60 (general off-street parking) to \$110 (commercial off-street) per standard.

3.5.2 Summary

The points in favour of developing a rule which directly references standards for the design of access, parking and loading facilities in the Unitary Plan are:

- ◆ The standards are comprehensive with regard to each respective topic and are laid out logically. Many of the standards are already regularly used by professionals in New Zealand to design accesses, parking areas and loading facilities
- ◆ There are no issues with regard to relevance of the details, ie they are fit for purpose
- ◆ The resulting section on design requirements for access, parking and loading in the Unitary Plan can be kept short and concise

The points against developing a rule which directly references standards for the design of access, parking and loading facilities in the Unitary Plan are:

- ◆ The resulting document will not be particularly user friendly as it requires applicants and council officers to have an understanding of a very large amount of information contained in the various standards
- ◆ The standards must be purchased by applicants although to overcome this standards could be made available for general use at Council, e.g. at the public counter and at libraries. However, it is noted that there is a desire to make the Plan fully accessible without charge online
- ◆ There is a need to understand any potential copyright issues if figures or text is to be extracted, copied etc as part of an application or is to be included within the Unitary Plan
- ◆ The Unitary Plan will be bound by the particular version of the standard referred to in the Unitary Plan unless a Plan Change process is undertaken.

3.5.3 Conclusion

In assessing this matter it is noted that there is a difference between referring to a standard or code in a general way as a guidance document (and using it when assessing resource consent applications, eg. for subdivisions), versus including the standard or code as a rule and relying on it to determine the activity status of a proposed development

Accordingly it is recommended that a compromise position is considered for the Unitary Plan such that the Plan will contain standalone rules and regulations with regard to certain aspects of design relating to access, parking and loading facilities. This information should be sufficient to provide applicants with the appropriate design requirements so that when applied, the built outcome achieves the overall desired outcomes of the access, parking and loading standards of the Plan. Namely:

- ◆ The efficient and safe access for vehicles and pedestrians in and out of properties, including the safety of pedestrians on the footpath when in conflict with vehicles entering and leaving a property
- ◆ Well designed parking areas and parking buildings resulting in ease of use and safety for all types of users, including long stay, short stay, mobility impaired, cyclists and pedestrians.
- ◆ Well designed service areas, resulting in ease of the various types of users
- ◆ Well designed parking and loading areas, with good visual amenity through sleeving, planting and screening.

In addition to this it is also proposed that reference is made in the Unitary Plan to the various standards as a guide if more detailed design information is required. This means that the standards do not form a rule in the Unitary Plan but are given as a guidance document to applicants which can be referred to on more complex design issues, particularly where a resource consent is required.

With respect to the Auckland Transport Code of Practice (ATCOP) it is recommended that this is also referenced as a useful guideline document, although potentially not referencing individual design standards, but the Code of Practice as a whole. This may circumvent the issue in relation to a particular standard becoming out of date. If the ATCOP is referred to as a whole and is able to be obtained on Auckland Transport's website, then the Unitary Plan could simply direct users to this.

4 CONSULTATION

It is important to gain knowledge from those who have worked with these design matters on a regular basis. As such a workshop was held with relevant Auckland Council and Auckland Transport staff in order to gain their feedback on the new Unitary Plan process

The outcomes sought from the workshop included:

- ◆ To understand the issues with the existing design standards (access, parking and loading) and their application
- ◆ To identify measures that will provide better outcomes into the future
- ◆ To gain an understanding as to what Auckland Council and Auckland Transport anticipate from the new Unitary Plan.

The workshop participants undertook two workshop sessions, with the first session focussing on vehicle access and the second session on parking and loading design. The participants broke into focus groups following each session and provided verbal and written feedback on the issues. The participants were also encouraged to complete a feedback form and send it back to the project team. The feedback form asked the participants to respond to the following questions.

- ◆ What are the current issues with the existing District Plans standards and rules?
- ◆ What more do we need to consider for the new Unitary Plan?
- ◆ How do we make the new Unitary Plan clear and concise?

4.1 Summary of Workshop Feedback

All feedback received during the process has been included in Appendix D. This includes feedback taken at the workshop session, email correspondence with Auckland Council, and feedback forms submitted following the workshop.

The feedback from the workshops is somewhat “dis-jointed” as bullet points were jotted down by each group. In an attempt to categorise this information, similar comments received have been grouped into similar themes.

4.1.1 Parking and Loading

The areas generally covered by the workshop groups related to the relationship of the Unitary Plan and various design standards, general issues, landscaping and urban design, parking dimensions, disabled, loading, bicycle and motorcycle parking. Appendix D provides full details of the feedback from the workshop, with Table 4: below providing a summary of the key points.

The key issues on this topic raised included:

- ◆ There were a number of reasons raised against the use of referring to standards as a rule in the Unitary Plan versus providing a detailed stand alone design rule in the Unitary Plan.
- ◆ Urban design considerations is often in conflict with parking requirements
- ◆ User classifications for parking spaces should be used
- ◆ The use of parking dimensions and tracking curves are not always clear and understandable to all applicants
- ◆ Vehicle overhang from parking spaces and how this relates to the footpath width
- ◆ Motorcycle and bicycle parking should be considered and associated facilities in relation to different users
- ◆ Parking for mobility scooters with aging population.

Table 4: Parking and Loading Workshop Feedback Summary

Standards	<ul style="list-style-type: none"> ● Standards are not always fully understood by everyone who might be required to use them. ● Standards are also very detailed and any flexibility is lost with this prescriptive nature ● It is difficult for applicants to comply with standards that are not readily available ie. they have to be purchased. ● For small developments for limited parking this is difficult ● How often are standards updated? ● There is potential to be locked into an old approach that is not innovative by relying on standards ● If the UP is linked to some standards then Auckland Transport or Auckland Council needs to have some input into this if possible.
Issues	<ul style="list-style-type: none"> ● Outcomes can change – eg. safety, pedestrian amenity slower traffic environments

	<p>can have different standards. Therefore there needs to be clarity about outcomes</p> <ul style="list-style-type: none"> • How much discretion should be built into the UP? • Consider tradeoffs in special circumstances • Needs to be future proof. Parking technology eg stacking. • There is an overlap between District Plan and the Building Act • How do we bring existing parking areas up to standard • Lack of parking spaces provided forces developments in the outer area • Urban design vs carpark requirements • Parking rules may stop developments (eg. restaurant in small centre) • Requires objectives and policies to focus on pedestrian layout, safety etc • Could high occupancy parking be required in some circumstances? Eg. large employee requirements, malls, shopping centres, offices
<p>Landscaping / Urban Design</p>	<ul style="list-style-type: none"> • Pedestrian connectivity and pedestrian movement in parking area should be considered • The impact of vehicle overhang on the footpath width should be considered. • Integrate landscaping and parking areas to improve visual amenity. • Recognition of character and context e.g. town centres need different treatment than rural area • Difficult to say how prescriptive do we want to be • Low impact design should be considered.
<p>Parking Dimensions</p>	<ul style="list-style-type: none"> • Should provide for smaller cars • Differentiate between parking types eg. short term, employee etc • Lighting, CCTV, wardens should be considered • Not all users, including planners at council, always fully understand what is meant by various terms. Definition of terms needs to be clear, for example define aisle width. • Consider restrictions in length of accessways and no parking should be provided on major circulation routes • The user classification is appropriate in AS2890.1 (off street parking)
<p>Disabled</p>	<ul style="list-style-type: none"> • Auckland Transport provides some disabled parking on street. Businesses may not need specific onsite ones in those circumstances • Disability parks - blue surfacing of parks supported by disability groups. Urban design issue? • Location is important, accessibility to facilities is important • Should align with the Building Act?
<p>Loading</p>	<ul style="list-style-type: none"> • Issues with protecting streetscape • Loading on street can result in operational issues, but is sometimes allowed and not notified. There should be flexibility to allow this and balance against traffic concerns • AT could provide loading as public/shared space, ie amalgamating parking and loading for small business in one area. Currently there is a lack of flexibility and

	<p>opportunity for sharing</p> <ul style="list-style-type: none"> • Loading should be outcomes driven • Change through transition – within AS2890 is ok for cars but not for trucks
Bicycle and Motorcycle Parking	<ul style="list-style-type: none"> • Most groups thought this should be considered • May relate more to larger developments • Associated facilities in relation to different users • Opportunity to provide cycle parking instead of providing parking spaces for cars. • Dimensions for motorbike parking needed
Other	<ul style="list-style-type: none"> • Green building standards (NZ green building council) promotes smaller parking spaces • Need room for innovation, for instance valet services for parking results in less space required (eg Vodafone building CBD) • Parking for mobility scooters with aging population. Footpath parking for scooters and motorbikes in St Heliers for example.

There is a perception that the standards are difficult to understand and this may be the case for a large number of users. There was a feeling that the Unitary Plan should be more user friendly than the existing standards are. This may be achieved by providing simplified tables within the Plan. The tables can derive information from the relevant standards.

Overall there was a large amount of feedback on the urban design and landscaping matters. In particular, the vehicle overhang from parking spaces and how this relates to the footpath width (this relates to parking dimensions too) was raised. Specifically the comment is that if an overhang is allowed then the footpath width should be increased, while also considering the function of the footpath.

It was noted that low impact design should be considered. Low impact design relates to minimisation and mitigation of the effect of rain water run-off. With regard to transport this can include minimising driveway sizes and road widths, and ties in with urban design principles that are discussed throughout this report.

A couple of groups discussed providing for smaller cars in parking areas. This was thought to be a good idea for some developments, for instance the top floor of the Deloitte's building in the CBD where a full level of parking currently exists for a car fleet of smaller cars.

In a similar issue with regard to sustainability, it is understood that providing parking spaces that accommodate 90% or 99% of vehicles is somewhat in conflict with the green building standards which promote smaller parking areas. This was noted by two groups.

Discussion with regard to disabled parking requirements was limited but points included the mention of blue surfacing for disabled parking spaces and it is understood from the feedback that this is supported by disability groups. Further to this occasionally Auckland Transport provides disabled parking on street and in these cases it was suggested that no specific on site parking would be required, as long as there is an accessible route to the development.

Auckland Transport could also look to provide more loading as public/shared space, ie amalgamating parking and loading for small business in one area. On-street loading spaces in the city centre are not used much during the night. It was mentioned that there is a lack of flexibility and opportunity for sharing. Similar comments can be made about off street loading, which can be unsightly, and again not used after hours. However the issue with off street loading spaces is that they are on private land and may not provide the opportunity for shared use.

With regard to the requirement for bicycle and motorcycle parking, the comment was made that it is not enough to have the issue addressed as part of an integrated transport assessment done for a plan change or a resource consent application. If it is in the Unitary Plan as a requirement it has more weight when it comes to specific site or development applications.

4.1.2 Vehicle Access

The areas generally covered by the workshop groups related to width of accesses, the number of vehicle crossings, defined road boundary, gradients, the requirement for a level platform at the property boundary, and the access location. Appendix E provides a full summary of the feedback regarding vehicle access from the workshop with this summarised more concisely in Table 5: below.

The strong responses came in the following areas:

- ◆ The vehicle crossing needs to be fit for purpose
- ◆ Sharing driveways particularly for rear sites
- ◆ Footpath design critical, with pedestrian connectivity across large crossings
- ◆ Change wording/rule around defined road boundary.
- ◆ Very few comments in general regarding the defined road boundary.
- ◆ Providing two small vehicle crossings rather than one large crossing
- ◆ Gradients are not well explained and are important to consider in design

There were a number of topics that were flagged as issues to consider, and there were not always ready answers or recommendations to these.

Table 5: Vehicle Access Workshop Feedback Summary

Issues	<ul style="list-style-type: none"> • Overlap for subdivision and resource consent standards • Some plans have transport rules in various different sections within the district plan (eg. Rodney). This can be consolidated in the UP. • Conflict between where AT and AC powers begin and finish • Reversing out of sites and reversing on site. In particular child safety in residential driveways.
Width of Vehicles Access	<ul style="list-style-type: none"> • Must be fit for purpose • This includes pedestrians and the relevant vehicle tracking curve • Suggest a rule to implement pedestrian refuge if wide crossing required • Footpath design critical, with pedestrian connectivity across big crossing key • 9m for commercial is too wide

<p>Number of Vehicle Crossings</p>	<ul style="list-style-type: none"> • Promote shared access for multiple rear lots • Large (wide) driveways should be split into defined entry and exit with defined pedestrian refuge • Suggest number of crossings for commercial should be two small rather one large crossing • If site doesn't have parking, can't create parking and new vehicle crossing if heritage/character area (e.g. Herne Bay, Ponsonby, Parnell) • Removing redundant driveways should be a cost to the developer
<p>Defined Road Boundary</p>	<ul style="list-style-type: none"> • Very few comments regarding the defined road boundary • Change wording/rule around defined road boundary • Base on road hierarchy and type of intersection eg roundabout, signals etc • Should this be a prescriptive rule or just require engagement with AT on specific sites?
<p>Gradients of Vehicle Accesses</p>	<ul style="list-style-type: none"> • Important • Not well explained • Need to incorporate considerations of pedestrian user • Gradients need to be tied in with government standards. 1:5 is linked to handbrake strength NZCI (New Zealand Crash Investigators) crash report • Emergency vehicle requirements • How surfacing and gradients relate. Noted that the gradient is more important to get right.
<p>Level Platform at Property Boundary</p>	<ul style="list-style-type: none"> • Priority should be given to pedestrians (especially in the city centre) • Site specific and depends on pedestrian usage. • A speed bump has the same effect of slowing vehicles down and could be considered as an alternative
<p>Other</p>	<ul style="list-style-type: none"> • The consideration of passing bay locations was mentioned by a number of groups • Access restrictions for sites with high traffic generation. Should restrict quantity of activity rather than location of access. • Pedestrian path for rear sites over certain number of houses • Urban design and engineering conflicts need to be settled • There needs to be some flexibility to argue case

A few other more detailed comments are as follows:

- ◆ Footpath design critical, with pedestrian connectivity across big crossing key. It was suggested that there be a rule for the requirement of a pedestrian refuge if the crossing exceeds a certain width.
- ◆ Feedback suggested that the provision of an adequate surface (friction, grooved, sealed etc) for an access should be required on specific sites eg. in wooded areas or sites with gradient steeper than 1 in 4. It was also commented that the gradient is more important than surface treatment.

- ◆ One comment was made regarding the roles and requirements AT and AC. An issue may arise whereby AC will approve a new crossing and AT will not in fact allow it? Residential width of 2.75m is not ever seen. Typically 3.5m in/out and residential double garage of 5.5m. Smaller width works better. 5.5m is too wide. Suggest that 9m for commercial is too wide
- ◆ Level platform should be site specific and depends on pedestrian usage. It was commented that if it is required then it should be overdesigned, implying that a 6m platform is overdesigning in some cases. A level platform is similar to a transition. It is a section of an access close to the road reserve, where a vehicle can be accommodated for on a “level” gradient. That is, this section of the access is approximately 1 in 20 in grade and enables the vehicle to sit comfortably on, enabling adequate visibility of the footpath and well as reducing the need for any significant hill starts.
- ◆ "Clearance envelopes" for access should be included and tie back to residential rules about structures
- ◆ Access restrictions for sites with high traffic generation (e.g. Waitakere Plan >20 and >50 vehicles per day). Should restrict quantity of activity rather than location of access

4.2 Summary of Additional Feedback

Following the workshops, further discussions with Council Officers were undertaken. This included some one-on-one meetings, but was mainly a result of email correspondence outline further feedback.

4.2.1 Parking and Loading

Further feedback has been received regarding the use of standards and/or parking dimensions within the Unitary Plan. The following points were made:

- ◆ In Waitakere’s case most of the design requirements were in an external code of practice document. The biggest issue with this document was around the level of detail and ease of use. It was in some cases overly technical for assessing quite small scale development, and yet also provides inadequate details for complex parking structures.
- ◆ The ideal approach would be to have a relatively basic set of parking dimensions applicable to simple open air car parks of small size. Probably without the complexity of different sized spaces based on user classes. This would provide a simple easy to use option for small scale development. Dividing the allocation of spaces between user classes is probably not realistic for small developments.
- ◆ For larger and more complex developments where extensive car parking facilities will be provided and/or the parking will be incorporated into a structure (basements, undercrofts, multideck car parks) the use of a more complex design standard [AS/NZS 2890.1] that deals with the complexities of parking structures and/or optimises the land requirement for a large number of spaces becomes more justified.
- ◆ However it was questioned whether all dimensions within AS/NZS 2890.1 are satisfactory. For instance, the aisle widths it uses with 90 degree parking are very tight, although in some of the angle parking cases its aisle dimensions seem very generous compared to existing local standards

4.2.2 Child Safety in Driveways

Considerable feedback was received regarding child safety in residential driveways. It has been noted that New Zealand has a high rate of unintentional injury due to reversing vehicles in residential driveways.

The Unitary Plan has a part to play in terms of requiring safe design of driveways and manoeuvring areas. Although it is recognised that there are also other factors that influence child safety in driveways including vehicle design, driver behaviour and adult supervision.

Safekids, is a national child injury prevention service run out of Starship Hospital, which provides information on the cause and prevention of driveway injuries. The following information is from their website⁹ and the “Safekids New Zealand Position Paper: Driveway Run Over Injuries (2011)”:

- ◆ Of all child pedestrian injuries in the Auckland region, 25 percent occur on private driveways.
- ◆ It is estimated that every two weeks a child was hospitalised with serious injuries received from a vehicle driving on a private driveway in New Zealand (1998-2001 and 2001-2005). A further five children are killed in the same way.
- ◆ The driver is often an adult who is related, or known, to the child
- ◆ The incident typically occurs when a young child is driven over by a vehicle moving on private land (forwards and backwards)
- ◆ Drive-over injuries are known to occur in other places such as paddocks and car parks, but these are less frequent.
- ◆ There is a strong relationship between driveway injuries and age, with children injured in this way being most frequently between the ages of 0 to 4.
- ◆ The majority of the accidents (56%) occurred in South Auckland, followed by the West (18%), Central (14%), East (8%) and North (4%)

Identified as one of the three risk factors for child death and injury on private driveways property design (Built Environment) is a factor that the Unitary Plan can influence.

High levels of risk with regard to property design include:

- ◆ Driveways exiting onto quiet or less busy road (such as a cul-de-sac or local road)
- ◆ Properties with multiple parking spaces
- ◆ Shared driveways with more frequent car movements
- ◆ Driveway length greater than 12 metres
- ◆ No safe place for children to play

The following is taken from the Property Design section:

⁹ www.safekids.org.nz

A case control study by Shepherd et al investigated the built environmental factors (property design) involved in child driveway injuries. The paper also confirmed results from earlier studies that the risk of injury increased due to the design of the built environment (property design). It also suggested that modification of the built environment has the potential to reduce the rate of injuries

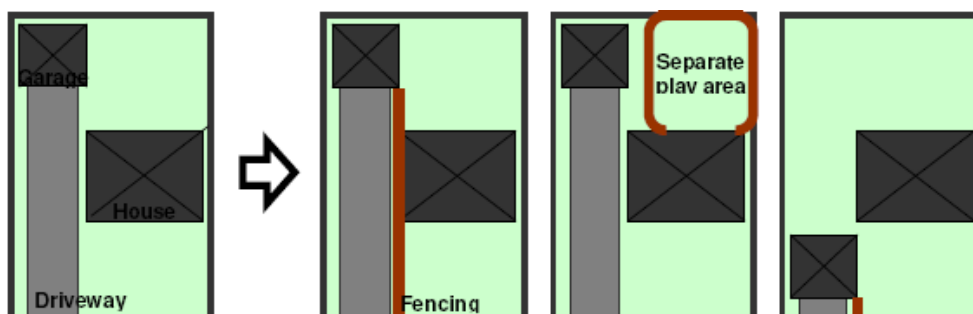
Further examination of these cases found that the only built environment intervention that resulted in a reduction in child driveway run over deaths and injuries was to separate pedestrian access from the property to footpath (path separate to the driveway).

The Shepherd et al study also noted that environmental factors are likely to be part of a more complex picture which includes driver characteristics, child supervision and vehicle characteristics:

- *Variations in the driveway design and surroundings are important.*
- *The type of road the property is on, driveway length, the amount and type of parking present, and the configuration of pedestrian and driveway spaces are associated with changes in the risk.*
- *This information should be used to modify existing and future residential environments in order to reduce the risk¹⁰.*

Figure 10 below shows possible property and driveway configurations and is taken directly from a Safekids Position Paper: "Child Driveway Run Over Injuries." (2011) .

Figure 10: Examples of possible property and driveway configurations, from undesirable to alternative, improved solutions shown left to right.



Accident Compensation Corporation has contracted Standards New Zealand to develop a handbook on safer house design. Safekids New Zealand is represented on the development committee. The handbook will replace the existing Standard, "Safer house design (Guidelines to reduce injury at home) NZS 4102:1996".

For instance the example given is, "vehicle garaging or parking spaces should be separated and fenced off from children's play spaces". This handbook will suggest best practice design solutions above the minimum requirements of legislation.

¹⁰ Shepherd M., et al., "Driveway runover, the influence of the built environment: A case control study." *Journal of Paediatrics and Child Health*. 2010, 46(12): pp. 760-7.

The following guidelines could be included in the Unitary Plan, and could be included as part of the assessment criteria where resource consent is required, e.g for residential unit developments or where standard access rules are not met.:

- ◆ Avoid long driveways where possible.
- ◆ Speed reduction - speed reduction mechanisms and warning signs built into longer driveways.
- ◆ Separation - greater care in the design, layout and fencing of driveways and/ or children's play areas (depending on site specific layouts) including:
 - Formalise driveway and parking areas on those properties currently utilising multiple areas for parking – reducing complex vehicle movement patterns.
 - Separate pedestrian access to the house from the street should be explored.
 - The erection of fences and gates to separate children's play areas from vehicle movement on site should be considered.
 - Prioritise site alterations for those properties where the driveways exit onto local roads and cul de sacs to reduce speed.

It is recommended that guidance is provided on safe property design; however, it may be that this information sits elsewhere in the Unitary Plan rather than with the standards for vehicle access and parking/loading design. This could be within the Built Environments section, or it could be that a brochure/leaflet is developed to be made available to the general public as a guidance document. As noted above, the most important aspect is to have separate pedestrian and vehicle accesses. Further investigation and research may be required for further requirements within the Unitary Plan.

It is also noted that Standards New Zealand is producing a hand out on safer housing design, based on information within the "Safekids New Zealand Position Paper: Driveway Run Over Injuries (2011)".

5 VEHICLE ACCESS

With regard to vehicle access there are a number of different design matters that appear in the various existing District Plans. As such, and for completeness, each matter has been addressed as a separate chapter heading below. Under each design matter the following information is provided:

- ◆ A brief description as to the need/ key outcomes relating to the design matter
- ◆ A discussion as to the effectiveness of existing District Plan's standards (taking into consideration the results of the consultation process)
- ◆ The recommended standard to be included in the Unitary Plan based on the outcomes of the best practice review, overseas examples and the consultation/workshops undertaken
- ◆ Commentary is also provided on additional matters that need to be considered, with these also forming part of the recommended standard
- ◆ Where applicable further work has been identified with respect to matters the Unitary Plan may need to consider in order to make the standard easily enforceable/workable

5.1 Vehicular Crossing Width

Discussion

The width of vehicle accesses need to be such to accommodate vehicles entering and exiting a site in a safe and efficient manner. The width of a vehicle access also impacts on the amenity and safety of pedestrians travelling along the footpath and as such there is a need to safeguard pedestrian movements, especially on streets with high pedestrian movements such as streets in key centres, key corridors and on streets providing access to high generating pedestrian activities, such as schools.

