



Practice Note 06

Vertical and Horizontal Clearance over and beside bus routes

Supplement to Engineering Design Code

Edition 1, June 2025



Summary

The Practice Note (PN) updates the required clearance standards for vegetation growth over and beside bus routes. It sets out the minimum set-back behind the kerb-face and the minimum clear height over the road surface, for route clearance, pruning and new planting.

This PN has been developed because the current Standards contained in the Engineering Design Code (Bus) and the AC Code of Practice for Land Development and Subdivision (AC CPLDS) have proven insufficient for the maintenance of trees enabling safe passage of buses, particularly double-deck buses.

Note that *Engineering Design Code – Urban and rural roadway design Section 7.3 Clearance envelopes* and *Standard Engineering Detail GD0001* require more clearance for new roads and structures. This PN applies to structures, objects and vegetation along existing roads used by buses.

An approval must be obtained from the Transport Design & Standards Manager in cases where proposed maintenance of vegetation does not meet the requirements of this Practice Note.



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1. Introduction

Street trees and lower-level planting are a vital element within the streetscape. Unlike fixed, hard infrastructure, all street vegetation grows and may eventually encroach into the operating space of moving traffic. Buses in particular approach closely to the kerb wherever customers need to board or alight in many locations. Special Vehicle Lanes require buses to be able to travel closely along the kerbside lane in order to gain any advantage from their presence.

Low-level vegetation growth can mask fixed objects, presenting a risk to the lower parts of a bus when approaching or departing from a bus stop which is where the nose and/or tail of a bus might need to overhang the kerb as the driver manoeuvres into and out of the necessary proximity to the kerb.

Trees can be a hazard to both the nearside corners in the same manner as a hard object concealed in low vegetation. The greatest hazard can be to the upper front part of a bus, particularly a double-decker in which customers are often seated immediately behind the front windows – these seats being especially popular with customers.

Trees can appear to be a fixed hazard, however the branches or fronds forming the crown can move in wind and can droop when wet. Foliage adds to the degree of droop in rain and wind, and can hide from view the branches to which it is attached. Significant branches can sag into a position where the upper front of a bus – or the upper corners both front and rear – can come into contact with them. If this happens at typical travelling speed, the hazard presented to people at or near to the windows can be severe.

This Practice Note updates *Engineering Design Code – Urban and rural roadway design Section 7.3 Clearance envelopes* and *Engineering Design Code – Public Transport – Bus Infrastructure Section 2.1 Design vehicles* for the minimum clearances required for trees and other vegetation along any corridor along which buses are expected to operate. These corridors comprise the entire AT Metro public and schools bus network, plus identified out-of-service positioning routes and routes identified as used by Ministry of Education bus services. AT's Public Transport & Active Modes team maintains [this web-accessible Infrastructure Specification and Fleet Viewer](#) within the Mahere system showing the relevant corridors.

2. Scope

This Practice Note applies to:

- all AT and AC projects initiated after implementation of this PN;
- all Consents or EAs lodged after implementation of this PN;
- any AT project commenced but not yet constructed or any Consent or ENG lodged with Auckland Council:
 - if the Manager – Design & Standards considers that an issue would arise if the design were not changed
 - and if it is practicable to change the design prior to construction
 - and the cost of changing the design can be agreed to
- all maintenance works taking place after implementation of this PN;
- any AT project commenced but not yet constructed or any Consent or EA lodged with Auckland Council for which vegetation clearance has not yet been undertaken;
- any review of vegetation in the road corridor.



3. Required Clearances

Clearance is required vertically and horizontally to ensure the safe passage of buses and other large vehicles, and the people aboard and around them. A Departure from Standards approval must be sought if these standards cannot be met at any particular location: see section 5.

Figures illustrating the following can be found in Section 3.1, showing both vertical and horizontal values. They have been numbered to correspond to the original figures in TDM EDC Bus v1,

3.1 Vertical Clearance

Engineering Design Code – Public Transport – Bus Infrastructure sets out the required minimum clear height over the road surface, for growing objects (Fig 2) and for fixed objects (Fig 3).

Living / Growing Vegetation Overhead

It has been found that the growing objects clearance minima need to be increased; as pruning and maintenance cycles have not kept pace with the growth of over-carriageway trees. For this reason, this PN adjusts Figure 2 to increase the dimensions C, D and E which now require higher clearances.

- E: main corridor clearance cutting requires 5.75m over road surface
- D: maintenance pruning is required to be cut at 5.5m over road surface
- C: vegetation must not be permitted to grow or to hang below 5.0 m over road surface.

These heights are measured over the surface of the traffic lanes. These heights apply in conjunction with the horizontal clearance requirement, such that they apply as far behind the kerb face as is required by the applicable horizontal clearance (see SED GD0002). These dimensions apply to the whole lifespan of every tree when situated beside a road, from planting to end of life.

These dimensions have been determined so that the effects of wind and rain should not be able to cause parts of trees to sag/sway into the kinetic envelope of a bus passing along the road.

On routes where double-deck buses do not operate, lower minimum clearance heights can be applied by agreement with AT's PT&AM division. Horizontal clearance will remain exactly the same. Figure 2b sets out the reduced minimum permissible height G, and the trimline height for pruning H.

AT's Public Transport & Active Modes team maintains [this web-accessible Infrastructure Specification and Fleet Viewer](#) within the internal Mahere system showing the relevant corridors that are required to be cleared to the double-decker heights as per Figure 2a; and which can be maintained to the lower minimum Standard, as per Figure 2b.

Those outside AT's IT systems can apply for secure access to the viewer (write to metrobusfeedback@at.govt.nz) or seek assistance from their AT contact for their project.



Figure 2a: minimum clearance from growing/flexible objects (such as trees and lesser vegetation) on roads used by buses