In determining the width of a vehicle crossing, consideration has to be given to what type of land use activity the vehicle access is serving, ranging from single residential dwellings through to large industrial sites. Consequently it is considered that any access standard needs to consider the type of land use being served by the vehicle access. The requirements relating to access width in the existing District Plans do make allowance for this, albeit it is considered the existing requirements within the District Plan can be simplified.

In addition it is recommended that pedestrian amenity needs to be identified as one of the considerations when determining the vehicle crossing design. It is also recognised that the Auckland Transport Code of Practice (ATCOP) is presently being developed, and it will be important that there is consistency between the Unitary Plan standards and vehicle crossing design guides contained in ATCOP.

Recommended Standard

The width of a vehicle crossing(s) must comply with Table 6, with the measurements illustrated in Figure 11.

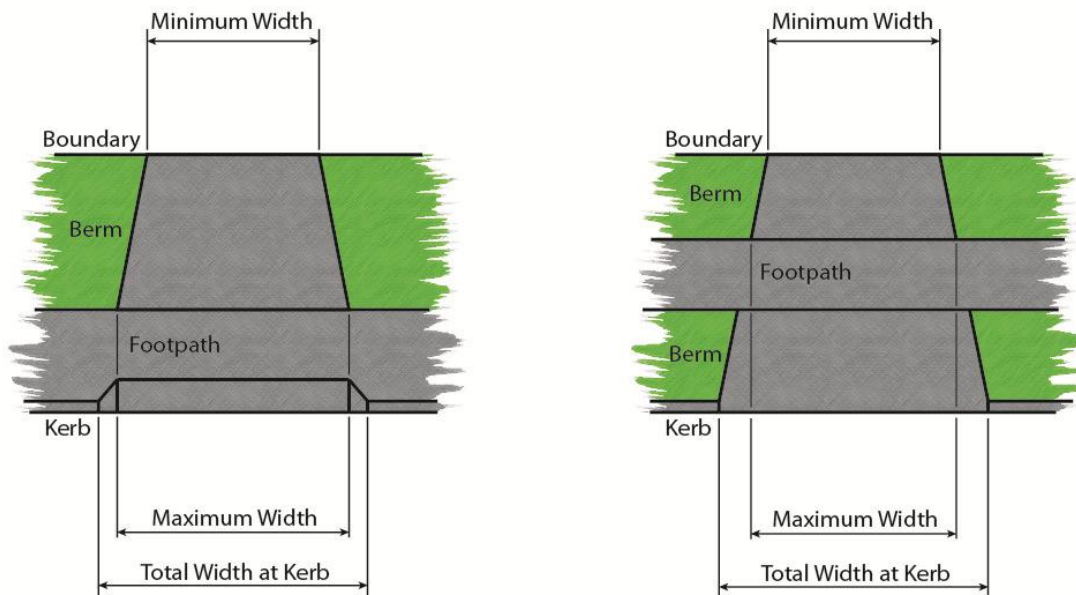
Table 6: Vehicular Crossing Widths

Land Use Activity	Minimum Width of crossing at boundary	Maximum Width – measured at rear of footpath or at boundary in the absence of footpath	Total Width at Kerb
Residential crossing serving 1 – 5 dwellings	2.5 m	4.5 m	5.7 m
Residential crossing serving greater than 5 dwellings	5 m	6.0 m	7.2 m
Non-residential activities	3.0 m (one way)	6.0 m ¹	7.2 m
	6.0 m (two way)	9.0 m ²	10.2 m
Crossings within city centre. town centres and on growth corridors	2.75 m	6.0 m	7.2 m

¹ The maximum width may be increased to 6.0 m where the crossing needs to accommodate the tracking path of large heavy vehicles. This will require resource consent as a restricted discretionary activity

² A maximum width of 9.0 m should only be applied where the crossing needs to accommodate the tracking path of large heavy vehicles

Figure 11: Vehicle Crossing – measurement locations



Vehicular crossings over a footpath must also comply with the following conditions

- vi. A vehicle crossing in the central area, town centre, growth area, on a key corridor or on a road serving land uses with high pedestrian activity shall be designed and constructed to retain the continuity of the footpath
- vii. A vehicle crossing shall be constructed in the same material and design as the surrounding footpath and the intersection of the vehicle crossing shall be graded to maintain a continuous footpath plane
- viii. Where a two way crossing exceeds 6.0 m in width at the property boundary, a pedestrian refuge shall be implemented within the access to reduce the effective width a pedestrian is required to cross, with a pedestrian required to cross no more than 6.0 m of a vehicle crossing before reaching a refuge or the opposite side of the vehicle crossing
- ix. Where access to and from a site is across a footpath in a town centre, on a growth corridor or on a road serving land uses with high pedestrian activity, adequate pedestrian sight splays from the vehicle crossing shall be provided. Adequate visibility to pedestrians from a vehicle access can be achieved through splays at the boundary, 2.5 m into the driveway and 2.0 m along the frontage footpath.

- x. A vehicle crossing shall be assessed against the relevant tracking curves applicable to the anticipated largest vehicle to use the access on a regular basis.

Applicants are advised that in addition to the provisions of the Unitary Plan there are also Standard Engineering Details related to the construction or alteration of a vehicle crossing. This information is contained in the Auckland Transport Code of Practice (ATCOP).

Matters of Discretion

The design and width of a vehicle access appropriate for a development depends on:

- ◆ The volume of traffic expected to use the access
- ◆ The pedestrian activity using the footpath
- ◆ The classification of the adjoining road both with regard to the amount of through traffic on the road and the pedestrian movement on the corridor
- ◆ The number of parking spaces served by the access
- ◆ The anticipated largest vehicle to use the access on a regular basis.

Further work required for inclusion within the Unitary Plan

Further work/consideration is required to determine streets/corridors with high pedestrian activity as this may be a subjective assessment unless otherwise stated.

5.2 Access Design

Discussion

There are a number of design related matters to consider under this topic including the width of an access, how many sites it may serve, any bends in the carriageway access to fire hydrants, the need for passing bays and vertical clearances. Vertical clearance matters are discussed in Section 6.6.

The majority of these matters are dealt with in the Auckland Isthmus District Plan, but are less common in the transportation sections of the other District Plans. In saying that, the Auckland Isthmus District Plan is quite confusing with respect to a number of these matters, particularly with respect to access to sites, and the number of sites served by an access. Given that this does not appear in the transportation sections of the other District Plans it is concluded that this aspect can be simplified if not removed. IN essence the design of an access needs to be able to accommodate the appropriate design vehicles.

Recommended Standard

Every parking and loading space shall have access from a road in accordance with the following standards:

- ◆ The minimum width of any access is 2.4 m
- ◆ All accesses and aisles, including any bends, are to be designed in accordance with the appropriate design vehicle necessary for the movement of vehicles to and from the road and

for the manoeuvring of vehicles within the site. In most instances this vehicle will be either a 99 percentile car, or a 99 percentile large truck.

- ◆ Access serving three or more loading spaces, or 10 or more parking spaces, shall be two lanes wide.
- ◆ No building or building platform served by the access is to be, in the case of a residential site, more than 135m from a fire hydrant and in the case of a business site, more than 90m from a fire hydrant
- ◆ Passing bays are required for any accessway within a site which is greater than 50 m in length, . Passing bays shall be provided at 50 m intervals, unless sight visibility constraints require them more often, and shall be designed to allow two vehicles to safely pass each other.

5.3 Number of Vehicle Crossings per Site

Discussion

The management of the number of vehicle crossings per site is important, as too many accesses can affect the operation and safety of through traffic on the road, can result in unsafe conditions for vehicles using the crossings and also affect pedestrian movement and safety on the adjoining footpaths. The existing District Plans are reasonably consistent in limiting the number of vehicle crossings to a single site to two vehicle crossings. In considering this matter further it is noted that there are a number of factors that need to be identified, including:

- ◆ The zone/land use activity being served by the crossing
- ◆ The length of the street frontage serving the site, with the longer the street frontage the less the effect of multiple crossing points

With respect to the street frontage this also links to another criterion identified in the Auckland Isthmus and Central Area Plans as to the maximum crossing width as a percentage of the site frontage. However, given that this is only identified in these two District Plans it is considered that this criterion is unnecessary.

Comments have been received as to the need to encourage the sharing of accesses where feasible. While we fully support this as an objective we note the difficulty in developing a rule to this effect, and suggest that this is more the role of an objective. We also consider that there may be some difficulty in “forcing” the use of shared accesses as this may require developers to enter into easement/financial agreements with another landowner, potentially making some development unfeasible. In our opinion the sharing of rights of way is something that needs to be implemented at the subdivision stage of development.

Recommended Standard

No more than two vehicle crossings shall be permitted in respect of any site.

Where access to and from a site is across a footpath in a town centre, local centre, growth area, on a key corridor or on a road serving land uses with high pedestrian activity no more than one vehicle crossing will be permitted in respect of any site.

Where additional crossings to a site may be required this will be subject to a resource consent, recommended to be considered as a restricted discretionary activity.

Further work required for inclusion within the Unitary Plan

Further work and consideration is required to determine where access to a site should be limited to only one vehicle crossing. At this stage we have highlighted town centres, local centres, growth areas and streets and corridors with high pedestrian activity. These may require further definition to avoid any subjectiveness as to what a growth area is and what constitutes high pedestrian activity.

5.4 Distance between Vehicle Crossings

Discussion

The distance/separation between vehicle crossings is identified in five of the nine District Plans with varying distances identified in each Plan. Whilst not directly stated, it can be intimated that the separation of vehicle crossings is aimed to:

- ◆ Ensure pedestrian safety
- ◆ Provide some physical separation between vehicle movements to ensure safe operation of the access

These two matters are both relevant criteria when assessing the operation of a vehicle crossing relative to the location of another vehicle crossing, however the variation in distances, as illustrated in the existing District Plans, suggests that there is no consensus as to what the minimum separation distance should be.

Given the variances in the District Plans we have derived the following recommendation on the minimum standards from each of the District Plans. Further, the minimum separation of 1.5 m is a sufficient width for a pedestrian to seek refuge within if both crossings are in use at the same time. We do note that this has been increased for the central area, due to the concentration of pedestrians within this area

Recommended Standard

The following minimum separation distances shall apply to vehicle crossings for the following activities:

- ◆ Non-residential activities: 2 m between vehicle crossings

The minimum separation distance is measured at the property boundary.

5.5 Gradient of Access

Discussion

The gradient of an access affects the operation and safety of the facility, especially where the access meets the footpath. The grade of an access can cause issues if due consideration is not given to stormwater runoff effects. With regard to the requirements of the existing District Plans there is general consistency in as such as different maximum grades are given for residential activities (regular users with relatively low usage) and other activities (causal users with a higher usage)

This is also somewhat consistent with gradient access recommendations found in industry standards and overseas examples. There is some variation as to what the maximum grade should be for residential activity, with the maximum grade for other land uses being consistent.

Recommended Standard

The maximum grade of an access shall be:

- ◆ For residential activities: 1 in 5 (20%)
- ◆ For all other activities: 1 in 8 (12.5%)
- ◆ Transitions (Figure 12), of a minimum 2.0 m in length, are required where a change in grade exceeds 1 in 8 (greater than a 12.5% change). The transition sections are required to avoid inadequate ground clearance.
- ◆ For curved ramps and driveways, the gradient is measured along the inside radius (Figure 13).
- ◆ The surface of any access and/or vehicle aisles necessary for the manoeuvring of vehicles within any non residential site shall not exceed a gradient of 1:8 in any part.

Figure 12: Ramp Transition diagram

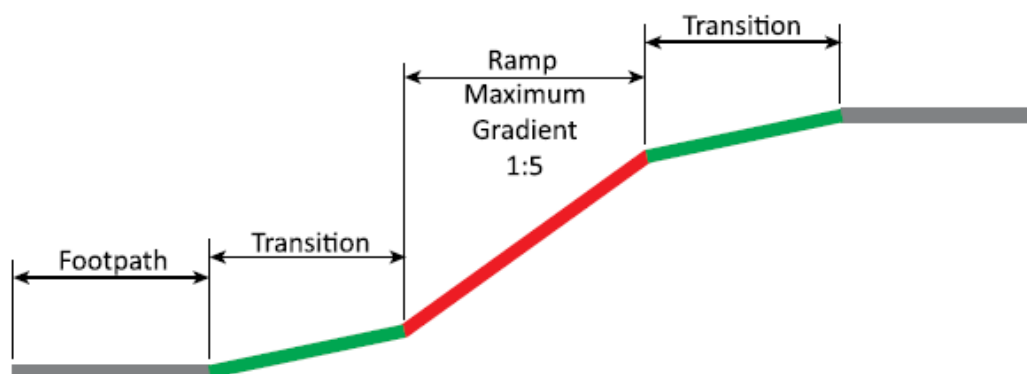
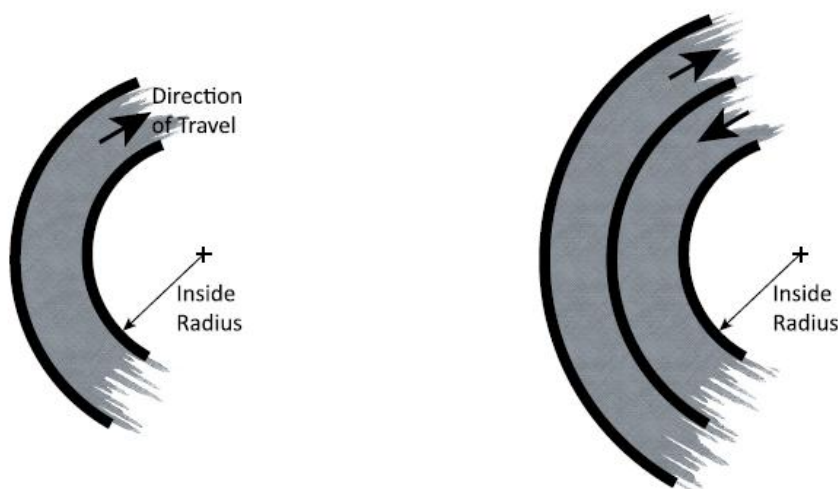


Figure 13: Curved Ramp diagram



For further information on this matter, guidance can be found in AS/NZS 2890.1:2004

Other Key Design Considerations:

If the vehicle access also serves as the sole pedestrian access to a building, consideration will need to be given to the applicability of NZS 4121.2001 for buildings with high public usage and housing for the aged.

Guidance on gradients of access can be sought from AS/NZS 2890.1:2004. Ground clearance templates are also provided within this standard and may prove useful in checking any complex transitions.

5.6 Access Level Platform at the Boundary

Discussion

The need to provide a level platform where an access meets a footpath is driven by the desire to provide a driver exiting a site sufficient space to stop, check and proceed safely with clear vision of the road reserve.

There is also an element of pedestrian amenity and safety within this standard, as the provision of a level platform prior to the access entering the road reserve allows adequate space and time for a driver to view and react to a pedestrian traversing across the access.

This level platform requirement is not addressed by all of the existing District Plans. However, given that one key outcome of the Unitary Plan is enhancing pedestrian amenity, it is recommended that the requirement for a level platform be included.

Recommended Standard

An access with a grade steeper than 1 in 20 prior to crossing the property boundary shall be provided with a platform not steeper than 1 in 20, located adjacent to the road boundary. The length of the platform shall be:

- ◆ For residential activities not less than 4.0 m in length
- ◆ For land zoned other than residential, not less than 6.0 m in length

Where the driveway gradient is steeper than 1 in 8, a transition section will be required to ensure adequate ground clearance.

5.7 Sight Distance at the Boundary

Discussion

Traffic movements to and from site entrances on frontage roads need to be accommodated in a safe and efficient manner. This entails providing safe site distances for drivers exiting a driveway.

Adequate sight distance is primarily required:

- ◆ For a vehicle emerging from a driveway to adequately judge an acceptable gap in the traffic.
- ◆ To ensure adequate visibility between vehicles leaving a driveway and pedestrians on the footpath.

On this matter there is no consistency within the existing District Plans. Four plans give specific requirements for sight distances between vehicles, with North Shore and Waitakere Plans being the most prescriptive. However the North Shore District Plan only refers to drive through facilities and the Waitakere Code of Practice provides visibility requirements at driveways in a relatively complex way.

Many of the existing District Plans do not provide minimum sight lines for pedestrian safety ie pedestrian splays. This may have been a previous oversight, or it may have been difficult to implement, particularly with respect to residential properties and the ability to fence/screen properties from the road.

This is an area that was raised a number of times within the consultation process undertaken and should be provided for within the Unitary Plan. The difficulty however is how prescriptive the pedestrian splays should be and whether they are feasible in a number of locations, particularly in existing developed areas such as Auckland's Central Area, particularly where development is required up to the boundary edge.

Given the lack of any "good examples" within the existing District Plans or within NZ publications we sought guidance from the Austroads publications. These provide the most "up to date" sight distance assessments, as well as being endorsed for use by New Zealand Transport Agency (NZTA).

Recommended Standard

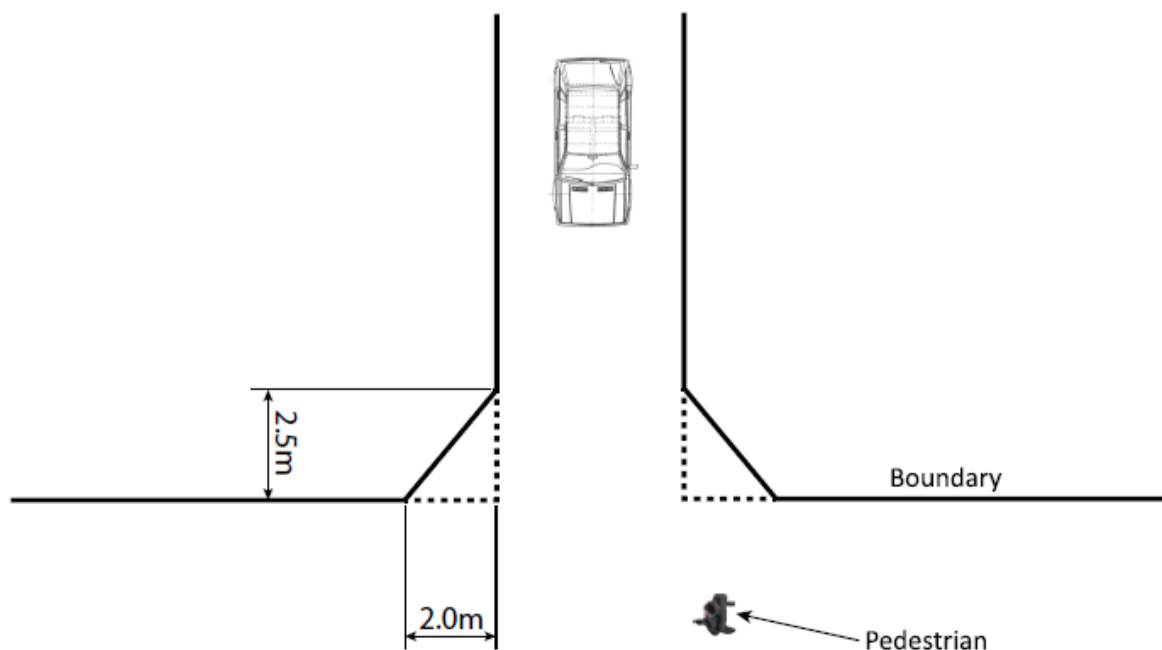
All vehicles accesses shall be located and constructed so that there is adequate sight distance to ensure the safe operation of the access. Adequate sight distance is primarily required:

- ◆ For a vehicle emerging from driveway to adequately judge an acceptable gap in the traffic
- ◆ To ensure adequate visibility between vehicles leaving a driveway and pedestrians on the footpath.

In determining the necessary sight distance requirements guidance shall be taken from the Austroads "Guide to Road Design" publication, and in particular "Part 3: Geometric Design"¹¹ As a minimum "Stopping Sight Distance" (SSD) shall be achieved at all vehicle accesses

All vehicle accesses shall be provided with the necessary pedestrian splays, illustrated in Figure 14, to allow exiting vehicles to observe pedestrian movements on the adjoining footpath and react accordingly. Adequate visibility to pedestrians from a vehicle access can be achieved through splays at the boundary, 2.5 m into the driveway and 2.0 m along the frontage footpath. Where adequate visibility cannot be achieved a 'car coming' signal triggered by a vehicle detector in the driveway, or other warning device, may be acceptable.

Figure 14: Minimum Sight Lines for Pedestrian Safety



Further work required for inclusion within the Unitary Plan

Consideration may need to be given as to how this may impact on residential properties and the likelihood of fencing and vegetation impeding a pedestrian splay. It may be desirable to "relax" this within residential areas, however areas about "high pedestrian activities" (eg schools) are exactly the areas where such a measure is necessary.

¹¹ "Guide to Road Design Part 3: Geometric Design", Austroads 2010, page 106

5.8 Access Restrictions

Discussion

Access restrictions seek to ensure that access to a site is appropriately located. Most District Plans provide some guidance on access restrictions, but the methods and distances for determining this is quite varied across each of the Plans. The over-riding restriction relates to ensuring the safety of the access and the operation of the surrounding road network is maintained. Consequently accesses near intersections are typically restricted to a certain distance from the intersection. The Auckland Isthmus District Plan also uses “Defined Road Boundary” criteria to restrict access locations.

Given the identified outcomes of ensuring efficient and safe access for vehicles and pedestrians in and out of properties, it is recommended that access restrictions, in the vicinity of intersections, are maintained within the Unitary Plan

In essence if an access is to be located within a “restricted” area then evidence needs to be provided to give Auckland Council/Auckland Transport confidence that an access within a “restricted” area is safe and efficient. This discretion is necessary and ensures the required scrutiny can be given to a proposal.

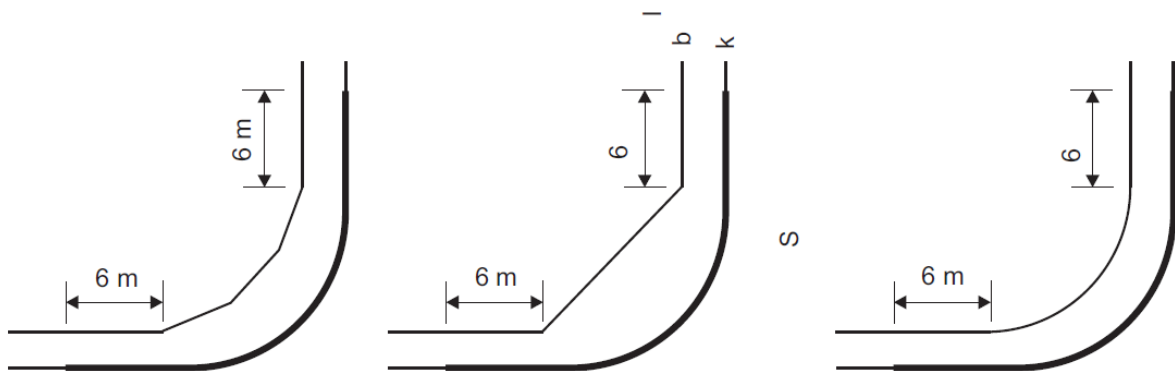
The following standard seeks to simplify the various requirements from each of the existing District Plans. It is recognised that many of the access restrictions are linked to the road hierarchy; hence the following recommended standard will need to be revisited once the Unitary Plan road hierarchy is determined.

Recommended Standards

Prohibited Access Locations

Vehicle crossings are prohibited from being located within those frontages of a property, at all intersections, as defined in Figure 15 below

Figure 15: Areas Prohibited for Vehicle Crossings¹²



¹² Manukau District Plan: Figure 8.3

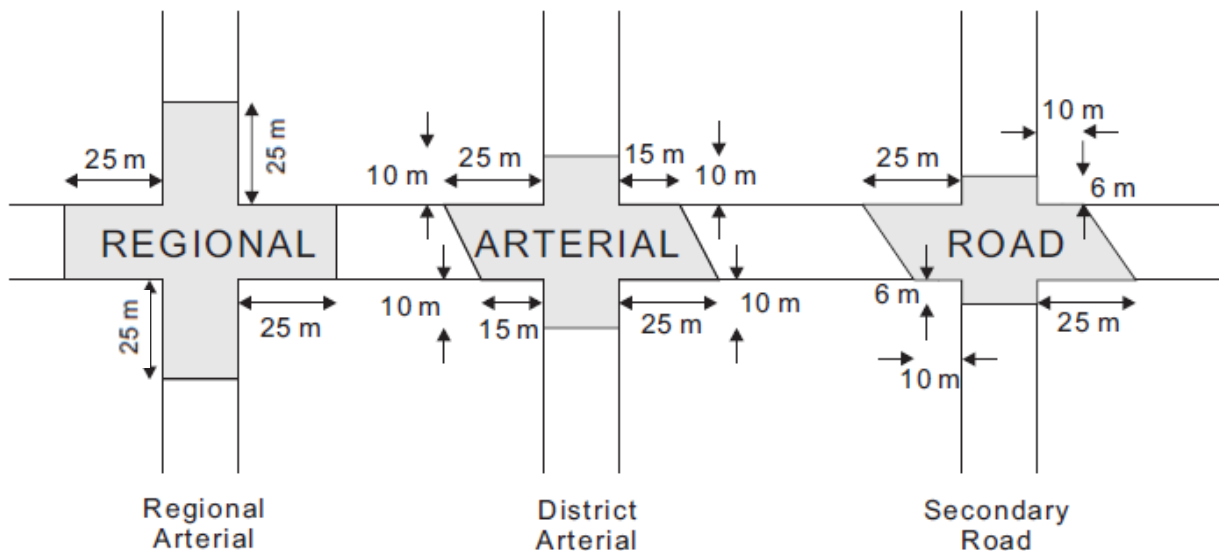
Where: S = road carriageway
K = kerb
b = property boundary
l = property

Defined Road Boundary

A vehicle crossing located within a Defined Road Boundary must be assessed as a restricted discretionary activity.

For the purpose of determining the extent of a Defined Road Boundary, Figure 16 illustrates the extent of a Defined Road Boundary for the relevant road hierarchy.

Figure 16: Extent of a Defined Road Boundary¹³



Motorway Interchange Controls

Where an access to a site abuts a Motorway Interchange Control Area shown on the Planning Maps, the use or development of that access shall be deemed to be a discretionary activity

Matters of Discretion for Access Restrictions

In assessing whether an exception to this standard is acceptable Council will have regard to the following matters:

- ◆ Whether adequate sight distance requirements are achieved
- ◆ Characteristics of the land use seeking access, as well as the characteristics of the frontage road
- ◆ Consideration of queue and turn lane lengths at signalised intersections

¹³ Manukau District Plan: Figure 8.4

- ◆ Location of existing services including bus stops, street furniture, landscaping, planting
- ◆ Pedestrian and cyclist requirements
- ◆ The availability of alternative access options and the practicability of implementing a complying design.
- ◆ Whether the access and egress arrangements will adversely affect the ability to access or egress neighbouring sites.
- ◆ Whether the capacity of the adjoining road network is sufficient to accommodate traffic generated by the activity.

Further work required for inclusion within the Unitary Plan

Access restrictions in the vicinity of intersections are typically linked to the road hierarchy of the intersecting roads. Given the variances across the existing District Plans with respect to hierarchy terminology this standard will need to be re-worded in line with the road hierarchy adopted by the Unitary Plan. The above diagrams will also need to be re-created based on the Unitary Plan road hierarchy

5.9 Pedestrian Access

Discussion

To date a requirement for pedestrian access has rarely featured in the existing District Plans if at all. This was a consistently raised topic at the workshops and is one of the key outcomes identified as part of the recommended standards being developed for the Unitary Plan.

The recommended standards for vehicle crossing and level platforms has sought to address this matter, however a further standard has been identified below

Recommend Standard

Where the vehicle access is the sole pedestrian access to a non-residential site the vehicle access shall not exceed a maximum grade of 1 in 12

Where a dedicated pedestrian access is provided to the site, the pedestrian access shall have a maximum grade of 1 in 12. The pedestrian access shall be located to ensure safe pedestrian movement to and from the site and take account of personal safety (Crime Prevention Through Environmental Design, CPTED)

5.10 Vehicle Crossing Formation

Discussion

This matter is reasonably consistent across the existing District Plan and ensures that the vehicle crossing is “fit for purpose”. One of the main matters seems to be ensuring that any dust nuisance is minimised as a result of a vehicle access being implemented.

It is assumed that rural driveways and their construction standards may be considered as part of any rural sections within the new Unitary Plan, particularly with respect to maintaining the rural character of an area. The construction standards are likely to be covered in the Auckland Transport Code of Practice. Access to recreational facilities may also be unsealed in certain areas of the region.

Consequently the following recommended standard is that for the “generic” situation.

Recommended Standard

All vehicle crossings are to be formed, drained and paved to a permanent dust free (not metal) surface. For unsealed roads where the access grade is not steeper than 1 in 8 up or down from the carriageway, crossings may be formed by using similar materials to that of the existing road surface or better.

The minimum construction standard of an access shall be that set out in the Auckland Transport Code of Practice.

5.11 Reinstatement

Discussion

There will be occasions, through site development, where existing vehicle crossings may become redundant. In these situations it is important that the footpath, berm, kerb and channel are properly reinstated

Recommended Standard

Where an existing vehicle crossing(s) is altered or no longer required the crossing shall be reinstated as berm and/or footpath and the kerbs replaced. The cost of such work shall be borne by the owner of the property formerly served by the crossing

5.12 Reverse Manoeuvring

Discussion

Reverse manoeuvring is dealt with in a variety of ways within the existing District Plans. For instance the North Shore District Plan determines the suitability of reverse manoeuvres based on the zoning of the land.

In order to prevent safety issues reverse manoeuvring from a site onto the road should generally be avoided. Vehicles should therefore enter and leave in a forward direction. The common exception to this relates to an access serving a single unit residential dwelling where reversing onto a Local Road is reasonably standard.

So while reverse manoeuvring should be restricted, the restriction should be limited to busy roads, such as regional, strategic or district arterials for cars, restricted on collector roads for trucks and where multiple parking spaces gain access onto a collector, local road or service lane. In addition to this, reverse manoeuvres shall be restricted on any road which experiences high volumes of pedestrians.

Recommended Standard

No reverse manoeuvre greater than 30 m shall be permitted.

Sufficient space shall be provided on the site so that no reverse manoeuvring onto or off a road is necessary for:

- ◆ All rear sites;
- ◆ Sites where four or more parking spaces on the site are served by one carriageway;
- ◆ Sites having access to roads classified as Strategic Routes, or Arterial Roads
- ◆ Sites where the crossing is or will be located within a Defined Road Boundary.
- ◆ Sites having access over a footpath with a high pedestrian activity.

Further work required for inclusion within the Unitary Plan

The restriction requirements with regard to reverse manoeuvres are typically linked to the road hierarchy from which the access is served. Given the variances across the existing District Plans with respect to hierarchy terminology this standard will need to be re-worded in line with the road hierarchy adopted by the Unitary Plan. In addition, as previously mentioned a definition for a high pedestrian activity needs to be verified.

6 PARKING AND LOADING DESIGN

The outcomes sought in developing standards for parking and loading design to be included in the Unitary Plan are as follows:

- ◆ Well designed parking areas and parking buildings resulting in ease of use and safety for all types of users, including long stay, short stay, mobility impaired, cyclists and pedestrians
- ◆ Well designed parking and loading areas, with good visual amenity through sleeving, planting and screening.
- ◆ Well designed service areas, resulting in ease for the various type of users

For completeness, each matter that is presently included in the various existing District Plans has been addressed as a separate chapter heading below. Under each design matter the following information is provided:

- ◆ A brief description as to the need/ key outcomes relating to the design matter
- ◆ A discussion as to the effectiveness of existing District Plan's standards (taking into consideration the results of the consultation process)
- ◆ The recommended standard to be included in the Unitary Plan based on the outcomes of the best practice review, overseas examples and the consultation/workshops undertaken
- ◆ Commentary on additional matters that need to be considered, with these also forming part of the recommended standard
- ◆ Where applicable further work has been identified with respect to matters the Unitary Plan may need to consider in order to make the standard easily enforceable/workable.

It is recognised that there is a general “shift” towards encouraging sharing, or providing shared parking facilities within developments to seek some synergies in the use of parking areas, as well as reducing the physical infrastructure required to support such parking areas. A shared parking area can reduce the number of vehicle crossings required to support it, as well as the possibility of providing less overall parking for each individual land use given the likelihood of multi-purpose trip making.

We agree with these aspirations and support such matters being identified as objectives within the new Unitary Plan. It is however difficult to draft a generic standard to give rise to such an objective. Consequently we have not sought to develop such a rule, recognising that it could form part of the assessment criteria for a development.

6.1 Parking Space and Manoeuvring Dimensions

Discussion

Parking space dimension requirements are currently provided within all the existing District Plans, with the requirements being of a similar nature. There is no direct reference in any of the District Plans to the New Zealand standard, AS/NZS 2890.1 Off-Street Car Parking, even though the document is widely used by architects and traffic engineers. All the parking requirements in the various District Plans differ in some way to AS/NZS 2890.1, usually with respect to the dimensional requirements.

Feedback received at the workshops did not indicate any significant flaws in the dimension standards provided within any of the District Plans or that excluding user classes leads to overly onerous parking dimensions. However it was noted that for some land use activities the minimum parking space width of 2.5 m contained in most of the District Plans can be regarded to be narrow.

The North Shore and Auckland District Plans include a parking width dimension of 2.3 m, with an associated large manoeuvring space, however the minimum width for parking spaces in the other district plans is 2.4 m. It is noted that the Auckland District Plan requires that parking space widths of 2.3 m should only be used where users are familiar with the parking area (regular users), and the parking is long-term. These stall widths do not meet the requirements of the Building Code. It is recommended that 2.3 m wide parking spaces only be used to accommodate small cars, as discussed in Section 6.20 below.

It was originally recommended that user classes be introduced into the Unitary Plan, giving the ability to differentiate the design of the parking area to the anticipated users, as is done within AS/NZS 2809.1. However, feedback received from Auckland Transport suggested that any differentiation in parking design added a level of complexity to the Unitary Plan that was unnecessary. There is also the issue of some confusion arising as to the user classes and who determines this – possibly ending up in a subjective argument.

Taking this feedback on board the following standard is based on the existing District Plans.

With regard to the extent of kerb overhang, all the existing District Plans permit a 1.0 m overhang, while AS/NZS 2809.1 allows only 0.6 m. A point that was raised at the workshop is the consideration of a requirement for wheel stops in parking spaces adjacent to footpaths in order to limit the encroachment of a vehicle overhang over the footpath.

Recommended Standard

Every car parking space, access and manoeuvring area shall comply with the dimensions given in Table 7 below and shall accommodate a 99 percentile car tracking template. These car templates are contained within the Unitary Plan. Figure 17 illustrates where the measurements are to be taken from

Table 7: Parking Space and Manoeuvring Dimensions

Parking Angle	Width of Parking Space (minimum)	Stall Depth		Manoeuvre Space	TOTAL DEPTH
		From wall ²	From kerb ³		
90°	2.5	5.0	4.0	7.9	12.9
	2.6			7.0	12
	2.7			6.7	11.7
60°	2.5	5.2	4.2	4.1	9.3
	2.6			3.5	8.7
	2.7			3.3	8.5
45°	2.5	5	4.2	2.6	7.6
	2.6			2.4	7.4
	2.7			2.4	7.4
0° (Parallel) ⁴	2.1	6.0		3.7	

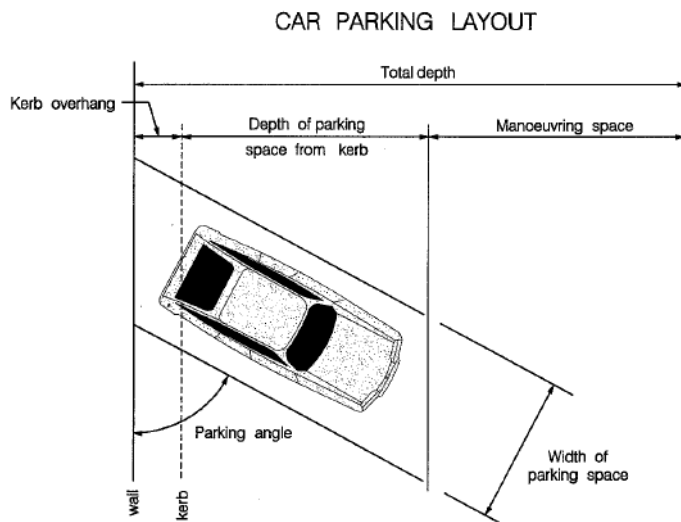
2 – Where parking is to a wall or high kerb not allowing overhang

3 - Kerb overhang – Where a vehicle may overhang the end of a parking space, e.g. at a kerb, provided the first 1.0 m immediately behind it is unobstructed, is not another parking space and is not required as a footpath or for some similar purpose

4 - Parallel Parking:

- ◆ Spaces shall be located 300 mm clear of obstructions higher than 150 mm such as walls, fences and columns
- ◆ The length of an end space where vehicles may enter or leave a space directly can be reduced to 5.4 m minimum
- ◆ Further guidance on parallel parking dimensions can be found in AS/NZS 2890.1:2004

Figure 17: Parking Space and Manoeuvring Dimensions:



Other Key Design Considerations:

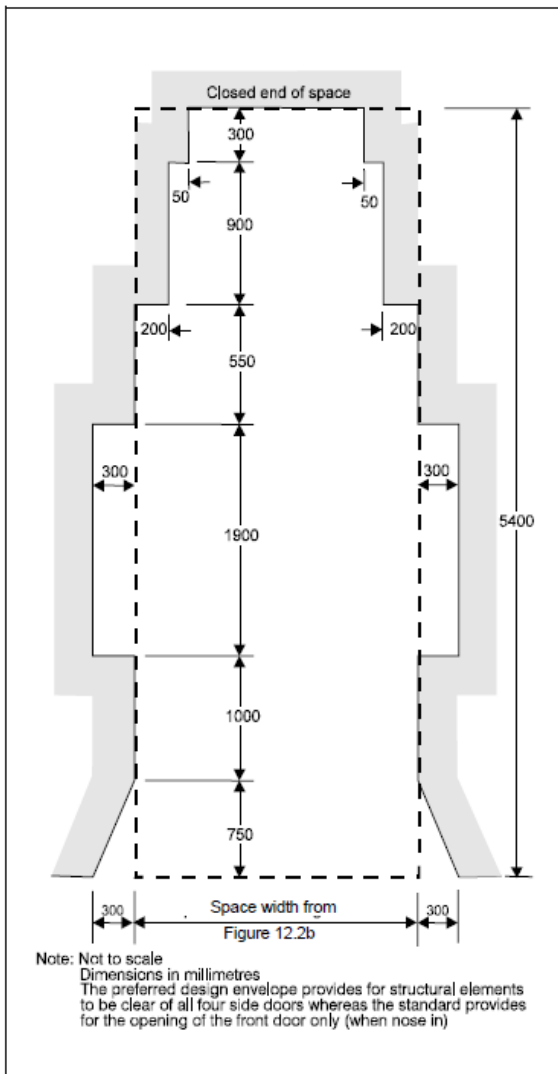
The surface of any required car parking spaces for public use shall not exceed a gradient of 1:20 in any part.

One way traffic is assumed for angle spaces.

Parking spaces adjacent to walls, fences or obstructions such as columns shall be made 0.3m wider to allow doors to open adequately.

Figure 18, being the Preferred Design Envelope, shall apply where a vehicle is parked alongside a column, wall or obstruction.

Figure 18: Preferred Design Envelope around parked vehicle to be kept clear of columns, walls and obstructions¹⁴



Blind aisles – a blind aisle is an aisle of parking that does not allow vehicle circulation and ends in an obstruction, requiring a vehicle to turn around and travel back in the direction it came from. These are permissible in parking areas so long as they are limited in length to the equivalent of six parking spaces (approximately 15 m). Parking spaces at the end of blind aisles shall be widened by at least 1.0 m to the dimension given in Table 4.

Further work required for inclusion within the Unitary Plan

A number of comments received throughout the process suggest that there is some confusion in applying the above standards. Whilst the above has been simplified to some extent, it is difficult to further articulate the required standard beyond that illustrated above. Consequently it is recommended that there may be a further advice note or for on-the-job training that can go into the use of the above standards in more detail, thereby familiarising the necessary staff with how to correctly apply the above.

¹⁴ Source of diagram is Auckland Isthmus District Plan. Diagram is the same as that contained within AS/NZS 2890.1:2004.

6.2 Disabled Parking Dimensions

Discussion

Under the Building Act 1991 there is an access requirement that applies to all new buildings and existing buildings, other than private residential buildings, when they are altered, or there is a change of use. The New Zealand standard, NZS 4121:2001 provides guidance on the design aspects of making buildings and facilities accessible to and fully usable by people who have disabilities, and provides the requirements for disabled parking and parking facilities.

Disabled parking spaces are provided for the exclusive use of vehicles displaying a current Operation Mobility Card, and are required to be provided in both public and private parking facilities and premises.

Parking for disabled users is considered in all the existing District Plans within the Auckland region. All but two of the District Plans refer to the NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities. The alternative to referring to this standard is to include dimensions for disabled parking spaces. This is the approach adopted by the Rodney District and Franklin District plans.

Recommended Standard

In accordance with the Building Act, car parking spaces for people with disabilities shall be provided in accordance with dimensions and ratios provided within NZS 4121:2001. There shall be vertical clearance of not less than 2.5 m along accessible routes in parking buildings and above parking spaces for people with disabilities.

Parking spaces for people with disabilities shall be provided with an accessible route to a building and shall be provided as close as practicable to the accessible entrance or to an accessible lift to the building or facility.

6.3 Garage Parking Dimensions

Discussion

Issues with vehicle access to and from residential garages have been identified as a significant concern by the central consenting team at Auckland Council. This has arisen through a lack of clear design guidelines within the existing District Plans. In discussions with Council officers it is understood that the matter arises through a misuse of the tracking curves as well as not correctly applying manoeuvre room requirements.

It is recognised that guidance to garage dimensions is provided in some of the District Plans, with Manukau and Papakura identifying the minimum internal dimensions for a garage. However the standard does refer to the width of the doorway being in accordance with the parking bay widths

City of Ryde DCP (Section 4.2.4) provides guidance on this, highlighting the link between the garage doorway and the provision of sufficient manoeuvring space in front of the garage to enable a straight entry.

Manukau and Papakura note the following:

The minimum internal dimensions for a garage to accommodate a 90 percentile motor car as defined by the New Zealand Transport Agency shall be 5.5m (length) by 3m (width). The width of the doorway of the garage shall be in accordance with the minimum stall widths specified in Figure 8.5. The minimum dimensions for a carport shall be 5m (length) by 3m (width).

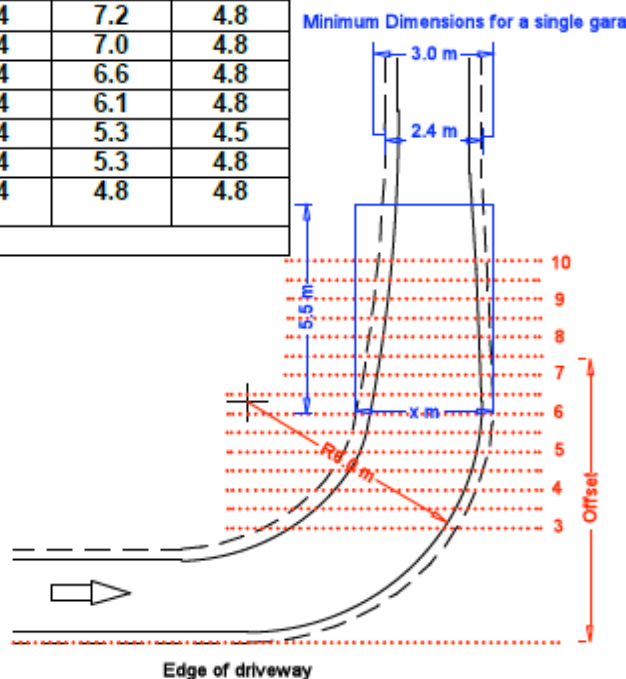
The City of Ryde DCP states¹⁵

Garage doorway shall have a minimum width of 2.5 metres. A wider doorway may be required if there is not sufficient manoeuvring space in front of the garage to enable a straight entry. Garage widths and turning paths are to comply with the table below

Figure 19: City of Ryde Example

TABLE FOR GARAGE OPENING WIDTHS TO COMPLY WITH AS 2890.1 Section 5.4

Offset from edge of driveway	Single Opening "x"		Double opening	
	Forward	Reverse	Forward	Reverse
	Entry	Entry	Entry	Entry
4.5	4.4	3.6	7.5	6.1
5.0	4.4	3.0	7.5	5.5
5.5	4.4	2.7	7.5	5.2
6.0	4.2	2.4	7.4	5.0
6.5	4.1	2.4	7.2	4.8
7.0	3.8	2.4	7.0	4.8
7.5	3.5	2.4	6.6	4.8
8.0	3.0	2.4	6.1	4.8
8.5	2.5	2.4	5.3	4.5
9.0	2.4	2.4	5.3	4.8
Straight Approach	2.4	2.4	4.8	4.8



¹⁵ City of Ryde "Development Control Plan 2010: Part 8.3 Driveways.

Further work required for inclusion within the Unitary Plan

It is recommended that this is given further consideration as it has been raised as an issue that is lacking direction within the current District Plans. Issues seem to relate to the design of garages being unable to support the tracking of vehicles to and/or from the garage particularly if there is already a vehicle parked within the garage, and the potential for a vehicle to strike a wall/column in trying to manoeuvre.

The standard as included in the City of Ryde DCP seems to address these matters in that it illustrates the need to widen a garage entrance the closer the entrance is to the vehicle manoeuvring area, as well as providing guidance on forward and reverse movements to and from single and double garages.

However there is a need to relate this to Auckland standards and hence it is recommended that a standard similar to that of the City of Ryde be established.

6.4 Loading Space Dimensions

Discussion

It is important to provide the most efficient use of space when allowing for service vehicles on sites. Providing too much space for vehicles is wasteful of land and does not provide a good urban design outcome, while too little space for vehicles can lead to multiple problems, for example vehicles are unable to use it and are forced to load/unload in a potentially dangerous location.

A loading space should accommodate the vehicle that is normally expected to use the site in order to control adverse effects that may result from loading within parking areas or on street. Further to this, in order to enable safe and efficient loading and unloading of goods the space provided should be located in a convenient location, in particular in close proximity to a service lift if applicable.

A loading space should generally be provided on site however where there is an accessible and adequate on-street loading space in close proximity, or there is the ability to create such a facility this could be provided in place of an on site space. It is acknowledged that providing on street loading can in some cases disrupt the safety, efficiency and amenity of roads however it is not always feasible to provide on site loading.

It was noted within the workshops that some sites have largely unused loading bays and sharing between sites can lead to a more efficient use of space, particularly if the loading spaces are on street (as was noted within the central area). Therefore if there is another site in the immediate vicinity that has available loading spaces which are not required at the same time as the proposed activity this should be considered.

Currently the dimensions of loading space requirements are detailed within all the District Plans, except the Franklin District Plan. The varied requirements for loading spaces are given in Appendix A and are summarised as follows:

- ◆ The length of the loading space is to be between 7.5 m to 12 m for a typical loading bay and 11m to 18 m for a bay that will accommodate an articulated vehicle.

- ◆ Typically the width required for loading spaces is 3.5 m, with the North Shore District Plan requiring 4.0 m in width.
- ◆ The required height above the loading space is between 3.5 m and 4.25 m.

It is recommended that the length of the required loading space should accommodate the maximum size truck that will normally service the development.

Within the Unitary Plan, the swept path template for a medium rigid truck (8 m in length) and a large rigid truck (11 m in length) should be provided (both 90 and 99 percentile). The 90 percentile swept path template to be used with regard to the loading space and the 99 percentile template to be used for the required access to and from the loading space.

Most typical developments, particularly office and retail, will only require servicing by a medium rigid truck which is the dimensions of a typical delivery truck or rubbish truck. For a development that requires a heavy vehicle larger than a medium or large rigid truck these developments should be guided by tracking curves within RTS18¹⁶

With regard to the maximum height of a loading space, 4.25m is believed to be excessive and represents the maximum height of any vehicle on the road (RTS 18). It is accordingly recommended that a minimum height of 3.8 m is specified in the Unitary Plan. This is taken from the TNZ RR32¹⁷ and represents a height that will accommodate a 90 percentile single unit truck (excluding stock and high sided trucks). 3.8 m is also the maximum height specified within the existing District Plans with the exception of the North Shore Plan

The minimum width within AS 2890.2:2002 (Off-street commercial vehicle facilities) for all vehicles is 3.5 m and therefore it is recommended that this is adopted.

On-site manoeuvring is also required to avoid reverse manoeuvring off or onto the road where the road is a regional and district arterial or a collector road.

Recommended Standard

Loading spaces shall accommodate a minimum of a 90 percentile truck medium rigid and circulation aisles shall accommodate a 99 percentile truck medium rigid. The turning templates for these vehicles are contained within the Unitary Plan. Notwithstanding this provision should be made for the largest vehicle that will normally access the site. This may be larger than a medium rigid truck.

A loading space designed in accordance with the following will be deemed to comply with this standard

- ◆ The design of each loading space shall ensure that it is fit for purpose, conveniently located and shall be of the following dimensions:

¹⁶ ¹⁶ "New Zealand on-road tracking curves for heavy motor vehicles" (August 2007).

¹⁷ Site Design for Heavy Vehicle Facilities, Transit New Zealand Research Report 32 (1994)

- For freight depots, carriers' depots, warehouses, manufacturing premises, bulk stores, truck terminals and other similar land use activities, a typical large rigid truck shall be accommodated within the loading space, which shall be 11 m in length
- For retail premises, non-permanent accommodation, offices a minimum of 8.0 m in length to accommodate a medium rigid truck
- Offices and other non-goods handling activities, where the gross floor area is not greater than 1,500 m², consideration to be given to the availability to use on street loading spaces or off street parking spaces
- Medium to high density residential developments, consideration to be given to the availability to use on street loading spaces or off street parking spaces
- ◆ Where articulated vehicles are to access a site, a loading space or docking bay of at least 18.0 m in length shall be provided¹⁸.
- ◆ No loading space for a truck shall be less than 3.5 m in width
- ◆ Part of any yard of a site may be used to provide a loading space for any site provided that the loading space and method of loading shall at no time: (i) cause the footpath or access to the rear of the site or access to an adjacent property to be blocked; or (ii) create a traffic hazard on the road.

In addition it must be ensured that:

- ◆ All vehicle manoeuvring can be carried out within the site. Sufficient space shall be provided on the site so that there is no reverse manoeuvring onto or off a road from any loading space where the road is a Regional or District Arterial, or where the footpath on the adjacent road experiences a high level of pedestrian activity
- ◆ Loading spaces shall be clearly marked and identified with adequate access to and from the road
- ◆ Loading spaces shall be screened from adjacent sites when adjacent to residential zones
- ◆ Where large waste collection vehicles (front-lift compaction) are anticipated on site these vehicles should be accommodated and loading or unloading refuse shall take place entirely on site.

6.5 Restrictions on Parking Location

Discussion

There are a number of matters within the existing District Plans that place restrictions on the ability to park vehicles within a site. Of relevance are building line restrictions and the use of yards for parking and/or loading. By in large, any parking or loading provided in these areas is discouraged

¹⁸ Auckland Central Area District Plan specifies a length of only 11m for an articulated truck despite the standard length measuring 17.9m (RTS18)

Given the importance of safeguarding a building line designation it is recommended that the existing Auckland Isthmus District Plan is taken forward into the Unitary Plan. This then allows further scrutiny of an application if it seeks resource consent and proposes parking within the building line designation

Recommended Standard

The use of yard space for parking and loading

The parking requirement in respect of any site in any zone may be satisfied by the use of part of any yard of that site provided that the part so used shall not:

- ◆ impede vehicular access and movement on the site;
- ◆ infringe any open space provided to meet the minimum private open space requirement for each unit in a multiple household unit development;
- ◆ infringe any landscaping provision required by the landscape design

Part of any yard of a site may be used to provide a loading space for any site provided that the loading space and method of loading shall at no time:

- ◆ cause the footpath or access to the rear of the site or access to an adjacent property to be blocked; or
- ◆ create a traffic hazard on the road

Building Line Designations

No required parking or loading spaces, manoeuvring area, or part thereof shall be located between any building line restriction and the road alignment shown on the relevant Planning Map

6.6 Vertical Clearance

Discussion

The vertical clearance or headroom required within parking areas is critical to prevent damage to buildings and vehicles. The clearance depends on the type of vehicle that is predicted to use the parking and/or loading area.

There have been some misunderstandings in the industry as to how the vertical clearance should be applied with respect to NZS 4121.2001 and the accessible route to a disabled parking space. The confusion arises as to the requirement of NZS 4121.2001 to provide 2.5 m headroom along the entire accessible route from the entry of the disabled parking area to the parking space, and including above the parking space. It is often argued that the 2.5 m headroom is only required above the parking space itself, as this is the height requirement for the operation of a wheelchair hoist mounted on the roof of a car. While this argument has been successfully implemented in a number of locations, there would appear to be no formal evidence as to the height of a disabled vehicle plus wheelchair as it traverses through a parking building.

Consequently we have recommended standards that are consistent with the existing District Plans, New Zealand Standards and the Building Code

Recommended Standard

The minimum overhead clearances to ensure design vehicles can pass safely under overhead structures are as follows:

- ◆ Cars: Absolute minimum 2.1 m
- ◆ Cars where access and parking is required for disability-vehicles: 2.5 m.
- ◆ Vans: 2.5 m
- ◆ Medium-rigid-trucks: 3.8 m

Other Key Design Considerations:

Appropriate warning devices such as a flexible striker bar shall be provided in conjunction with signage wherever the clearance is less than 2.3 m.

Clearances shall be measured to the lowest projection from the roof, eg. fire sprinkler, lighting fixture, sign.

Where a change of gradient greater than 0.1 m occurs, attention must be given to the available headroom.

6.7 Tracking

Discussion

Providing a parking and loading area that easily accommodates car and trucks is a key outcome of development design. Access, parking and loading areas should be designed with the appropriate tracking curve for the vehicle that will typically use the development.

The tracking curve requirement for parking and access of cars associated with car movement is:

- ◆ With regard to circulation, a 99 percentile car should be accommodated
- ◆ With regard to parking spaces, a 90 percentile for regular users and 99 percentile for casual users should be accommodated

Loading spaces shall be able to accommodate a minimum of a 90 percentile truck medium rigid and circulation aisles shall accommodate a 99 percentile truck medium rigid.

Feedback from the workshop highlighted a number of issues with the use of tracking curves, with the general feeling that these are being mis-used in a number of instances. Examples were given where residential garaging has been approved with what was thought to be appropriate tracking assessments, only to find in practice the site is unworkable. This issue seems to have come about through a lack of understanding as to how to apply the tracking curves, as well as a lack of understanding as to the vehicle clearance requirements. Feedback was also received as to the lack of “reverse manoeuvre” templates, with this being an everyday occurrence for many residential properties. Again, the existing tracking curves are being mis-used to try and replicate reverse manoeuvres, and this has caused issues. To this end, explanations of the use of tracking curves have been derived in the recommended standard. We have not sought to provide reverse manoeuvre

templates within the Unitary Plan as we believe these are also likely to be open to misinterpretation and cause further confusion. To provide some clarity a statement within the recommended standard is to be included noting that the tracking curves are for the forward direction only.

An issue was also identified whereby the photocopying of the tracking curves from the District Plan can lead to the scale becoming distorted as a photocopy can, if care is not taken; reduce the scale of a drawing. Consequently it may be beneficial for tracking curve diagrams to be maintained on a Council website to be downloaded and printed at the appropriate scale.

Further to this explanation it is recommended that the following tracking curves are included within the Unitary Plan. These should be based on those contained within RTS18¹⁹:

- ◆ 90% and 99% car
- ◆ 90% and 99% medium rigid truck (8 m)
- ◆ 90% and 99% large rigid truck (11.5 m)
- ◆ Semi-trailer (17.9 m)
- ◆ Tour coach (12.6 m)

Additional clearances should be added to each side of the tracking curves above to allow for driver variations due to unfamiliarity, steering errors, differences between the design vehicle and an actual vehicle and any potential out-swing of the front or rear of a trailer as it enters or leaves a turn. The recommended minimum clearance to be added to each side of the tracking curve is

- ◆ 300 mm minimum on each side of the vehicle for manoeuvring (speeds generally less than 10 km/h)
- ◆ 500 mm minimum on each side of the vehicle for circulation (speeds generally greater than 10 km/h)

All tracking curves to be included within the Unitary Plan should illustrate a clearance of 300 mm about the vehicle, given that the use of tracking curves is predominately for car parking areas, vehicle speeds are likely to be less than 10km/h. Whilst not all of the above vehicle types are included in each of the existing District Plans, it is recommended that they are all included in the Unitary Plan.

Recommended Standard

Every vehicle access, parking and loading area shall be assessed with respect to ingress and egress of vehicles to and from the road, and for the manoeuvring of vehicles within the site.

In determining the extent of area required for manoeuvring space, the Council will be guided by the tracking curve diagrams contained within the Unitary Plan.

In applying the tracking curves:

- ◆ These tracking curves are intended for the use in the preparation of internal site designs.
- ◆ For public and customer parking, the 99 percentile car tracking curves shall apply

¹⁹ "New Zealand on-road tracking curves for heavy motor vehicles" (August 2007)

- ◆ The clearances identified about each vehicle shall be maintained between the vehicle tracking area curve and any fixed object. That is ;
 - 300 mm minimum on each side of the vehicle for manoeuvring (speeds generally less than 10 km/h)
 - 500 mm minimum on each side of the vehicle for circulation (speeds generally greater than 10km/h)
- ◆ The tracking curves provided are only suitable for vehicles manoeuvring in a forward gear and do not represent vehicles reversing
- ◆ Care must be taken in applying the tracking curves, ensuring the vehicle can logically traverse the site as required to meet the tracking movement.
- ◆ Care must also be taken in reproducing or scaling tracking curves, with the horizontal and vertical axes checked to ensure their accuracy following their reproduction

In situations where complex manoeuvres are required the Applicant is to engage the services of an experienced professional in order to verify the suitability of the site manoeuvring.

Further work required for inclusion within the Unitary Plan

Tracking curve diagrams will need to be developed that illustrate the minimum clearance about the vehicle as the existing District Plan tracking curves all differ in this respect. It is recommended for the sake of consistency that the Unitary Plan tracking curves for the larger vehicles should be based on those contained within RTS18²⁰: This will require consultation with NZTA in order to ascertain the ability for these to be included in the Unitary Plan. A 90% and 99% car tracking curve will need to be developed as this is not included in RTS 18.

It may also be beneficial for tracking curve diagrams to be maintained on a Council website in order for these to be downloaded and printed at the appropriate scale.

A number of comments received throughout the process suggest that there is some confusion in applying tracking curves. Again, it is recommended that there may be a further advice note or for on-the-job training that can go into the use of the above standards in more detail, thereby familiarising the necessary staff with how to correctly apply them.

6.8 Gradients in Parking Areas

Discussion

The gradient within parking and manoeuvring areas is an important design consideration as it influences whether an area will drain adequately (minimum gradient) and whether an area is user friendly for pedestrians and disabled users (maximum gradient). It is an area that received almost no feedback either written or from the workshops.

²⁰ "New Zealand on-road tracking curves for heavy motor vehicles" (August 2007)

Most of the existing District Plans provide detail with regard to gradients within parking and service areas. Those plans not listed have no provision. By way of summary:

- ◆ North Shore - 1 in 15 (6.6%) for residential parking areas, 1 in 20 (5%) for public parking areas
- ◆ Waitakere – 1 in 16.5 approx (6%) for parking areas, heavy vehicle parking or loading 1 in 33 approx (3%), with a minimum of 2% for a concrete surface or 3% for a bitumen surface where surface drainage is necessary.
- ◆ Rodney – 1 in 8 (12.5%) maximum at any point in parking area (except for housing units)
- ◆ Auckland (Central and Isthmus) – 1 in 16 (6.25%) transversely and 1 in 20 (5%) longitudinally along the direction of the space, with a gradient of 1 in 12.5 (8%) on steep sites being acceptable for manoeuvring areas. For service and manoeuvring areas, a gradient of 1 in 12.5 (8%).

The Auckland Isthmus District Plan has the same requirements as AS/NZS 2890.1:2004 (excluding manoeuvring area grades) with the transverse, longitudinal and manoeuvring grades specified. In contrast the Rodney District Plan gives only one maximum required gradient, whilst the North Shore District Plan identifies gradients for residential use and public use. This approach could simplify the detail within the Unitary Plan but will be overly conservative for many cases if only one grade is detailed. It is recommended that the gradients within AS/NZS 2890.1:2004 are taken as the standard within the Unitary Plan. Further to this it is noted that the Austroads guidelines also refer to the off street parking standard.

In addition to the gradient for general parking spaces the maximum gradient for disabled parking spaces should be detailed. This is something that is not detailed in the existing District Plans. The maximum gradient is shown to be 1 in 50 (2%) within NZS 4121:2001.

Recommended Standard

The maximum gradient for a parking space to be used by the public shall be as follows:

- ◆ Measured parallel to the angle of parking – 1 in 20 (5%)
- ◆ Measured in any other direction 1 in 16 (6.25%)
- ◆ Within a disabled parking space, and measured in any direction, 1 in 50 (2%)

The minimum gradient, so that parking areas will drain adequately, shall be 1 in 100 (1%) for outdoor areas and 1 in 200 (0.5%) for covered areas.

The maximum gradient for a manoeuvre area shall not exceed 1 in 12.5 (8%)

6.9 Pedestrian Movement

Discussion

The matter of pedestrian movement through parking areas is not dealt with in the existing District Plans. The following recommended standard seeks to bring the need to provide for pedestrian movement to the forefront of the design process. Much of the design related information has been gleaned from the Australian examples, given the lack of this type of information within the existing District Plans.

In developing the standard below it is suggested that this information may be better located under a standard that deals with “parking area” design. This could also include the information in relation to lighting, screening and landscaping, giving a complete “section” on what matters should be taken into account in the design of large parking areas.

Recommended Standard

The design principles for a parking layout, with respect to pedestrian movement are:

- ◆ Provide sight distances appropriate for the likely operating speed in all parking areas addressing potential pedestrian /vehicle conflict. This will often require splayed corners on structures and careful treatment of landscaping and sign placement in areas of potential conflict
- ◆ Ensure no reversing of vehicles, particularly service vehicles, in areas of high pedestrian activity
- ◆ Provide measures to enhance the security of people using the parking area

All parking areas shall provide a clearly defined pedestrian path/network that:

- ◆ Closely follows pedestrian desire lines linking the pedestrian footpath in the adjacent road to the front door of the land use activity
- ◆ Minimises the need for pedestrian movements to cross vehicle paths as is practicable
- ◆ Minimises the potential for pedestrians/vehicle conflict. At conflict points of major pedestrian routes and vehicle routes through a site, pedestrian movement will have priority over vehicle movements and vehicle operating speeds shall be managed to be below 30 km/h

Further work required for inclusion within the Unitary Plan

Given that this is a new recommendation for the Unitary Plan, the above may require further consideration by the appropriate staff at Auckland Council and Auckland Transport.

6.10 Bicycle Parking

Discussion

Cycling is an important mode choice and will become increasingly important in the future within the Auckland region. If people are to be encouraged to cycle then they need to be convinced that it is safe, convenient, healthy and enjoyable and as part of this it is therefore important that bicycle parking is provided at destinations.

Currently there are only limited requirements within the existing District Plans for the provision of bicycle facilities for developments. Feedback received and international experience indicates that bicycle parking should be included in the Unitary Plan. It is recommended that the Plan provides a specification and requirement for bicycle parking/storage.

The specifications can be based on Austroads Part 14 Bicycles²¹ (1999) and AS 2890.5:1993, but without specific reference to these documents. That is to say, a statement that further guidance can be sought from these documents, but without specific reference, could be included.

Austroads suggests that parking for cyclists falls into three broad categories:

- ◆ All day parking for employees and students
- ◆ All day/part day parking at public transport stations, interchanges and terminuses
- ◆ Short term parking for visitors to shopping centres, offices and other institutions.

AS 2890.3:1993 similarly details three different types of facility classes and these are reproduced in a simplified version within the Waitakere District Plan. The dimensions for cycle parking facilities given are the same as the standard and the previous Austroads Part 14 Bicycles. This is shown below and it is recommended that it is adopted for inclusion in the Unitary Plan.

Auckland Transport is currently undertaking a review of ARTA's Guidance Note for Cycle Parking Facilities (2007). The outcome of this review will be an Auckland Transport revision of this document which will outline required bicycle parking provision required, types of parking facilities, lighting, signage and other issues.

As a result of this review the dimensions for bicycle parking are unlikely to change, although the number of user classes is likely to be simplified and the use of individual lockers may be removed. The dimensions for lockers have been retained in the recommended Unitary Plan text at this stage until the review of the Guidance Note is complete.

Recommended Standard

The design and location of cycle parking spaces shall be guided by Auckland Transport Code of Practice (ATCOP)

Further work required for inclusion within the Unitary Plan

Outcomes of the Auckland Transport review of ARTA's Guidance Note for Cycle Parking Facilities (2007) are to be incorporated into the Unitary Plan.

The Austroads standards diagrammatically represent the above requirements, making it much easier to understand. If necessary these diagrams could be included in the Unitary Plan.

6.11 Motorcycle Parking

Discussion

In addition to cycling as a mode choice, motorcycles are increasing being adopted by people as fuel prices rise and congestion increases. Typically motorcycle parking occupies only at least half the space requirement of a regular car parking space.

²¹ Austroads Part 11 Parking references AS 2890.1:1993, Transit New Zealand 2003 and Austroads (1999)

Motorcycle parking dimensions are not specifically dealt with within any of the District Plans, and only Waitakere City Councils' code of practice deals with the provision of motorcycle parking spaces (with regard to dispensation for a reduction of standard parking spaces). Of the overseas planning documents that have been reviewed only the Sydney DCPs deal with motorcycle parking provision (with no specific dimensions given).

Feedback received as part of the consultation process indicates that there should be information provided within the Unitary Plan with regard to motorcycle parking. This should take the form of the number required (dealt with in the separate parking ratio study) and the required dimensions.

Guidance as to the required dimensions can be taken from AS/NZS 2890.1:2004, simply 2.5 m deep by 1.2 m wide. The recommended on road motorcycle parking dimensions contained within the Austroads guides are the same as these off street space dimensions. There are no alternative dimensions detailed within any of the other documents that have been reviewed and therefore it is recommended that these dimensions are adopted within the Unitary Plan.

Recommended Standard

The recommended minimum dimensions for motorcycle parking spaces, if provided, are 2.5 m by 1.2 m. The gradient of a motorcycle parking space shall not exceed 1:50 (2%).

6.12 Parking and Loading Area Formation

Discussion

The formation of parking areas is reasonably consistent across the existing District Plans, with exceptions noted in the North Shore, Rodney and Franklin District Plans.

Recommended Standard

Before commencement of the Permitted Activity of that site, all parking and loading spaces, vehicle access and manoeuvring areas and aisles shall, before the commencement of the activity, be formed, finished with an all-weather dust-free surface, drained, marked out or delineated and maintained to the satisfaction of the Council.

Further work required for inclusion within the Unitary Plan

There is a need to consider whether this is a standard in its own right, whether it forms part of the overall assessment criteria for the design of parking and circulation areas.

6.13 Ensuring parking spaces are kept clear and available for use

Discussion

This matter deals with parking spaces being "free of goods" ensuring the spaces are available at all times for use, and not used to store goods. Without this requirement a land use may slowly encroach on a parking area to store goods, causing parking to be forced outside of parking areas or on street. There is currently a requirement within most of the District Plans to this effect and something of this

nature should be retained. The standard below is based on that contained in the Auckland Isthmus District Plan for inclusion in the Unitary Plan, although the reference to “free of charge” has been removed.

Recommended Standard

Parking areas must be kept clear and available at all times, free of impediment, for vehicles used in conjunction with the particular activity to which the parking spaces relate on the site, and must not be used for the deposit or storage of any goods or materials or for any other purpose.

Further work required for inclusion within the Unitary Plan

We note the inclusion of “for vehicles used in conjunction with the particular activity” to avoid the leasing or on-selling of excess parking being able to occur as a permitted activity. We recognise the advantages of shared parking the likelihood of the Unitary Plan encouraging this. However this needs to be dealt with on a case by case basis, and not as part of a default, generic standard.

6.14 Vehicle Queuing

Discussion

The Manukau, North Shore and Rodney District Plans address vehicle queuing in order to minimise the impacts of any vehicle queuing that may occur on the site and ensuring this does not affect the surrounding road network. These are valid concerns as an inappropriately designed site can cause a significant adverse effect on the road network.

In a similar vein, a poorly located entrance barrier arm can leave a vehicle exposed in a live vehicle lane, or cause an unnecessary impediment to pedestrian movement along a footpath

Recommended Standard

Sites shall be laid out in such a way that vehicles using or waiting to use fuel dispensers, ticket vending machines, remote ordering facilities and devices, entrance control mechanisms, or other drive through facilities shall not queue into the adjoining road or obstruct entry to or exit from the site.

6.15 Stacked Parking

Discussion

The existing District Plans refer to ‘stacked’ parking being defined as parking that occurs when access to a parking space is achieved through another parking space. This includes both ground level stacking (ie one space behind the other) and vertical stacking (through the use of a mechanical stacker).

It is recommended that both types of stacking are acceptable within the Unitary Plan, based on experience in Auckland and feedback received, but generally only in special circumstances. Overseas research shows provisions that where development includes a mechanical parking installation, such as car stackers, turntables, car lifts or another automated parking system, the development application is to include a Parking and Access Report. It is expected that a development containing such any

mechanical parking devices is likely to be accompanied by a report prepared by a professional traffic engineer, providing an assessment of the suitability of such devices.

Recommended Standard

Stacked parking occurs when access to a parking space is achieved through another parking space. This can refer to both horizontal and vertical stacking (mechanical)

Stacked parking may be permitted in the following circumstances

- ◆ Associated with residential development stacked parking may be approved where no feasible alternative exists, and the stacked parking is held in common ownership under a single title and cannot be offered or allocated as individual parking spaces.
- ◆ Stacked parking can be provided for vehicles being serviced at vehicle repair premises.
- ◆ In some circumstances stacked parking may be allowed as a means of providing staff parking. The staff parking area shall be clearly defined, marked and separated from other required parking on the site.
- ◆ Any stacked parking shall not compromise the operation of the remainder of parking area.

Where development includes a mechanical parking installation, such as car stackers, turntables, car lifts or other automated parking systems, the development shall be specifically designed to the satisfaction of the Council.

Access to mechanical parking installations such as car stackers, shall be by means of access driveways and circulation roadways designed in accordance with the relevant criteria within the Unitary Plan. Sufficient vehicle storage shall be provided to ensure that queues of vehicles awaiting service by the installation do not extend beyond the property boundary of the parking facility under normal foreseeable conditions.

6.16 Urban Design – Good Design

Urban design has become an integral component of vehicle access, parking and loading design. It is typical for an urban designer to be part of a project team, influencing the design, and responsible for the place-making of a development. The key aspects of urban design, relative to this report, are

- ◆ Places for people – ensuring places are well designed to be safe, comfortable and attractive
- ◆ Make connections - places need to be easy to get to and be integrated physically and visually with their surroundings, requiring attention to how to get around by foot, cycle, public transport and the private car.

One of the key aspects that urban designers usually raise is the location of the car parking relative to the development. The general principle for this seems to suggest that car parking, in most circumstances, is best located to the rear of a development, contrary to what currently occurs. The manner in which car parking is arranged has a fundamental effect on the quality of the space, causing vehicles to dominate the space at the inconvenience of pedestrians and cyclists. It may be that the need to consider the location of parking relative to the development could be triggered by the number

of parking spaces to be provided. For example, 50 car parks or more may only be permitted at the rear of the development.

One of the other key matters to consider, and dealt with under the parking provision work also being done by Flow, is encouraging innovative parking outcomes, such as shared parking, in order to achieve a high quality urban form while also achieving the economic viability of developments.

Further work required for inclusion within the Unitary Plan

In attempting to develop a recommended standard to address this issue it becomes apparent that this standard may be better linked to a land use zoning, or whether there will be independent “urban design” criteria within the Unitary Plan. Consequently if there is a need to include commentary within the parking and loading design chapters, there is a need to understand more clearly what is being sought elsewhere in the Unitary Plan.

Therefore a recommended standard has not been suggested at this stage.

6.17 Landscaping

Discussion

A well landscaped parking area should enhance the visual environment and integrate the development into the surrounding area without hindering visibility of drivers and pedestrians.

The provision of landscaping within a parking area is only a requirement within three existing District Plans (Manukau, Waitakere and Rodney). The requirements differ within each of these District Plans however the general aim is the same, that is landscaping/tree planting is to provide some visual relief to large parking areas.

Feedback received emphasised that good design and landscaping is more necessary in future development, although it is difficult to specify how prescriptive the Unitary Plan should be.

Low Impact Design is also a key consideration with stormwater management techniques and landscaping offering the opportunity to reduce the overall environmental impact of a parking area.

Recommended Standard

As opposed to developing a specific standard it is recommended that the need for landscaping of a parking area be identified as part of the assessment criteria for the consent process. This could therefore address a range of landscaping matters including planting and maintenance specifications, landscaping separation of parking areas from footpaths, perimeter planting/screening, planting being setback for amenity reasons and so on.

Further work required for inclusion within the Unitary Plan

A number of matters have been raised as to the landscaping treatments of parking areas. Given the wide ranging comments it is recommended that further consideration be given as to the inclusion of landscaping matters as part of the assessment criteria of a parking area. This can then give a more detailed range of matters that need to be considered, as opposed to trying to develop a generic rule..

6.18 Screening

There are existing requirements within the Auckland City Isthmus, Central and Hauraki Gulf Plans, the North Shore and the Rodney District Plans for screening of parking and loading areas from adjacent sites or public places. This is to prevent adverse noise, lighting or visual impacts on residential zoned properties.

Sydney City's Plan goes one step further than the existing District Plans and specifies that all non-residential parking at ground level and above is not to be visible from the public domain, nor shall vehicle access ramps. This is a much broader requirement, rather than being restricted to developments located adjacent to residential activities. This aspect has been suggested as a standard applicable to Auckland's Central Area, or within key town centres about the region

Recommended Standard

Where four or more parking spaces are provided on a site which is adjacent to, or faces land zoned residential or open space, the area comprising such spaces shall be screened from residential or open space zoned properties

Screening shall be provided in the form of fencing or landscaping, in order to reduce to an acceptable level any adverse aural or visual impacts on residential and open space zoned properties

Further issues to consider for the Unitary Plan

A number of comments were received with regard to this recommendation, and in particular how the screening is designed to ensure no adverse CPTED issues, or big blank walls that have no visual appeal. Consequently there may be a need to consider further assessment criteria to ensure the appropriateness of any screening. It may also be that other aspects of the Unitary Plan deal with this, for example good urban design objectives may provide a better mechanism for which to achieve the appropriate screening design

6.19 Lighting

Discussion

It is important to provide lighting in parking areas, access driveways and pedestrian areas but generally only if they are public parking areas that are intended to be used at night. Providing lighting is one part of Crime Prevention Through Environmental Design (CPTED) and while the Unitary Plan does not need to specify all types of CPTED practice, lighting is a simple and effective means.

Further to this it is important the lighting is positioned within a site in order to minimise the level of lighting spill into neighbouring properties, particularly residential.

Only three of the existing District Plans state lighting requirements. These Plans however do not state specific lighting standards.

The off-street parking standard (AS/NZS 2890.1:2004) states that the areas mentioned above should be adequately lit, and refers to two other standards for specific details (one for roofed and one for

open air parking areas). It is considered that these standards need not be referenced within this parking section of the Unitary Plan. The requirement to have the areas adequately lit is sufficient.

Recommended Standard

Parking areas and circulation areas, together with pedestrian pathways that are anticipated to be used during the hours of darkness, shall be adequately lit. Illumination shall not be directed towards any adjacent residentially zoned land.

Further issues to consider for the Unitary Plan

The above standard is taken from the off-street parking standard, AS/NZS 2890.1:2004. It includes parking areas, circulation areas and pedestrian pathways. Including parking areas seems to differ slightly from the Manukau District Plan which states that lighting shall be provided in access driveways and pedestrian areas within public parking areas. It is thought the intent is that lighting is provided within the actual parking area as well.

It is recognised that further work is likely to ensure the intent of this standard is achieved.

6.20 Fractional Spaces

Discussion

When determining the parking requirements for a development, invariably the calculation results in a fraction of a car park required. The recommended standard identifies how to correctly round up or down to avoid any confusion

Recommended Standard

When the calculation to assess parking space requirements results in a fraction, if the fraction is less than one half it shall be disregarded, if half or more than one whole additional parking space shall be required.

6.21 Small Car Parking Spaces

Discussion

Austrroads Part 11 provides commentary on small car bays. This states that up to 2006 the trend was towards larger recreational vehicles and family sedans, but post-2006 the trend appears to have reversed in light of fuel pricing and environmental factors. Therefore the proportion of small vehicles is constantly changing and Austrroads recommends adopting universally sized car bays unless there is strong justification to do otherwise. If adopted, small car bays should be used only in remnants of space and should not exceed 15% of total capacity. The bays should be the 'substandard' spaces and should be used by staff for example.

AS/NZS 2890.1:2001 provides recommended dimensions for 'small' parking spaces, being 2.3m by 4.5m for New Zealand conditions.

Waitakere District Plan states that small car parking spaces can be used when it is impractical to provide all spaces to 90-percentile standard, and that the number of small spaces is no more than 10% of the total number.

Recommended Standard

The following is not a permitted activity, but could be included as assessment criteria relative to the design of parking areas.

Spaces suitable for small cars only may be considered within a car-parking area, provided that it would be impractical to provide all spaces to 90-percentile standard, and that the number of small spaces is no more than 10% of the total number.

7 CENTRAL AREA

7.1 Introduction

As part of this commission Flow has been required to give advice on whether any modifications to the above parking, loading and access standards suggested for the Auckland region need to be made to address the specific requirements of the Auckland City Centre.

In this regard it is noted that while the Auckland City Centre is considerably different to the rest of Auckland in terms of urban form, there are no significant differences with regard to the desired outcomes to be achieved relating to access, parking and loading facilities. These outcomes identified previously are:

- ◆ Efficient and safe access for vehicles (including freight) and pedestrians in and out of properties, including the safety of pedestrians on the footpath when in conflict with vehicles entering and leaving a property
- ◆ Well designed parking areas and parking buildings resulting in ease of use and safety for all types of users, including long stay, short stay, mobility impaired, cyclists and pedestrians.
- ◆ Well designed parking and loading areas, with good visual amenity through sleeving, planting and screening.
- ◆ Well designed service areas, resulting in ease for the various types of users

Indeed while there are two separate District Plans for the Auckland City Centre and the Auckland Isthmus, there are only three differences between the two Plans with regard to access, parking and loading requirements. These are as follows:

- ◆ The number of permitted vehicle crossings per site (The Isthmus Plan permits two vehicle crossings while the Central Area Plan permits one vehicle crossing in pedestrian orientated areas and two vehicle crossings elsewhere)
- ◆ Access from multiple road frontages (This is not included in the Isthmus Plan, while the Central Area Plan only permits access from certain types of roads)
- ◆ Bus/coach parking requirements for hotels, serviced apartments and entertainment facilities, excluding cinema complexes

Taking the above into account it appears that almost all of the access, parking and loading standards outlined above are applicable to the Auckland Central Area. Accordingly the following section concentrates on the possible modifications to these standards which are relevant to the Auckland City Centre. It is expected that while these recommended standards relate to the Auckland City Centre they may also be applicable to other large centres in the Auckland region.

It is also highlighted that as part of a separate commission Transport Planning Solutions and Urbanismplus (TPS & U+) are developing parking standards for the Central Area, with urban design matters having been identified within their draft report (dated 26 October 2011). Section 7.2 provides the matters of the TPS & U+ relevant to this report, being vehicle access, parking and loading to ensure consistency, or identify the points of difference that may require further consideration.

7.2 Comparison with Urban Design Findings of TPS & U+ City Centre Report

The following table compares the findings of the draft TPS & U+ report and how this fits with the recommendations made

Table 8: Comparison of City Centre Recommendations

Matter to Consider	Recommendations of the draft TPS & U+	Relevance to recommendations made
Footpath crossings	Minimise the number of crossing points (if any). Decisions on the provision of an additional crossing or crossings should balance the negative effects on pedestrians against the adverse traffic effects of not providing the additional crossing or crossings.	We have identified a number of issues to be addressed when determining the number of vehicle crossings serving a site, as well as a number of matters requiring further discretion or to be included as assessment criteria. The recommendations made in the TPS & U+ report can also be included as assessment criteria.
Crossing widths	The standard crossing should be a single crossing perpendicular to the kerb, with a maximum width of 3.1m. Where it is demonstrated that a double crossing is essential, the inbound and outbound directions should be separated by a pedestrian refuge with a minimum width of 2.0m. Parking barrier arms or gates should be set back at least 6m from the property boundary. No more than 2 crossing points should be permitted along a street frontage.	Our recommendations are <ul style="list-style-type: none"> ▪ 3.0 m for one way traffic. ▪ 2.0 m separation between crossings This is relatively consistent with the TPS & U+ findings. One point of difference we would have with the TPS & U+ findings is the recommendation of gates being set back from the property boundary as this raises some CPTED issues.
Crossing sight lines	1.5m sight line splays should be provided on either side of the vehicle entry between the front property boundary and the vehicle entry itself. These splays should reduce to zero at the barrier arm/gate set 6m back from	Section 5.7 recommended the provision of sight line splays for pedestrians - although our recommendation is for 2.0 m splays. Given the intensification within a city centre it may be necessary to relax the size of this splay as suggested in the TPS & U+ findings – although it is

	the property boundary	highlighted that pedestrian numbers in the city centre are much higher than anywhere else in the region
Separate pedestrian and vehicle access	Pedestrian accessways should be separate from vehicle accesses, visually conspicuous and, where possible, located towards site corners. They should include canopies for weather protection and lighting, and should be integrated with the ground floor of the building	A recommendation of a similar nature has been made at Section 5.9 – although our recommendation is more concerned with the gradient of the pedestrian access
Active frontages	Active edges and building continuity should be required along all street frontages (except vehicle and pedestrian access points).	Not specifically relevant to our report
Street level parking	Street level parking should be located behind another activity (“sleeved”) to ensure it is hidden from view. A minimum setback of 15m is required, but may be reduced by way of resource consent. Sleeving is critical at ground level, but should also extend to at least the first and second floor levels.	We have recommended screening and sleeving in Section 7.6, with some consistency between our recommendation and that of the TPS & U+ report. Given that this element is a matter of greater relevance to urban design, we have ensured our recommendation is consistent with this
Screening parking	Parking adjoining a street above the levels that are sleeved must be screened. Screening must be designed to be an integrated and continuous extension of the facade.	As above
Stud Heights	Parking facilities at and above ground level are to have a stud height sufficient for “habitable level requirements”. Typical ground floors in CBDs range from 4.5 to 5m.	Not specifically relevant to our report
Porte Cocheres	Porte cocheres are not supported within the City Centre. Where feasible, provision for tour buses, coaches and taxis should be provided by the Council on-street. Where this is not feasible, porte cocheres should only be provided for through a rigorous consent process	Our recommendations at Section 7.7 is of a similar fashion to this
Temporary car parks	Temporary car parks should be subject to similar requirements to permanent car parks in terms of	Not specifically relevant to our report

	access points and the need to fit into the urban environment	
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7.3 Vehicle Accesses

Discussion

The number of permitted vehicle accesses in the Central Area District Plan is restricted to one in pedestrian orientated areas. This recognises the importance of safeguarding pedestrian amenity and priority along these key corridors. In essence, the recommended conditions identified in Section 5 have been developed with the Central Area in mind and hence are deemed to be sufficient in addressing the design of an access within the Central Area.

7.4 Access Restrictions

Discussion

The existing Central Area Plan requires a site, if having multiple road frontages, to be accessed from the road of lower hierarchy/volume.

Given the need to safeguard pedestrian amenity and priority within the Central Area it is recommended that this standard remains. Further, it is recommended that this standard could be widened to include all town centres within the Auckland region.

Motorway Interchange controls has been addressed in Section 0.

Recommended Standard

Where a site has frontage to more than one road and/or service lane, access shall be obtained from the road or service lane that is lower on the road hierarchy. Where the road or service lane frontages all have the same classification in the hierarchy, then vehicular access shall be obtained from the road or service lane carrying the lesser volume of traffic.

Further issues to consider for the Unitary Plan

As discussed, it is recommended that this standard could be broadened to include town centres. This will be dependent on how the new Unitary Plan classifies town centres as well as the road hierarchy to be adopted within the new plan. This recommendation could be included as a general recommendation for all vehicle crossings in the region.

7.5 Urban Design

Discussion

Within the Central Area, as well as town centres, urban design matters are likely to be of greater importance given:

- ◆ The public domain and the interface of development with the public domain gives people their primary experience of the City
- ◆ Active frontages to streets are vital so as to provide contact between the street and development.

Urban design is a critical element within the Central Area, given the high concentration of both pedestrian, private vehicle and public transport movements through this area. As intimated earlier in this report, it is difficult to develop necessary access, parking and loading standards without understanding how these correlate to urban design matters within the Unitary Plan.

7.6 Screening of Parking

Discussion

The screening of parking within the Central Area, and also potentially within town centres, is of greater importance given the concentration of pedestrians within these areas. In achieving high quality urban design there is a need to strengthen the screening of parking areas within these high pedestrian movement areas.

Guidance on screening is included in Sydney City's plan, where it specifies the following:

- ◆ All non-residential parking at ground level and above is not to be visible from the public domain
- ◆ Vehicle access ramps are to be located inside the building and are not to be visible from the public domain
- ◆ Car parking areas at ground level are to be sleeved by other uses with a minimum depth of 6.0 m that front and activate the street
- ◆ Basement parking areas and structures:
 - In the Central Area, are not to protrude above the adjacent street or public domain level
 - In other areas, are not to protrude more than 1.2 m above the adjacent street or public domain level. Where they are visible, basement structures and vent grills are to be integrated into the building and landscape design. Ventilation grills must block views into basement areas and, in appropriate locations, be screened by landscaping in garden beds with a minimum depth of 1.0 m.
- ◆ Car parking spaces are not to be located in areas used for the manoeuvring of service vehicles.
- ◆ Where parking is at ground level, it is to be:
 - Located to the rear or side of buildings and not visible from the street and public domain
 - Incorporated into the building and screened by other uses
 - Designed with materials, details, and proportions and landscaping.

The above is suggested as potential assessment criteria applicable to Auckland's Central Area, and within key town centres in the Auckland region

Recommended Standard

The TPS & U+ draft report makes a number of recommendations as to the screening and sleeving of parking spaces, as summarised in Table 8: . Given that this matter is of greater relevance to achieving good urban design we recommend that adoption of the TPS & U+ recommendations

7.7 Porte Cochere

Discussion

Porte cocheres are typically linked with hotel developments, providing a large paved area at the front entrance for the pick-up and drop off of patrons, capable of accommodating tour coaches as the largest vehicle. These areas can be detrimental to the pedestrian amenity on the adjacent road network, providing a large inhospitable space for pedestrians to manoeuvre through and resulting in a considerable pedestrian-vehicle conflict area.

Given that this matter is not adequately dealt with in the existing Central Area District Plan the following has been sourced from the Central Sydney Development Control Plan.

Recommended Standard

Porte cochere are not favourable within the Central Area and are therefore not a permitted activity. The provision of a porte cochere within a development will be subject to relevant assessment criteria

Matters for Discretion

A porte cochere may only be permitted for developments subject to urban design, streetscape and pedestrian amenity considerations.

Where practicable a porte cochere should be internal to the building with the vehicle access to the porte cochere kept to the absolute minimum.

Further issues to consider for the Unitary Plan

Further assessment criteria are likely to be necessary, particularly in regard to providing further matters around urban design, streetscape and pedestrian amenity considerations

7.8 Bus and Coach Parking

Discussion

Bus and coach parking requirements feature in the existing Central Area plan, with typical dimensions provided as to the width, length and height requirements necessary to cater for these vehicle types on a particular site. The existing standard within the Central Area refers to an overall length of 11.0 m. This is shorter than a typical tour coach, measuring 12.6 m in length. It is therefore recommended that this standard is updated to reflect the length of the tour coach. Additional standards have been added to ensure the safe operation of these uses

Recommended Standard

All bus and coach parking spaces shall:

- ◆ Have minimum dimension of 12.6 m long and 3.5 m wide, with a vertical clearance of at least 3.8 m
- ◆ Are to be designed to preclude any unsafe reverse manoeuvres.

8 DISCUSSION AND CONCLUSIONS

The approach to this project has been to develop access and parking/loading standards for inclusion in the Unitary Plan which are outcome focused. Therefore while guidance has been obtained from the standards of the existing District Plans, the project has identified through workshops and consultation with many Council officers who work with these standards on a day-to-day basis, the outcomes that have been delivered by the existing standards, and where improvements to these outcomes could be made. Therefore through this process the outcomes of the existing standards have been challenged. Taking into account the results of a comprehensive literature review of best practice standards and guidance documents relating to access, parking and loading design, new standards have been developed for inclusion in the Unitary Plan.

Specifically the outcomes which the access, parking and loading standards in the Unitary Plan are striving to achieve include:

- ◆ Efficient and safe access for vehicles (including freight) and pedestrians in and out of properties, including the safety of pedestrians on the footpath when in conflict with vehicles entering and leaving a property
- ◆ Well designed parking areas and parking buildings resulting in ease of use and safety for all types of users, including long stay, short stay, mobility impaired, cyclists and pedestrians.
- ◆ Well designed parking and loading areas, with good visual amenity through sleeving, planting and screening.
- ◆ Well designed service areas, resulting in ease for the various types of users

It is recognised that many of the recommended standards resemble what have been included previously within the existing District Plans. These standards have been adopted following a comprehensive review of the available literature and found to still offer the best outcome, with many of the existing standards being clearly written and understandable. Where necessary, existing standards have also been re-written, with additional criteria included to ensure a broader range of matters is considered. Through this process it has also become apparent that the transport and urban design policies and objectives of Unitary Plan may influence the generic access, parking and loading standards. Without yet knowing what these policies and objectives of the Unitary Plan are, the generic standards have been kept, as the wording suggests, generic. However, there will need to be a cross-check made once the policies and objectives are developed to ensure the standards are applicable, offering the opportunity to make these standards more prescriptive.

Specifically it is noted that matters that have proved difficult to create generic standards for include:

- ◆ Urban design elements relating to the design of parking areas
- ◆ Access design relating to garages and residential properties.

Difficulties have arisen as many of the design aspects for these topics may be included elsewhere in the Unitary Plan, possibly better located in the land use activity sections or in urban design guidelines. Many of the urban design matters can also be very site specific. The Newmarket and New Lynn Plan Changes introduced new criteria with respect to urban design and vehicle access, but these were dependent on the particular area and the outcomes each area were striving to achieve.

With respect to garage and residential property access design, significant feedback was received in relation to child safety in residential driveways, with information from the SafeKids website outlined in Section 4.2.2. Feedback from Auckland Council officers also highlighted processing issues with residential properties and inadequate on site manoeuvring to and from residential garaging. Both of these matters can be linked to the design of the residential property, and may require further assessment in terms of how the best outcomes could be achieved and where in the Unitary Plan this should be located. It is recognised that garage dimensions has been touched on by some of the existing District Plans, and an example of an Australian standard has also been included. However it is not clear.

Overall, the recommended standards offer a step change in the design of vehicle access, parking and loading. A focus on pedestrian amenity has been incorporated through many of the standards, aiming to provide a more positive experience for pedestrians. Change has also been recommended in the landscaping and screening of parking areas, attempting to promote aspects of quality urban design, although it is recognised that there may be other assessment criteria needed in order to achieve high quality urban design across the board.

The recommended standards have been developed following a significant review of relevant material, and are consequently considered a robust set of default standards, suitable for inclusion in the Unitary plan. There are instances where the recommended standard may require further consideration, and this has been highlighted in the report. The further work is typically required where a new standard is being introduced to Auckland and may require justification for use in the Auckland region. Of particular importance is the definition of a high pedestrian corridor.

APPENDIX A

District Plan Comparison

REVIEW OF DISTRICT PLANS

Summary of Existing Auckland District Plans

Criteria	Auckland City			Manukau City Chapter 8	North Shore City Section 12	Waitakere City Code of Practice Section 3: Appendix C	Rodney District Part 21	Papakura District Section 2 Section 3, Part 15	Franklin District Part 9, 29, 51
	Isthmus Section Part 12	Central Area Part 9	Hauraki Islands Part 13						
Objectives of access, parking and loading.					Yes		Yes, page 14.		
Width (maximum and minimum)	Between 2.4 to 6m, depending on multiple factors. Sum total to be 7m or less	Between 2.4 to 6m, depending on multiple factors	n/a	Between 2.5 and 9m, depending on multiple factors	2.75m minimum, maximums 3.5m to 9m depending on zone and size of street frontage	Between 2.5m and 7.5m, depending on multiple factors	Maximum 6m residential, 10m elsewhere, governed by relevant tracking	n/a	Generally to be 3m wide, but may be larger
Number permitted per site	2	1 in pedestrian-oriented areas 2 elsewhere	n/a	n/a	1 to 2, depending on zone and size of street frontage	The smallest that results in reasonable delay for entrance traffic	2 permitted when site frontage is 60m or less	n/a	Between 1 and 3 in business zones, depending on frontage
Maximum total crossing width as a percentage of site frontage	50%	50%	n/a	n/a	n/a	n/a	n/a	n/a	50%, in business zones only
Distance between crossings	n/a	n/a	n/a	In non residential areas 3m minimum between crossings, 1.5m minimum from boundary	9.5m minimum	2m minimum	6m minimum between crossings serving same property, 18m when serving private ways	n/a	Yes, depending on posted speed and access volume
Maximum gradients	Residential 1:4 Other 1:8	For loading 1:8 All other 1:4	1:6, with exceptions	Residential 1:5 Other 1:8	Residential 1:5 Other 1:8	Between 10 and 33%	n/a	1:5	n/a
'Level' platform required where access meets road reserve	Yes	Yes	n/a	Where crossing exits onto a primary road and is used by heavy vehicles	n/a	Yes	Yes	n/a	n/a
Gradient transitions required	n/a	n/a	n/a	Yes	n/a	Yes	n/a	Yes	n/a
Overhead clearances	n/a	n/a	n/a	n/a	n/a	Yes	Yes	n/a	n/a

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Criteria	Auckland City			Manukau City Chapter 8	North Shore City Section 12	Waitakere City Code of Practice Section 3: Appendix C	Rodney District Part 21	Papakura District Section 2 Section 3, Part 15	Franklin District Part 9, 29, 51
	Isthmus Section Part 12	Central Area Part 9	Hauraki Islands Part 13						
Areas where crossings cannot be located as of right (eg on identified sites or within a certain distance of intersections involving primary roads as per the 'vehicle access restriction' and the 'defined road boundary' controls in the ex-Auckland City district plans)	When within defined road boundary, abutting an interchange control area or within a vehicle access restriction control	When within defined road boundary, abutting an interchange control area or within a vehicle access restriction control	Within defined road boundary	From 6m to 50m, depending on road hierarchy	Between 15m and 30m from adjacent intersection, depending on road hierarchy and permitted turning movements	n/a	Within defined road boundary or 60m of adjacent intersection when on State Highway	Driveways to be located in the most convenient and practical position possible	Minimum distances from side roads supplied, dependant of posted speed and access volume
Sight distance requirement	n/a	n/a	n/a	When located on or within 50m of a primary road	For drive through and high vehicle generating activities	Yes	n/a	n/a	Yes
Reinstatement of crossings no longer required	Yes	Yes	n/a	n/a	Yes	n/a	Yes	n/a	n/a
Accesses to be properly formed, drained, sealed and delineated	Formed, drained and paved to the satisfaction of the Council	Formed, drained and paved to the satisfaction of the Council	Formed, drained and paved to the satisfaction of the Council	Yes, exceptions for single household units	Yes, with exceptions	n/a	Yes, but may be unsealed under some circumstances	Yes	Yes, in business zone only
Vehicle tracking curves	99%ile car & truck	99%ile car & truck	90%ile car & truck	Must accommodate the swept path of largest vehicle expected to use it	90%ile car & truck	99%ile car & truck	n/a	90%ile car, 90%ile & 99%ile truck	90%ile car
Access from multiple road frontages	n/a	Access only from road of lower hierarchy/volume	n/a	n/a	n/a	Access only from the more minor of the two roads	Access to be gained from service lane or right-of-way if available	n/a	n/a
Whether reverse manoeuvring onto the road or service lane is permitted	Varies depending on multiple factors	Varies depending on road type	n/a	Varies depending on multiple factors	Varies depending on multiple factors	Varies depending on multiple factors	Varies depending on multiple factors, not allowed for loading spaces	Varies depending on multiple factors	Only with prior approval
Provision for vehicle queuing at fuel dispensers, ticket vending machines, drive through facilities etc	Yes	n/a	n/a	Yes	Yes, if arterial or collector is involved	n/a	Yes	Yes	n/a
Angle of intersection with road	n/a	n/a	n/a	Between 45° and 90°	n/a	n/a	n/a	n/a	n/a

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	Isthmus Section Part 12	Central Area Part 9	Hauraki Islands Part 13						
Demarcated lanes required	n/a	n/a	n/a	n/a	n/a	n/a	2 lanes for accesses serving 10 or more parking spaces	n/a	n/a
Provisions relating to the removal of street trees, furniture, signs or signals	n/a	n/a	n/a	Yes	n/a	n/a	Yes	n/a	n/a
Specific provisions applying to service stations and truck stops	n/a	n/a	n/a	Yes	Yes	n/a	n/a	n/a	n/a
Parking space dimensions	Tables given, differs from ANZS2890	Tables given, differs from ANZS2890	Tables given, differs from ANZS2890	Tables given, differs from ANZS2890	Tables given, differs from ANZS2890 Refers to Austroads Part 11	Tables given, differs from ANZS2890; up to 10% may be for 'small cars'	Tables given, differs from ANZS2890, 2.1m vertical clearance	Tables given, differs from ANZS2890	Tables given, differs from ANZS2890
Loading space dimensions	Varies, from 6m to 11m minimum depths, depending on land use. 3.5m minimum width, 3.8m minimum height	Minimum width 3.5m, height 3.8m, depth from 6m to 11m	To suit 90%ile truck	Minimum width 3.5m, height 3.5m, depth 7.5m	Minimum width 4m, height 4.25m, depth from 8m to 11m	Tables given for different design vehicles	Minimum width 3.5m, minimum depths 12m to 18m, 3.8m vertical clearance	Minimum width 3.5m, minimum depths 7.5 to 11m, minimum height 3.5m	n/a
Disabled parking requirements	NZS4121	NZS4121	NZS4121	NZS4121	NZS4121	NZS4121	Dimensions given, NZS4121 referred to	Reference made, but no dimensions or standard offered	Dimensions given
Cycle parking requirements	n/a	n/a	n/a	n/a	To Austroads 14 standards	To Austroads 14 standards	n/a	n/a	n/a
Motorcycle parking requirements	n/a	n/a	n/a	n/a	n/a	No dimensions provided, but rules on dispensation with regard to provision of spaces	n/a	n/a	n/a
Minimum design envelope or internal dimensions (free of columns, walls, etc)	Yes	Yes	Yes	Yes	90%ile car & truck tracking curves to be used	Spaces adjacent a restraint must be wide enough to function as if there were no restraint	n/a	n/a	n/a
Minimum bus/coach parking, loading and access standards	n/a	Yes	n/a	n/a	n/a	Yes	n/a	n/a	n/a
Gradients	Parking varies from	Parking varies from	n/a	n/a	Residential 1:15	Parking 6%	1:8, except	n/a	n/a

Summary of Existing Auckland District Plans

Criteria	Auckland City			Manukau City Chapter 8	North Shore City Section 12	Waitakere City Code of Practice Section 3: Appendix C	Rodney District Part 21	Papakura District Section 2 Section 3, Part 15	Franklin District Part 9, 29, 51
	Isthmus Section Part 12	Central Area Part 9	Hauraki Islands Part 13						
	1:12.5 to 1:20 Loading 1:12.5	1:12.5 to 1:20 Loading 1:12.5			Public 1:20	Loading 3% Minimum 2% (concrete) or 3% (bitumen)	household units		
Vehicle circulation and tracking curves	99%ile car & truck, internal circulation designed to the satisfaction of the Council	99%ile car & truck	90%ile car & truck	90%ile car & truck	90%ile car & truck	Parking 90%ile car & truck, circulation 99%ile car & truck	To accommodate appropriate tracking curve	90%ile car, 90%ile or 99%ile truck, depending on land use	90%ile car, 12.3m truck
When stacked parking is acceptable	Under certain circumstances	Under certain circumstances	n/a	n/a	Under certain circumstances	Under certain circumstances	Only at service repair premises and individual household units	Only at service stations and service garages	n/a
Requirement for a kerb or similar barrier where parking or manoeuvring area is adjacent to a road/boundary	Yes	Yes	Yes	n/a	Yes	n/a	Yes	n/a	n/a
Loading space location convenient for goods handling/ useable location	Yes	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Provide for lighting of access driveways and pedestrian areas within public parking areas used during the hours of darkness	n/a	n/a	n/a	Yes, exceptions for single household units	n/a	Yes	n/a	Yes	n/a
Landscape design for parking areas	n/a	n/a	n/a	Yes, depending on size	n/a	Yes, depending on size	Yes, depending on zone type. Protection and maintenance of landscaping required	n/a	n/a
Requirements for parking and loading in areas to be screened from adjacent sites or public places	When facility numbering 4 or more spaces is adjacent or facing a residential zone	When facility numbering 4 or more spaces is adjacent or facing a residential zone or Open Space Precincts	When facility numbering 4 or more spaces is adjacent to or visible from a residential zone	n/a	Where site falls within business zone buffer strip	n/a	When facility numbering 4 or more spaces is adjacent or facing a residential zone	n/a	n/a
Parking and loading areas to be properly formed, drained, sealed	Yes	Yes	Yes	Yes, exceptions for single household	Yes, with exceptions	n/a	Yes, but may be unsealed under	Yes	Yes

Summary of Existing Auckland District Plans

Criteria	Auckland City			Manukau City Chapter 8	North Shore City Section 12	Waitakere City Code of Practice Section 3: Appendix C	Rodney District Part 21	Papakura District Section 2 Section 3, Part 15	Franklin District Part 9, 29, 51
	Isthmus Section Part 12	Central Area Part 9	Hauraki Islands Part 13						
and delineated				units			some circumstances		
Parking/loading space/manoeuvring area permitted between building line designation and road alignment or on land designated for road purposes?	Non complying	Non complying	n/a	n/a	Only if surplus to minimum parking requirements	n/a	Non complying	n/a	n/a
Use of yard space for parking and loading				Yes – with restriction					
Parking spaces to be kept available and free from deposited or stored goods or materials	Yes	Yes	Yes	n/a	Yes	n/a	Yes	Yes	Yes
Maximum distances specified for reversing out of parking spaces	n/a	n/a	n/a	For non residential activities	For certain business zones	n/a	n/a	n/a	n/a
Multiple parking areas within single site to be connected via internal access	n/a	n/a	n/a	For non residential activities	n/a	n/a	n/a	n/a	n/a

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APPENDIX B

Best Practice Comparisons

REVIEW OF STANDARDS

AS/NZS 2890.1:2004 Off-Street Parking

- ◆ Predominantly based on classification of users of off-street car parking facilities
- ◆ Provides commentary on small cars bays and tracking requirements. The Australian car fleet has become large over the last 15 years (publication in 2004). No mention of the fleet now reducing in size however.
- ◆ Design vehicle characteristics given for 85th and 99th percentile cars.
- ◆ Ground clearance templates supplied.
- ◆ Capacity provisions at entry and exits at large car parks supplied.

NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities

- ◆ In addition to information in table below, gradients given for footpaths (maximum 1 in 50) and ramps, landings etc.
- ◆ AS/NZS 2890.6 Off-street parking for people with disabilities is also available but hasn't been reviewed as NZS 4121 deals with all necessary issues.

AS 2890.5: 1993 Parking Facilities Part 3: Bicycle Parking Facilities

- ◆ Division into user class 1 to 3 for parking facilities, from high security to low security
- ◆ Storage requirements regarding storage layouts - lockers, open rows, nose to tail, vertical storage, open plan layouts.
- ◆ Floor slopes
- ◆ General requirements given regarding location and clearances (to vehicle and pedestrian traffic), and safety of pedestrians
- ◆ Signage requirements and type of signs where necessary
- ◆ Requirement for areas to be lit to minimise theft and vandalism. Consideration should be given to AS 1158.1 Lighting for roads and public spaces
- ◆ Weather protection, security
- ◆ Access path requirements
- ◆ Appendix gives typical parking facilities description and diagrams

AS 2890.2: 2002 Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities

- ◆ Classes of design vehicle small rigid vehicle (SRV), Medium rigid vehicle (MRV), Heavy rigid vehicle (HRV), Articulated vehicle (AV) (dimensions given).
- ◆ Three categories for access design are “occasional access”, “regular service - major road”, “regular service - minor road” and requirements for access is based on these.
- ◆ The swept path of the design vehicle likely to use the facility is to dictate the roadways and overrides the provided tables.
- ◆ Deals extensively with loading docks as well as service areas.
- ◆ Minimum dimensions for driveway sight splays for pedestrians.
- ◆ Minimum design layouts provided for one-way and two-way driveways.
- ◆ Design vehicle turning path templates given and design vehicle ground clearance diagrams.

AS 2890.3: 1993 Parking Facilities Part 5: On Street Parking Facilities

- ◆ Parallel, angle or centre-of-road parking (either parallel or angle).
- ◆ Markings in accordance with AS 1742.11
- ◆ Parallel spaces:
 - Dimensions and layouts given. Width between 2.1m and 2.6m

- Preferable to angled as minimises accidents and maximises road capacity
- ◆ Angle spaces:
 - Typical layout given. Widths table given based on turnover category and limits on door opening.
 - Layouts for 30°, 45°, 60° and 90° parking spaces. Widths, lengths, manoeuvre space, wheel stop distance, and allowable encroachment into adjacent traffic lanes given in table for each type. Widths of traffic lanes based on the turnover and traffic flow given for each.
- ◆ Centre-of-road parking
 - Unprotected centre-of-road parking should be considered in streets with little through traffic and slow moving traffic
 - Roadway width requirements provided in table based on traffic flow
- ◆ Provision for end clearances (ie no stopping areas on approach to intersections)
- ◆ Provision for pedestrians (provision of wheel stops to prevent encroachment)
- ◆ Protection for through traffic, lighting, locations of unsafe parking areas on-road
- ◆ Provision for special groups:
 - Trucks – loading should allow stopping parallel to the kerb and an appropriate length for the likely design vehicle. Angle parking is almost never practicable given manoeuvre space requirements.
 - Taxis – minimum length for taxi stands given.
 - Motorcycles – angle and parallel dimensions given and diagram. 2.5m by 1.2m is minimum size.
 - Disabled parking – Refers to AS 1428.1. Providing angle parking is more practicable than parallel based on it being hard to provide provision for wheel chairs (parallel spaces must provide 3.2m width by indenting space and providing kerb ramps). Gradients, widths (3.2m minimum), provision of accessible path, and signs requirements (diagrams given).

Note the following is used within the Australian and New Zealand standards:

- ◆ “Shall” indicates a statement is mandatory.
- ◆ “Should” indicates a recommendation.

Criteria		AS/NZS 2890.1 : 2004 Part 1: Off-street car parking	NZS 4121 : 2001 Design for Access and Mobility – Buildings and Associated Facilities	AS 2890.3 : 1993 Part 3: Bicycle parking facilities	AS 2890.2 : 2002 Part 2: Off-street commercial vehicles	AS 2890.5 : 1993 Part 5: On-street parking
Vehicle Crossings	Width (maximum and minimum)	Between 3m and 8m depending on user class, access facility category and road type. Domestic driveways 3.0m.	-	Refer to bullets points above.	Access driveways and circulation roadways widths based on design vehicle and on with and without intervisibility. Two way and one way minimum access width and layout shown in diagrams. Two one-way access driveways required for major service areas.	Refer to bullets points above.
	Number permitted per site	-.	-		Separate access driveway required whether frequency of movements requires so.	
	Maximum total crossing width as a percentage of site frontage	-	-		-	
	Distance between crossings	If one way pair than between 1m and 3m.	-		-	
	Maximum gradients	Details given for ramps with diagrams for both straight and curved, and based on length. Domestic driveways 1 in 4 max.	-		Maximum 1 in 6.5 for all design vehicles (1 in 8 if reverse manoeuvres allowed on ramp).	
	'Level' platform required where access meets road reserve	Max gradient across property line shall be 1 in 20 max for at least 6m. The 6m can be at 1 in 8 m under certain circumstances. Across a footpath shall be 1 in 40 max for at least 1m.	-		Yes, at 1 in 20 for the longest vehicle likely to use the driveway (separate requirement for AVs).	
	Gradient transitions required	Details and diagram on ramp transitions.	-		Yes, rate of change based on design vehicle. Between 1 in 12 in space of 4m and 1 in 16 within 10m. Design vehicle ground clearance templates given.	

Criteria	AS/NZS 2890.1 : 2004 Part 1: Off-street car parking	NZS 4121 : 2001 Design for Access and Mobility – Buildings and Associated Facilities	AS 2890.3 : 1993 Part 3: Bicycle parking facilities	AS 2890.2 : 2002 Part 2: Off-street commercial vehicles	AS 2890.5 : 1993 Part 5: On-street parking
Overhead clearances	Minimum for cars and light vans of 2.2m or 2.5m if allowing for disabled parking spaces. Signs required if <3m for cars and light vans and if <4.6m for all other cases.	Not less than 2.5m for access routes and above parking spaces. At parking space this shall extend from the entrance to space to not less than 2.16m from front of space.		Adequate clearance required for the appropriate design vehicle (0.2m added to this height).	
Areas where crossings cannot be located as of right (eg on identified sites or within a certain distance of intersections involving primary roads as per the 'vehicle access restriction' and the 'defined road boundary' controls in the ex-Auckland City district plans)	Diagram defines dimensions, essentially 6m from corner tangent. Driveways can be within if there is no other option. Distance from signalised intersections considerations given.	-		-	
Sight distance requirement	Table and diagram given. Consideration to pedestrians and vehicles and areas to be free of obstructions.	-		Yes. For both sight distance to public roadway and to pedestrians. Diagrams and table provided. Minimum dimensions for driveway sight splays for pedestrians.	
Reinstatement of crossings no longer required	-	-		-	
Accesses to be properly formed, drained, sealed and delineated	Shall be formed in such a way to be a recognisable driveway or intersection.	-		Yes, as minimum design diagram given for kerbs etc.	
Vehicle tracking curves	Templates given for 85 th and 99 th percentile cars.	-		Turning path templates and reverse entry templates provided for each design vehicle. Clearances of 300mm required.	
Access from multiple road frontages	? n/a	-		-	
Whether reverse manoeuvring onto the road or service lane is permitted	Shall be prohibited wherever possible.	-		Yes, dependant on servicing vehicle requirements/vehicle type (not for "major" road). States that dependant on relevant authority and shall be one movement.	
Provision for vehicle queuing at fuel dispensers, ticket vending machines, etc	Queuing area requirement based on peak hour traffic flow. Table given but more specific.	Figure details height of between 1 and 1.1m and 0.2m distance from kerb for ticket dispensers, kerb-side machines, post boxes etc.		-	
Angle of intersection with road	n/a			-	

Criteria	AS/NZS 2890.1 : 2004 Part 1: Off-street car parking	NZS 4121 : 2001 Design for Access and Mobility – Buildings and Associated Facilities	AS 2890.3 : 1993 Part 3: Bicycle parking facilities	AS 2890.2 : 2002 Part 2: Off-street commercial vehicles	AS 2890.5 : 1993 Part 5: On-street parking
Provisions relating to marking of separate entries and exits	Signs should be where possible in accordance with MOTSAM or AS 1742.2. Whether regulatory signs have legal status in off-street area depends on State laws. The situations when signs are required internally are detailed. Provisions for pavement markings shown in various diagrams.	-		Layout for two one-way driveways given.	
Provisions relating to the removal of street trees, furniture, signs or signals	-	-		-	
Provisions applying to service stations and truck stops	-	-		-	
Parking space dimensions	Widths between 2.1m and 2.7m depending on angle and user class. Lengths between 4.1m and 6m depending of angle and user class. Overhang	90° shall be at least 3.5m Angle parking to have an operational width of 3.5m Parallel parking – the adjacent footpath width can form part of the parking. Must be on the same level. Length shall be at least 5m (refer to AS 2890.1) and for vehicles with rear-mounted hoist a further 1-1.3m is required (AS.NZS 3856.1)	Refer to bullets points above.	-	Refer to bullets points above.
Loading space dimensions	n/a	n/a		Service bay dimensions based on design vehicle. All 3.5m wide and between 6.4m and 19m long, height of 3.5m to 4.5m. Gradient maximum of 1 in 25 in any direction.	
Disabled parking requirements	Refer to AS/NZS 2890.6 (off-street parking for people with disabilities).	<u>Number of car parks:</u> 1-20 - at least 1 21-50 – at least 2 For every additional 50 car parks – at least 1. Specific building types eg medical centres, entertainment centers and large retail facilities should provide greater numbers.	-	-	
Cycle parking requirements	Refer to AS 2890.3.	-		-	

Criteria	AS/NZS 2890.1 : 2004 Part 1: Off-street car parking	NZS 4121 : 2001 Design for Access and Mobility – Buildings and Associated Facilities	AS 2890.3 : 1993 Part 3: Bicycle parking facilities	AS 2890.2 : 2002 Part 2: Off-street commercial vehicles	AS 2890.5 : 1993 Part 5: On-street parking
Minimum design envelope or internal dimensions (free of columns, walls, etc)	Design envelope given.	-		-	
Minimum bus/coach parking, loading and access standards		-		Buses not dealt with. Bus parking within AS 2890.4 Part 4 bus parking.	
Motorcycle parking	Motorcycle spaces 1.2m wide and 2.5m deep.				
Gradients	Max gradients – parallel to space 1 in 20, other direction 1 in 16, disabled spaces see AS/NZS 2890.6 (standard not yet complete). Minimum gradients for drainage – 1 in 100 outdoors or 1 in 200 for covered areas.	Slope of disabled parking space shall not exceed 1 in 50.		Service bay gradient maximum of 1 in 25 (4%) in any direction. Service area shall be 1 in 6.5 (15.4%) where only forward movement is to take place and 1 in 8 (12.5%) where reverse manoeuvres will occur	
Vehicle circulation and tracking curves	If parking aisle exceeds 100m traffic control devices are shall be used. Good practice for circulation aisles for various numbers of parking spaces provided. Aisle widths between 2.9m (30° space) to 6.2m (90°) Blind aisles dealt with ie length and additional space required. Details given for ramps with diagrams for both straight and curved. Details and diagram on ramp transitions.	-		Requirements for manoeuvring and reversing for each design vehicle.	
When stacked parking is acceptable	-	-		-	
Requirement for a kerb or similar barrier where parking or manoeuvring area is adjacent to a road/boundary	Require a barrier whenever there is a drop >600mm (reqs given for barriers eg. > 1.3m high so drivers can see). Between 150mm and 600mm provide wheel stops. Requirements for wheel stops given in table and diagrams between 0.62m (front entry) and 1.1m (rear entry).	-		-	
Loading space location convenient for goods handling/ useable location	-	With regard to disabled spaces, the location shall be on an accessible route to a building and as close as practicable to the accessible entrance or accessible lift		-	

Criteria	AS/NZS 2890.1 : 2004 Part 1: Off-street car parking	NZS 4121 : 2001 Design for Access and Mobility – Buildings and Associated Facilities	AS 2890.3 : 1993 Part 3: Bicycle parking facilities	AS 2890.2 : 2002 Part 2: Off-street commercial vehicles	AS 2890.5 : 1993 Part 5: On-street parking
Provide for lighting of access driveways and pedestrian areas within public parking areas used during the hours of darkness	Shall be adequately lit. Refer to AS 1680.2.1 for minimum lighting levels for roofed areas and AS/NZS 1158.3.1 for open air.	-		-	
Landscape design for parking areas – eg parking areas containing 100 or more parking spaces require landscape dividers or islands to provide separate parking bays	Sight distances should not be compromised. Noted that it is encouraged. Speed hump type and locations.	-		-	
Requirements for parking and loading in areas to be screened from adjacent sites or public places	-			-	
Parking and loading areas to be properly formed, drained, sealed and delineated	-	To be stable, firm, slip resistant flat and surface.		Yes, specific requirements for HRV and AV vehicles.	
Parking/loading space/manoeuvring area permitted between building line designation and road alignment?	-	-		-	
Parking spaces to be kept available and free from deposited or stored goods or materials	-	-		Yes.	
Maximum distances specified for reversing out of parking spaces	Refer to aisle widths based on width of parking spaces.	-		Reversing templates given for design vehicles.	
Multiple parking areas within single site to be connected via internal access	No circulation roadway required if <50 spaces. Guidelines on when parking aisles should not be used as circulation roadways for large parking areas. Width requirements given and passing bays every 30m. Width at entrance requirements based on movements and road type.	-		Yes and to be connected by a roadway that can accommodate the likely design vehicle.	
Other amenity / urban design / CPTED requirements for parking areas (may require assessment via a resource consent)	-	Car parks, drop off points and accessible routes shall be covered whenever practicable. Directional signage to main entrance where not clearly visible.			
Signs and Markings	-	A sign with internationally symbol shall indentify the disabled parking spaces. Shall be visible from the entrance or guide signs shall be provided. The space shall have ground marking of the ISA and may			

Criteria	AS/NZS 2890.1 : 2004 Part 1: Off-street car parking	NZS 4121 : 2001 Design for Access and Mobility – Buildings and Associated Facilities	AS 2890.3 : 1993 Part 3: Bicycle parking facilities	AS 2890.2 : 2002 Part 2: Off-street commercial vehicles	AS 2890.5 : 1993 Part 5: On-street parking
		have additional signage.			
Caravans and Trailers	-	-			
Special Purpose User Parking	Loading/Unloading spaces for prams, bulky parcels dimensions given as 0.5m wider minimum and minimum 2.0m longer.	-			
Pedestrian facilities	Pedestrians should be separate from vehicles entry/exits. Crossing points shall	-			
Mechanical Garages (machines, lifts or elevators for vehicles)	Access to shall be in accordance with driveways and circulation within this standard. Queues and storage to be determined.	-			
Design for enclosed garages	Doorway width minimum 2.4m to 3.0 (diagram given) for single vehicle garage, multi vehicle garage min width of spaces to be 2.4m	-			

REVIEW OF AUSTRROADS GUIDELINES

Austrroads Guide to Traffic Management Part 11: Parking

- ◆ Sections on supply, demand, parking policy not reviewed
- ◆ Section 6 Off-street parking and Section 7 On-street parking reviewed below
- ◆ Provide commentary on small car bays – up to 2006 the trend was towards larger recreational vehicles and family sedans, but post-2006 the trend appears to have reversed in light of fuel pricing and environmental factors. Therefore the proportion of small vehicles is constantly changing and Austrroads recommends to adopt universally sized car bays unless there is strong justification to do otherwise. If adopted small car bays should be used only in remnants of space and should not exceed 15% of total capacity. The bays should be the ‘substandard’ spaces and should be used by staff for example.
- ◆ Payment methods – gives advantages/disadvantages only.

Austrroads Guide to Road Design Part 3: Geometric Design

- ◆ Only section is Section 4.10 On-street parking reviewed below

Austrroads Guide to Road Design Part 6B: Roadside Environment

- ◆ Section 4.4 Off-street parking reviewed below
- ◆ Generally provides few if any specific requirements and refers to AS/NZS 2890.1 and other standards in relation to light, mobility, off-street commercial vehicle facilities, bicycle parking facilities and slip resistance for pedestrian surfaces.
- ◆ Provides general points for designers to consider
- ◆ Provides information in relation to off-street parking areas within the road reserve (between kerb and property boundaries) so generally relates to service areas. Therefore parking for large vehicles relates to semi-trailers for example.

Austrroads Part 4: Intersections and Crossings – General

- ◆ Provides design vehicles including swept paths, however more detailed information on design vehicles is contained within Austroads Design Vehicle and Turning Path Templates (Austroads 2006a).
- ◆ Section 7 Property access and median openings and Appendix A Access spacing

Criteria		Austroads Traffic Management Part 11: Parking	Austroads Road Design Part 3: Geometric Design	Austroads Part 4: Intersections and Crossings - General	Austroads Part 6B: Roadside Environment	
Vehicle Crossings	Width (maximum and minimum)	Requires “comprehensive car park analysis” and refers to AS/NZS 2890.1. Provides points to consider with regard to driveways eg. location, sufficient queuing areas etc	-	-	Type of layout and driveway width to be determined by analysis or refer to AS/NZS 2890.1 if flow data etc is not available.	
	Number permitted per site		Crash rates given for number of unsignalised access points per km. Shows an increase in rate with increase in number of access points.	-	Refer to AS/NZS 2890.1	
	Maximum total crossing width as a percentage of site frontage		-	-	-	
	Distance between crossings		-	-	Location refer to Clause 3.2.3 of AS/NZS 2890.1 and Section 6.1 of Austroads (2008c)	
	Maximum gradients		-	-	-	
	‘Level’ platform required where access meets road reserve		Maximum crossfall of general footpath to be 2.5%, min width of 1.2m.	-	-	
	Gradient transitions required		-	-	-	
	Overhead clearances		Internal clearances refer to AS/NZS 2890.1.	-	-	-
	Areas where crossings cannot be located as of right (eg on identified sites or within a certain distance of intersections involving primary roads as per the 'vehicle access restriction' and the 'defined road boundary' controls in the ex-Auckland City district plans)		-	-	Defines ‘functional’ area, ‘left-turn conflict’ overlap and influence distance. Considerable information presented in Appendix A. Provides summary table of spacing assessments.	-
	Sight distance requirement		“Adequate sight distance to street traffic”	Considerable information provided.	-	-
	Reinstatement of crossings no longer required	-	-	-	-	
	Accesses to be properly formed, drained, sealed and delineated	-	-	-	-	
	Vehicle tracking curves	-	-	-	-	
Access from multiple road frontages	-	-	-	-		
Whether reverse manoeuvring	-	-	-	-		

Criteria	Austrroads Traffic Management Part 11: Parking	Austrroads Road Design Part 3: Geometric Design	Austrroads Part 4: Intersections and Crossings - General	Austrroads Part 6B: Roadside Environment
onto the road or service lane is permitted				
Provision for vehicle queuing at fuel dispensers, ticket vending machines, etc	No specific dimensions, but require adequate queuing distance to prevent queuing off site.	-	-	-
Angle of intersection with road	-		-	-
Provisions relating to marking of separate entries and exits	Should be in accordance with MOTSAM	-	-	-
Provisions relating to the removal of street trees, furniture, signs or signals	-	-	-	-
Provisions applying to service stations and truck stops	-	-	-	-
Parking space dimensions	Should be in accordance with AS/NZS 2890.1-2004 Part 1: Off street car parking.	Widths between 2.1m and 2.6m (trucks, buses) for parallel, 30°, 45°, 60°, 90° angled spaces based on category use. Lengths between 4.4m and 6m (trucks, buses) for parallel, 30°, 45°, 60°, 90° angled spaces based on category use. Category use either low, medium or high.	-	Refer to AS/NZS 2890.1, AS 2890.2 and AS 2890.3 for design guidance on off-street parking
Loading space dimensions				
Disabled parking requirements	Should be in accordance with AS/NZS 2890.6 (in preparation) ..(prep?) and NZS 4121-2001. (deals with location, and markings? AS 1428.1 does and AS/NZS 1158.3.1 deals with lighting.)	Width 3.2m and length between 4.4m and 5.4m for differing angles.	-	-
Cycle parking requirements	Should be in accordance with AS 2890.3 – 1993 Parking facilities Part 3: Bicycle parking facilities, Transit NZ (2003) and Austrroads (1999) as appropriate. Lists general requirements eg should be within 100m of common commuting and recreational destinations.	-	-	Refer to AS 2890.3 for categories of parking and design guidance.
Minimum design envelope or internal dimensions (free of columns, walls, etc)	Clearances given in Section 5 AS/NZS 2890.1	-	-	-
Minimum bus/coach parking, loading and access standards	Truck parking design set out in AS 2890.2-2002 Part 2: Off-street commercial vehicle facilities. Buses may generally be treated in same manner as truck parking.	-	-	-
Motorcycle parking	Motorcycle parking refer to AS 2890.1.	On road motorcycle spaces 1.2m min width and 2.5m min length (which is the same as off street space dimensions)		Motorcycle parking refer to AS 2890.1.

Criteria	Austrroads Traffic Management Part 11: Parking	Austrroads Road Design Part 3: Geometric Design	Austrroads Part 4: Intersections and Crossings - General	Austrroads Part 6B: Roadside Environment
Gradients	Should be in accordance with AS/NZS 2890.1-2004 Part 1: Off street car parking.	-	-	-
Vehicle circulation and tracking curves	-	-	-	-
When stacked parking is acceptable	-	-	-	-
Requirement for a kerb or similar barrier where parking or manoeuvring area is adjacent to a road/boundary	-	Wheel stops to prevent angle parked vehicles intruding on narrow footpaths (less than 2m wide)	-	-
Loading space location convenient for goods handling/ useable location	-	-	-	-
Provide for lighting of access driveways and pedestrian areas within public parking areas used during the hours of darkness	Refers to AS/NZS 2890.1 or open-air car parks AS/NZ 1158.3.1	-	-	-
Landscape design for parking areas – eg parking areas containing 100 or more parking spaces require landscape dividers or islands to provide separate parking bays	-	-	-	-
Requirements for parking and loading in areas to be screened from adjacent sites or public places	-	-	-	-
Parking and loading areas to be properly formed, drained, sealed and delineated	-	-	-	-
Parking/loading space/manoeuvring area permitted between building line designation and road alignment?	-	-	-	-
Parking spaces to be kept available and free from deposited or stored goods or materials	-	-	-	-
Maximum distances specified for reversing out of parking spaces	-	-	-	-

Criteria		Austrroads Traffic Management Part 11: Parking	Austrroads Road Design Part 3: Geometric Design	Austrroads Part 4: Intersections and Crossings - General	Austrroads Part 6B: Roadside Environment
	Multiple parking areas within single site to be connected via internal access		-	-	-
	Other amenity / urban design / CPTED requirements for parking areas (may require assessment via a resource consent)	Gives general design principles for urban design (refers to Section 5?). Overall design consistent with CPTED.	-	-	-
Other Matters	Signs and Markings	Signs should be in accordance with MOTSAM 1, markings in accordance with MOTSAM 2.	-	-	-
	Caravans and Trailers	To be designed for specific needs of its user, but can generally be treated in a similar manner as truck parking with regards to swept paths, circulation, and access.	-	-	-
	Special Purpose User Parking	For example, “parents-with-pram” parking should be a min of 0.5m wider than standard dimension space. These parks are not enforceable.	-	-	-
	Pedestrian facilities	Refer to Austrroads Part 8: Local Area Traffic Management for pedestrian facility planning. Lifts for parking structures > 3 levels, protected pedestrian paths to parking spaces.	-	-	-
	Mechanical Garages (machines, lifts or elevators for vehicles)	Driveways and circulation in accordance with AS/NZS 2890.1. Sufficient storage required for queuing vehicles to prevent queuing beyond property boundary.	-	-	-
	Design for enclosed garages	-	-	-	-

APPENDIX C

Overseas Examples

AUSTRALIAN REQUIREMENTS

Sydney

Typically Development Control Plans (DCP) are used for determining the requirements of access, parking and loading.

For example:

- ◆ City of Sydney DCP – Section with regard to on-site parking is only five pages and pedestrian amenity section (which details vehicle crossings) is nine brief pages. This is for the existing Plan there is however a Draft City plan 2010 which is reviewed below
- ◆ City of Ryde DCP, one section sets out parking requirements. This is a very simple nine page document which predominantly outlines the number of parking spaces required and refers to AS 2890.1 (off-street parking) and AS 2890.2 (off-street commercial parking). Separate section on driveways which details all the technical material for accesses.

Interesting points (City of Sydney Draft DCP, 2010):

- ◆ Vehicle access points are restricted in places of high pedestrian activity identified on the pedestrian priority map
- ◆ Vehicular access is to be designed to give priority to pedestrians and bikes by continuing the type of footpath material and grade.
- ◆ Where possible adjoining developments should share/amalgamate vehicle entry/exit points
- ◆ Within the Central Sydney Planning Area, non residential car parking at ground level or above, as well as ramps, are not to be visible from the public domain
- ◆ Car parking areas “are to be subordinate in appearance to the main building”
- ◆ Ground level car parking is to be “designed with materials, details, proportions and landscaping to complement the building and adjoining buildings”
- ◆ Within the Central Sydney Planning Area, public car parking is not to be accessible to vehicles between 5:30 and 9:30 am Monday to Friday. Between 9:30 am and 6:00 pm, a fee structure is to be put in place that discourages stays of over four hours.

Melbourne

Melbourne – City of Melbourne Planning Schemes are used.

- ◆ Similar to DCPs, with relatively short sections separately on parking, loading and cycle requirements.
- ◆ Separate parts of the scheme are updated at different times. Parking area in 2008 and the loading and cycling both in 2006.

The Plan provides an outline of the ‘purpose’ of the parking section, which include ensuring parking:

- ◆ Does not adversely affect the amenity of the locality, in particular the amenity of pedestrians and other road users.
- ◆ Achieves a high standard of urban design

Brisbane

Brisbane City Plan – Transport, Access, Parking and Servicing provides a table of the required design vehicle for the development type. Three categories are:

- ◆ “Occasional access” - Design vehicle swept path for occasional does not have a greater overall width than the access driveway.
- ◆ “Major road” – required to enter and leave the site in a forward direction, be able to traverse the site and manoeuvre on-site into parking or loading areas
- ◆ “Minor road” - Where site access is via a minor road, on-site manoeuvring and full loading bay provision for the largest design vehicle is not essential. The vehicle can be contained within the site without blocking more than 50% of parking spaces or occupying queuing areas, the swept path may cover the overall width of a two-way undivided driveway, reversing off the site to be in one movement only. .

The number of loading bays required is also detailed in terms of design vehicles and development type and size.

Pros:

- ◆ Brisbane plan sets out various requirements eg gradients in easy to read tables.
- ◆ Gradients, aisles, clearance, length and widths of spaces are all based on vehicle types (van, car, SRV, MRV, RCV, coach, AV)
- ◆ Service bays

Interesting points:

- ◆ A minimum of 40% of the total site parking requirement, including all public and visitor parking "spaces, are to be clearly visible from the street"
- ◆ Shade trees to be provided for at-grade parking areas to achieve coverage within 10 years - the ratio of 1 tree for every 6 carparking spaces (only desirable design principle).

Criteria	Central Sydney DCP		Brisbane City Plan – Transport, Access, Parking and Servicing	City of Melbourne	
	Former DCP	Draft DCP 2010			
Vehicle Crossings	Width (maximum and minimum)	Wherever practicable, vehicle access is to be a single crossing with a nominal width of 2.7 metres over the footpath, and perpendicular to the kerb. In exceptional circumstances, a double crossing with a nominal width of 5.4 metres may be permitted for safety reasons. Separate requirements for service vehicles (Waste Handling in Buildings).	Maximum width 3.3m over the footpath where possible	Seven types of standard driveways are shown between 3.5m and 9m based on vehicle types.	Accessways at least 3m wide. Requirements for internal radius of corners. Driveway for loading to be at least 3.6m wide.
	Number permitted per site	Location to be in accordance with 2890.1.		One per development, but can be relaxed where the safety and traffic operation on the road are compromised and pedestrian safety is improved.	
	Maximum total crossing width as a percentage of site frontage			-	
	Distance between crossings		Minimum 2m for developments over 1000m ² GFA	-	
	Maximum gradients			Table provided and depends on design vehicle - between 1 in 6 for van to 1 in 25 (queuing area).	
	'Level' platform required where access meets road reserve			1 in 20 for circulation road, ramp or driveway within 6m of a property boundary, traffic control point or marked pedestrian crossing.	Yes, 6m.
	Gradient transitions required			Yes. Diagrams and examples given. Changes of surface gradient are not to exceed an algebraic change of more than 5% (1:20) or a transition to be provided.	-
	Overhead clearances			Minimum 4.5m for refuse truck.	

Criteria	Central Sydney DCP		Brisbane City Plan – Transport, Access, Parking and Servicing	City of Melbourne
	Former DCP	Draft DCP 2010		
Areas where crossings cannot be located as of right (eg on identified sites or within a certain distance of intersections involving primary roads as per the 'vehicle access restriction' and the 'defined road boundary' controls in the ex-Auckland City district plans)		Multiple, complicated restrictions for developments over 1000m ² GFA Restricted in places of high pedestrian activity	-	
Sight distance requirement			Access sight distance table given for speed and driveway use. Same for service vehicles because of increased conspicuity and driver eye height. Requirements for pedestrian/vehicle and vehicle/vehicle conflict points. Internally often requires splayed corners and requires 2.5s of travel time for sight distances.	
Reinstatement of crossings no longer required			-	
Accesses to be properly formed, drained, sealed and delineated			Yes, driveways to be constructed in accordance with figure shown.	
Vehicle tracking curves			Design vehicle and development type table given.	No tracking curves given. Must consider type and size of vehicle likely to use the parking area. Assume that this comes from AS2890.1.
Access from multiple road frontages		Direct access from arterial or sub-arterial not permitted where an alternative can be provided. Where rear lane exists, parking shall be access from this lane only	-	
Whether reverse manoeuvring onto the road or service lane is permitted		No reverse manoeuvres permitted across footpaths, except for dwelling houses.	Yes for "occasional"	-
Provision for vehicle queuing at fuel dispensers, ticket vending machines, etc		Queuing not to extend across footpaths	Yes. Not to queue across footpath or onto external roads and to be within property boundary (min one vehicle length, 6m). In absence of site specific data a table of minimum queuing provisions is provided, eg. 1-25 spaces reqs. space for one vehicle. Further details given on specific cases.	-
Angle of intersection with road		Perpendicular to the kerb where possible	-	-
Provisions relating to marking of separate entries and exits			Signs and markings to be provided internally and at access points only under specific circumstances.	-
Provisions relating to the removal of street trees, furniture, signs or signals		Parking and driveways to be designed so as to minimise impact on existing street trees, and to maximise opportunities for new plantings.	-	Refer to design and construction standards.

Criteria	Central Sydney DCP		Brisbane City Plan – Transport, Access, Parking and Servicing	City of Melbourne
	Former DCP	Draft DCP 2010		
Provisions applying to service stations and truck stops			-	-
Parking space dimensions			Between 2.4m and 3.2m depending on user type. Five classes which are very similar to AS/NZS 2809.1 user classes. Wheel stops can be used – located 0.5m from the end. Parallel length of between 5.4m (one open end) and 6.6m (both ends closed)	Dimensions given between 2.3m wide and 3.2m and 4.9m long and 6.7m long for different angles. Must generally be in accordance with AS2890.1. But “a permit may be granted to vary any dimension or requirement of [the parking clause]”.
Loading space dimensions			-	7.6m long, 3.6m wide, height 4m and area of 27.4 sqm. For additional 1,800 sqm or part additional 18 sqm required.
Disabled parking requirements	From Access DCP ie for disabilities. States relevant standards are AS 2890.1, also AS 1428.1 and 1428.2 (building requirements). But then details requirements. Minimum of 3.8m, overlap allowance of 0.5m to adjoining walkway etc. Vertical clearance of at least 2.5m and min length of 5.5m. Typical requirements regarding location, cover and signage. Not required when access to parking area is not available to the general public. Not required when there are a total of 5 or less spaces. However other DCP for on-site parking states minimum of 1-2% of parking spaces and appropriately designed in accordance with AS 2890.1.	Accessible parking spaces to be included in the allocation of car parking for the development. Not required when access to parking area is not available to the general public.	In accordance with the requirements of Australian Standards AS1428 and AS2890.1 (1993 deals with this). 1 space per 100 ordinary spaces except for business (1/4,500 sqm gfa), banks (one) and restaurants (1/300sqm gfa).	Yes.
Cycle parking requirements	Facilities for cyclist are to be provided in all buildings that provide on-site parking. Facilities include parking for bicycles and at least one readily accessible shower change room. Bicycle parking <u>space</u> should equal at least one car parking space for every 100 car parking spaces or part thereof. Motorcycles - Motorcycle parking is to be provided in all buildings that provide on-site car parking, and is to be equal to at least one car parking space for every 100 car parking spaces	Bicycle parking facilities are to be additional to other parking requirements, and are to be designed to relevant Australian standards (standards not listed) Motorcycle parking spaces are to be included in the allocation of car parking spaces.	-	Refers to AS 2890.3 1993 for bicycle parking. Basic dimensions of 1.7m long, 1.2m high and 0.7m width at handlebars. Other details provided on cycle requirements. Refer to Austroads Part 14 – Bicycles.

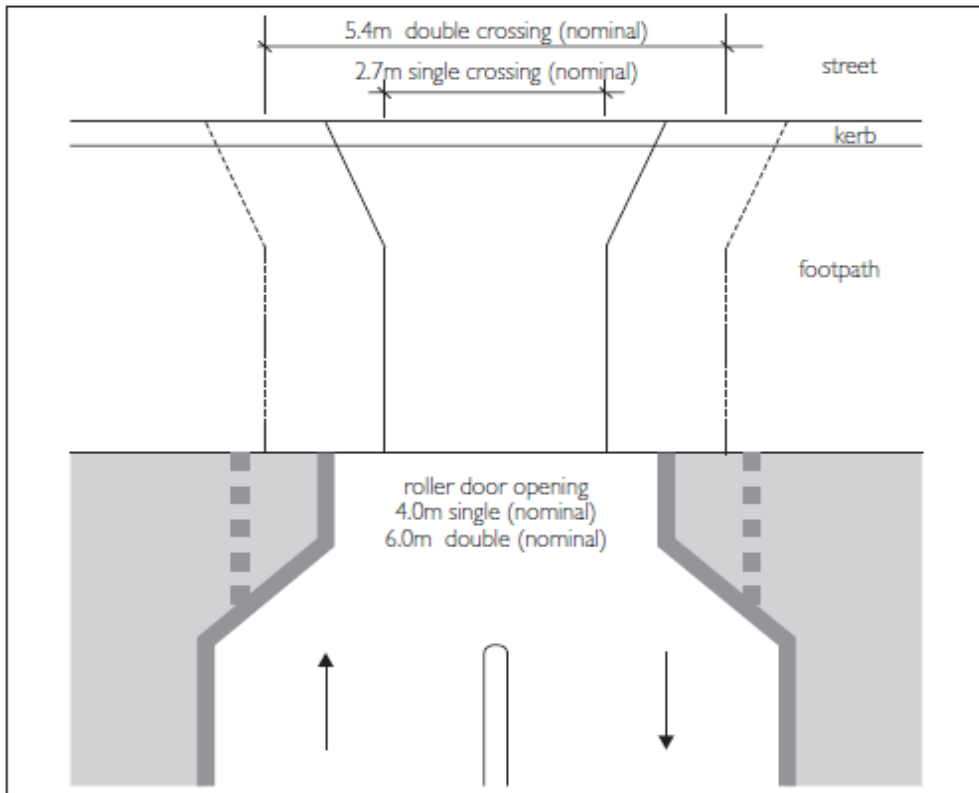
Criteria	Central Sydney DCP		Brisbane City Plan – Transport, Access, Parking and Servicing	City of Melbourne
	Former DCP	Draft DCP 2010		
	or part thereof.			
Minimum design envelope or internal dimensions (free of columns, walls, etc)			Design envelope given which is similar to AS/NZS 2890.1. Blind aisle treatments are 8m behind space or 2m at end of aisle.	-
Minimum bus/coach parking, loading and access standards	No dimensions given.	No dimensions given.	Yes and provided in table form.	Provides minimal requirements for loading.
Gradients			Refers to AS2890.1 but also provides table with details of gradients for parking spaces, ramps, circulation roads, queue areas, and super-elevation on roadway camber. Spaces, circulation and aisles between 1 in 15 and 1 in 10 (1 in 40 for disabled). Ramps between 1 in 6 and 1 in 20 (adjacent to property boundary)	-
Vehicle circulation and tracking curves			Tracking curves for cars (differentiated into small, medium or large car) and service vehicles. These are based on AS2890.1. Typical layouts for parking areas given eg small retail or industrial parking areas. Minimum radius curbs given for the number of vehicles, between 1m and 3m. No need to cross the centre line if >50 parking spaces are served. Table of widths for circulation roads given between 3m and 7.5m. Maximum aisle length is 100m.	Widths given. Road to loading bay to be at least 3.6m. No tracking curves given.
When stacked parking is acceptable	Yes for residential buildings and serviced apartments.	Yes, for residential building/apartment tenants or commercial/retail development staff	-	-
Requirement for a kerb or similar barrier where parking or manoeuvring area is adjacent to a road/boundary			-	-
Loading space location convenient for goods handling/ useable location		Located near vehicle entry points, near lifts and completely on site.	Yes.	-
Provide for lighting of access driveways and pedestrian areas within public parking areas used during the hours of darkness		Non residential parking areas to be well lit	Yes and avoid abrupt changes in lighting levels during both day and night operation.	-

Criteria	Central Sydney DCP		Brisbane City Plan – Transport, Access, Parking and Servicing	City of Melbourne
	Former DCP	Draft DCP 2010		
Landscape design for parking areas – eg parking areas containing 100 or more parking spaces require landscape dividers or islands to provide separate parking bays			Shade trees to be provided where at-grade parking areas are necessary or unavoidable to achieve coverage within 10 years - the ratio of 1 tree for every 6 carparking spaces (only desirable design principle).	-
Requirements for parking and loading in areas to be screened from adjacent sites or public places	Yes	Non residential parking at ground level and above is not to be visible from the public domain, nor shall vehicle access ramps.	No. “A minimum of 40% of the total site parking requirement, including all public and visitor carparking” spaces, is to be clearly visible from the street”	Yes, no details.
Parking and loading areas to be properly formed, drained, sealed and delineated			Adequately signed and delineated.	-
Parking/loading space/manoeuvring area permitted between building line designation and road alignment?			-	-
Parking spaces to be kept available and free from deposited or stored goods or materials			Yes and away from heavy vehicle manoeuvring areas.	-
Maximum distances specified for reversing out of parking spaces			No maximum given but no reversing is to occur in areas of high pedestrian activity.	-
Multiple parking areas within single site to be connected via internal access			Internal access road minimum distances given based on low turnover.	-
Other amenity / urban design / CPTED requirements for parking areas (may require assessment via a resource consent)			Desirable design principles given with regard to providing a clearly defined pedestrian network.	-
Signs and Markings				Refer to design and construction standards.
Caravans and Trailers			-	
Special Purpose User Parking			-	
Pedestrian facilities			-	
Mechanical Garages (machines, lifts or elevators for vehicles)			-	
Design for enclosed garages			Min internal dimensions 6m by 3m and min doorway opening of 2.4m (altered in there is insufficient manoeuvring space in front).	

Figure 20: Brisbane City Plan – Transport, Access, Parking and Servicing – Design Vehicle for Development Type (part of table only)

Column 1	Design vehicle (Refer Section 7, Table 19)		
	Column 2	Column 3	Column 4
Development type ⁽¹⁾	Occasional access	Regular access	
		Major road	Minor road
Caravan park	AV	RCV	MRV
Carpark	MRV	SRV	SRV
Cemetery	MRV	MRV	MRV
Child care facility	VAN	VAN	VAN
Community facilities	RCV	RCV	MRV
Hall			
if music/concert	RCV	RCV	LRV
otherwise	RCV	RCV	SRV
Hospital	RCV	RCV	LRV
Youth club	COACH	SRV	VAN
Display and sales activities	AV	AV	AV

Figure 21: Vehicle Access and Footpath Crossings : City of Sydney DCP



Vehicle access points are to be minimised in width and perpendicular to the street.

Reference: S:\ACUP\002\Review Australian Plans.docx - Karl Hancock

APPENDIX D

Vehicle Access – Workshop Feedback

SUMMARY OF WORKSHOP FEEDBACK – VEHICLE ACCESS

Issues	Defined Road Boundary	Width	Number of Crossing per Site	Gradients	Level Platform	Other
<ul style="list-style-type: none"> Jointly owned access lots and subdivision layout Industrial access/commercial/business Overlap for subdivision and resource consent standards Rodney plan is all over the place, some transport rules are in rural, some in subdivision, general rule Clarity - encourage applicants to submit parking plan, gradient plan - all goes to one place in the plan for requirements rather than cross referencing everything 	<ul style="list-style-type: none"> The wording should be changed, but the idea should be kept. Should be based on road type (30m/90m for arterial/arterial and 30m/15m for arterial/local). And type of intersection eg signals, roundabout. Consider rear lane access for arterials 	<ul style="list-style-type: none"> Residential width of 2.75m is not ever seen Typically 3.5m in/out and residential double garage of 5.5m Smaller width works better. 5.5m is too wide. Suggest that 9m for commercial is too wide Pedestrian connectivity across big crossings Rule for pedestrian refuge if crossing exceeds a certain width 	<ul style="list-style-type: none"> The number ties in with the width of access Suggest number of crossings for commercial should be two small rather one large crossing. Suggest sharing of driveways (eg residential subdivisions) rather than two crossings 	<ul style="list-style-type: none"> It is important to have these included Consider camber as well as gradient Standards need to incorporate considerations of pedestrian user 	<ul style="list-style-type: none"> Trade off between platform step and visibility. Should have a level platform. With a steep gradient or no platform then visibility for pedestrians is a problem and there should be reverse manoeuvring (or no parking) requirements. 	<ul style="list-style-type: none"> Reverse manoeuvring should be based on classification of road Consider passing bay locations (refer to NSCC)
<ul style="list-style-type: none"> Conflict between where AT and AC powers begin and finish? Potential for conflict that AC will approve a new crossing and AT will not allow it Approvals under LGA s348 (ROW) and then not implemented but 2nd dwelling constructed so no legal access (see Rural Delivery for detail) Change of use an issue, might not be able to put condition on a RC to require AT approval for use of existing access 	<ul style="list-style-type: none"> Access restrictions near intersections. Engagement with Auckland Transport vs prescriptive rule 	<ul style="list-style-type: none"> Needs to be fit for purpose. Must fit associated tracking curve Wide crossings can impact on stormwater controls also lighting/landscaping 	<ul style="list-style-type: none"> Promotion of shared access for multiple rear lots Promote shallower subdivision blocks to reduce lots of rear sites Promote one per site or one per amalgamated sites/driveways 	<ul style="list-style-type: none"> Is a platform beneficial? Vertical and horizontal issue, sight distance improved. If topography is sloped, then can limit speed on vehicles exiting In some cases textured surfaces (high friction) is appropriate for safety in some areas eg bush clad site or greater than 1 in 4. 	<ul style="list-style-type: none"> "Clearance envelopes" for access- tie back to residential rules about structures Platform is site specific e.g. depends on pedestrian usage etc. if necessary then don't over design and have a 6m deep one. 	<ul style="list-style-type: none"> Fencing along front yard, can limit visibility Impact on private open space
<ul style="list-style-type: none"> Objectives of access: pedestrian safety, avoiding damage to property (internal/external) 		<ul style="list-style-type: none"> Widths - hierarchical or actual need? Performance based criteria vs zone approach 	<ul style="list-style-type: none"> How many residential dwelling do you want to be served by one driveway? 4 or 5? Before this becomes a 	<ul style="list-style-type: none"> Gradients need to be tied in with government standards. 1:5 is linked to handbrake strength NZCI crash report 	<ul style="list-style-type: none"> What if there is a gate at top? Car then parks on slope anyway. Reversing, platform and gradients more 	<ul style="list-style-type: none"> Visitor car parks are not required in Rodney, therefore creates spill over effect for on street car parks

Issues	Defined Road Boundary	Width	Number of Crossing per Site	Gradients	Level Platform	Other
<ul style="list-style-type: none"> · Tie engineering approvals as standard resource consent condition 		<ul style="list-style-type: none"> · Footpath design critical (should have primary right) may be possible to have wide access with good design · Topography and other variables mean difficult to get standard approach 	<ul style="list-style-type: none"> · road? (recommendation for 3) · Consider combined driveways and revalue the percentage of driveways on road frontage (Isthmus only) 	<ul style="list-style-type: none"> · Stormwater controls on steep sites · Appropriate surfaces for grades and use 	<ul style="list-style-type: none"> · important 	<ul style="list-style-type: none"> · Shared space concept for small residential developments · Tree species for street trees - visibility · Assessment criteria for ROW, driveways etc. · Information requirements (i.e. clear and concise- i.e. parking plan, gradient plans etc) · Single length issue/passing bay, fire hydrants?
<ul style="list-style-type: none"> · Safety · Reversing out of site and reversing on site · Visibility splays? fencing, hedging · Manual for street- approach · Consider road hierarchy. Reversing onto local or collector ok. · Regional consistency vs local variance · Subdivision standards 		<ul style="list-style-type: none"> · Width of driveway needs to be land use and road hierarchy specific (getting traffic off road vs high pedestrian area) 	<ul style="list-style-type: none"> · If site doesn't have parking, can't create parking and new vehicle crossing if heritage/character area (e.g. Herne Bay, Ponsonby, Parnell) 	<ul style="list-style-type: none"> · Different vehicle requirements eg emergency vehicles 	<ul style="list-style-type: none"> · Materials should be consistent 	<ul style="list-style-type: none"> · Access restrictions for sites with high traffic generation (e.g. WCC plan >20 and >50 vehs per day). Should restrict quantity of activity rather than location of access.
<ul style="list-style-type: none"> · Quay Street - good example of conflict, who has right of way. Pedestrians or vehicles crossing 		<ul style="list-style-type: none"> · Design for use · Minimum splays 	<ul style="list-style-type: none"> · Large (wide) driveways should be split into defined entry and exit with defined pedestrian refuge · Encourage shared use for rear sites rather than multiple driveways (poor visual outcome) 	<ul style="list-style-type: none"> · Gradient is more important than surface 	<ul style="list-style-type: none"> · Speed bump which forces vehicles to slow down just before interface also has the same effect using engineering standards. · Car crossing footpath (give priority in city to pedestrians) and want to encourage pedestrian flow 	<ul style="list-style-type: none"> · Passing bays and emergency vehicle access requirements for rear sites · Permeable paving. Strip driveways don't work? · Pedestrian path for rear sites over certain number of houses. Urban design and engineering conflicts need to be settled · Consider lighting · A rule is needed regarding the information required to demonstrate compliance with standards

Issues	Defined Road Boundary	Width	Number of Crossing per Site	Gradients	Level Platform	Other
		<ul style="list-style-type: none"> Different treatments for high or low volume vehicle entrances 	<ul style="list-style-type: none"> Residential only need one, exception for corner site Non residential have different requirements In WCC a second crossing is a restricted discretionary 			<ul style="list-style-type: none"> Driveway length and passing bays Review hierarchy
			<ul style="list-style-type: none"> Principle should be to reduce number of driveways onto the road space where possible Removing redundant driveways should be a cost to the developer. Need to revisit restrictions, maybe future proofing (issues with changes in network hierarchy). 			<ul style="list-style-type: none"> Focus on vehicle speed, making tighter and harder to speed -increase the risk-volume/number At what point does the car have priority. Vehicle entrance only based on number of carparks, vehicle movements, or also a pedestrian entrance which could be separate. Flexibility to argue case

Issues	Defined Road Boundary	Width	Number of Crossing per Site	Gradients	Level Platform	Other
<ul style="list-style-type: none"> Lack of provision of pedestrian access through parking areas Provision for development/financial contributions to pay for parking buildings 	<ul style="list-style-type: none"> Requirement for resource consent for access within a defined road boundary where approval would be given for provision of on-site manoeuvring 					

Reference: S:\ACUP\002\Workshop\Feedback recieved\Summary of Workshop - Vehicle Access Appendix E.docx - Karl Hancock

APPENDIX E Parking and Loading – Workshop Feedback

SUMMARY OF WORKSHOP FEEDBACK – PARKING AND LOADING

Standards	Issues	Landscaping / Urban Design	Parking Dimensions	Disabled	Loading	Bicycle and Motorcycle Parking	Other
<ul style="list-style-type: none"> · Making people comply with standards which aren't readily available. Who designs carparks? Does the ordinary user with one or two parks need to refer to them? · How often do standards get updated? Will we lock ourselves into an old approach and not be innovative by relying on standards 	<ul style="list-style-type: none"> · Wide variety of vehicles sizes · Outcomes can change - safety, pedestrian amenity slower traffic environments can have different standards. · Be clear about the outcomes 	<ul style="list-style-type: none"> · Location of parking - considered in a more strategic way · Negative contribution to the streetscape · Try and change model eg supermarket. Developers need to move parking from front to the back 	<ul style="list-style-type: none"> · Provided for smaller cars - some parks could be smaller e.g. top floor of Deloitte's building in town e.g for car fleet of smaller cars 	<ul style="list-style-type: none"> · Align with Building Act? · Location important - practical & access · Not practical for certain activities i.e. hospital/health centres/ community facility · Design an unimpaired access from car to destination on site 	<ul style="list-style-type: none"> · Issues with protecting streetscape · Loading on street can result in operational issues and is dependent on who the planner is with regard to notifying this. · Flexibility provision should be enabled on a case by case basis. · However needs to be balanced against congestion 	<ul style="list-style-type: none"> · Cycle parking needs to be secure. Different cycle parking requirements for workers and customers · Need motorbike parking dimensions 	<ul style="list-style-type: none"> · Valet services- innovative -less space needed. · Mobility scooters- do they need parking - what are the access requirements e.g. ramps, gradient. · In St Heliers there is mobility scooter and motorbike parking on a redundant vehicle crossing
<ul style="list-style-type: none"> · Assumption that the NZ standard for parking works? 	<ul style="list-style-type: none"> · How much discretion should be built into the UP? · Consider safety · Consider tradeoffs in special circumstances 	<ul style="list-style-type: none"> · Consider screening by uses · Recognition of character and context e.g. town centres need different treatment than rural area 	<ul style="list-style-type: none"> · Should differentiate between parking types eg short term, employee · Lighting, CCTV, wardens should be considered 	<ul style="list-style-type: none"> · AT provides some disabled parking on street. Businesses may not need specific onsite ones in those circumstances. · Disability parks- blue surfacing of parks supported by disability groups. Urban design issue? 	<ul style="list-style-type: none"> · AT could provide loading as public/shared space, ie amalgamating parking and loading for small business in one area · On-street loading spaces in the city centre (when providing one per site) are not used much during the day and are unsightly · Lack of flexibility and opportunity for sharing · Could be more flexible with the standards? Try and build it into the rules rather than relying on resource consents. Especially in central area. 	<ul style="list-style-type: none"> · Different types of cycle parking required. · Consider screening, CPTED, lighting. Are all these in scope of standard? · The impact of requirement for parking on GFA. 	
<ul style="list-style-type: none"> · In plan they are difficult to update and have more weight. · Out of plan and there is more flexibility and less 	<ul style="list-style-type: none"> · Standards need to be future proof · Parking technology eg stacking. There is an issue with queuing at 	<ul style="list-style-type: none"> · Focused on ease of access for vehicle speed. Poor pedestrian amenity and visual amenity · Emphasis on amenity in 		<ul style="list-style-type: none"> · Accessibility to facilities is important 	<ul style="list-style-type: none"> · Loading for residential to be considered · Loading should be outcomes driven · Not only size of bay also 	<ul style="list-style-type: none"> · Bike/motorcycle parks (staff/visitor/mobility differentiation) · Facilities (bonus) - shower, lockers 	

Standards	Issues	Landscaping / Urban Design	Parking Dimensions	Disabled	Loading	Bicycle and Motorcycle Parking	Other
<p>weight.</p> <ul style="list-style-type: none"> Linking standards to Unitary Plan means many more plan changes each time standard changes Need to be understood by customers and monitoring officers 	<p>Ironbank.</p>	<p>Auckland Plan - existing standards need work to achieve that. Urban design and landscaping more necessary</p> <ul style="list-style-type: none"> Difficult though – how prescriptive do we need to be 			<ul style="list-style-type: none"> need to link to access i.e. wider bay allows for extra manoeuvring Loading in town centres (how many and size)? Headroom 4.25m too high? Road freight distribution- check with national policy- bigger trucks that are now permitted. 	<ul style="list-style-type: none"> Easy access, safe access for pedestrian 	
<ul style="list-style-type: none"> How can Unitary Plan give guidance on how to use engineering standards Standards need to be Unitary Plan as engineering standards only apply for public works or shared driveways Need to be explicit what is meant. Tracking curve and aisle. What is 90 vs 99%? Rules linking to multiple standards? Referring to whole standards not very user friendly. Tables are. 	<ul style="list-style-type: none"> Green building standards- NZ green building council -smaller spaces- sustainability (see WCC) There is an overlap between District Plan and the Building Act How do we bring existing parking areas up to standard. 	<ul style="list-style-type: none"> Landscaping results in leaf fall but also shading Low impact design- incorporate into standard? Underground incentives beyond the CBD perhaps? Parking off ground floor e.g. Sylvia Park- good for run off and storm water. Less surface parking at ground level - incentivise or require - bonus, allowance for height for above ground parking. 	<ul style="list-style-type: none"> Increase width -less space for manoeuvring however this is in conflict with green building code Vertical clearance, vehicle transitions and entrance gradients are key issues Redraw tracking curves so 300 (10km less), 600 (10km more). Reverse tracking - new template? Side by side vehicle envelopes 		<ul style="list-style-type: none"> Change through transition – within AS2890 is ok for cars but not for trucks. Width: space for vehicles and what happens on the edge of bay (side loading) Range of loading and sizes- types of land uses 	<ul style="list-style-type: none"> Opportunity to provide cycle park instead of providing carparks 	
<ul style="list-style-type: none"> District plans = requirements, Codes = recommendations Standards and details are hard to understand. Open to interpretation. If detailed then loses flexibility Change the code of practice becomes an issue 	<ul style="list-style-type: none"> Lack of car parks- forces developments in the outer area Alternative use for car park buildings Design and provision for pedestrians public transport accessibility - travel plans 	<ul style="list-style-type: none"> Vehicle overhangs conflict with landscaping requirements 	<ul style="list-style-type: none"> Aisle width. Need to be explicit what is meant. Tracking curve and aisle. What is 90 vs 99%? 			<ul style="list-style-type: none"> Motorcycle parking should be considered 	

Standards	Issues	Landscaping / Urban Design	Parking Dimensions	Disabled	Loading	Bicycle and Motorcycle Parking	Other
<ul style="list-style-type: none"> · If linked to some sort of standards e.g. AS/NZS 2890. Need to ensure AT/AC has a say. · Too difficult for small developers if linked to standard 	<ul style="list-style-type: none"> · Large number of required carparks · Large number of consents are on carparks · Urban design vs carpark requirements · Parking rules may stop developments (eg. restaurant in small centre) · Requires objectives and policies to focus on pedestrian layout, safety etc 	<ul style="list-style-type: none"> · Integrate landscaping and carparks (improved visual amenity) · Active frontages · Dominance of carparks - compromised pedestrian safety · Blocking the legibility of pedestrian entrance · Less carparks fronting building- safer for pedestrians 	<ul style="list-style-type: none"> · Standards have some variability i.e. change dimensions to meet overall length · Use of minimum standard for a standard truck (8m), if larger use RTS 18 · Residential - do we only accommodate for cars or service/emergency vehicles · Consider restrictions on length of access ways 			<ul style="list-style-type: none"> · More for large commercial complex. Associated requirements for lockers/showers · Need for cultural shift 	
	<ul style="list-style-type: none"> · HOV parking? Large employee requirements, malls, shopping centres, offices 	<ul style="list-style-type: none"> · Low impact design · Vehicle overhangs can impinge on pedestrian path width 	<ul style="list-style-type: none"> · Austroads primary use but 2 other standards 				
		<ul style="list-style-type: none"> · 1m overhang over footpaths only, need to define overhangs vs extent of footpaths · Need to take into account the function of the footpath · Pedestrian connectivity. Pedestrian movement in parking area 	<ul style="list-style-type: none"> · AS2890.1 - like user clauses definition - link user to land use? What are the subdivision standards NZ.4404.1. · 90% or 95% 99% vehicles - size of vehicles. Again refer to AS/NZS 2890 · No parking on major circulation routes 				

Standards	Issues	Landscaping / Urban Design	Parking Dimensions	Disabled	Loading	Bicycle and Motorcycle Parking	Other
						<ul style="list-style-type: none"> Important that bicycle and motorcycle parking is covered in the plan. Comment that it is not enough to have the issue addressed at ITA level only. If it is in the unitary plan it has more weight when it comes to specific site or development applications 	<ul style="list-style-type: none"> Mobility scooter parking should also be included due to the increase in aged population
<ul style="list-style-type: none"> Use of Aust. & NZ standards for disabled parking etc in order to make the Unitary Plan clear and concise. Also, Use of diagrams combined with tables for minimum access and parking widths and provision of tracking diagrams (that are consistent with the rules) 	<ul style="list-style-type: none"> Acknowledge that parking buildings (conveniently located) are required to achieve a greater degree of both open space and density of commercial buildings in town centres 	<ul style="list-style-type: none"> Guidance on development of parking areas to meet urban design standards, e.g. streetscape, landscaping, surveillance 			<ul style="list-style-type: none"> Some commercial developments only require a car for deliveries and therefore may need different sized loading bays for different activities – noting could run into difficulties should the type of activity on the site change 		<ul style="list-style-type: none"> Direction on pedestrian access, landscaping of parking areas, direction on provision of underground or rooftop parking that may be undertaken by allowing e.g. some additional height of commercial buildings etc.

Standards	Issues	Landscaping / Urban Design	Parking Dimensions	Disabled	Loading	Bicycle and Motorcycle Parking	Other
<ul style="list-style-type: none"> · AS/NZS 2890.1 may be appropriate to adopt for the more complex designs as it does cover the user classes and design requirements for parking structures · However, are we satisfied with the actual dimensions it proposes? · For larger and more complex developments where extensive car parking facilities will be provided and/or the parking will be incorporated into a structure (basements, undercrofts, multideck carparks) the use of a more complex design standard [AS/NZS 2890.1] is the preferred approach. 	<ul style="list-style-type: none"> · In WCC's case most of the design requirements were in an external code of practice document. The biggest issue with this document was around the level of detail and ease of use. It was in some cases overly technical for assessing quite small scale development, and yet also inadequately details for complex parking structures. · The ideal approach would be to have a relatively basic set of parking dimensions applicable to simple open air car parks of small size. Probably without the complexity of different sized spaces based on user classes. 	<ul style="list-style-type: none"> · AS/NZS 2890.1 standard doesn't tackle landscaping and Crime Prevention Through Environmental Design (CPTED) issues 	<ul style="list-style-type: none"> · the aisle widths it uses with 90 degree parking are very tight, although in some of the angle parking cases its aisle dimensions seem very generous compared to existing local standards 				

APPENDIX F

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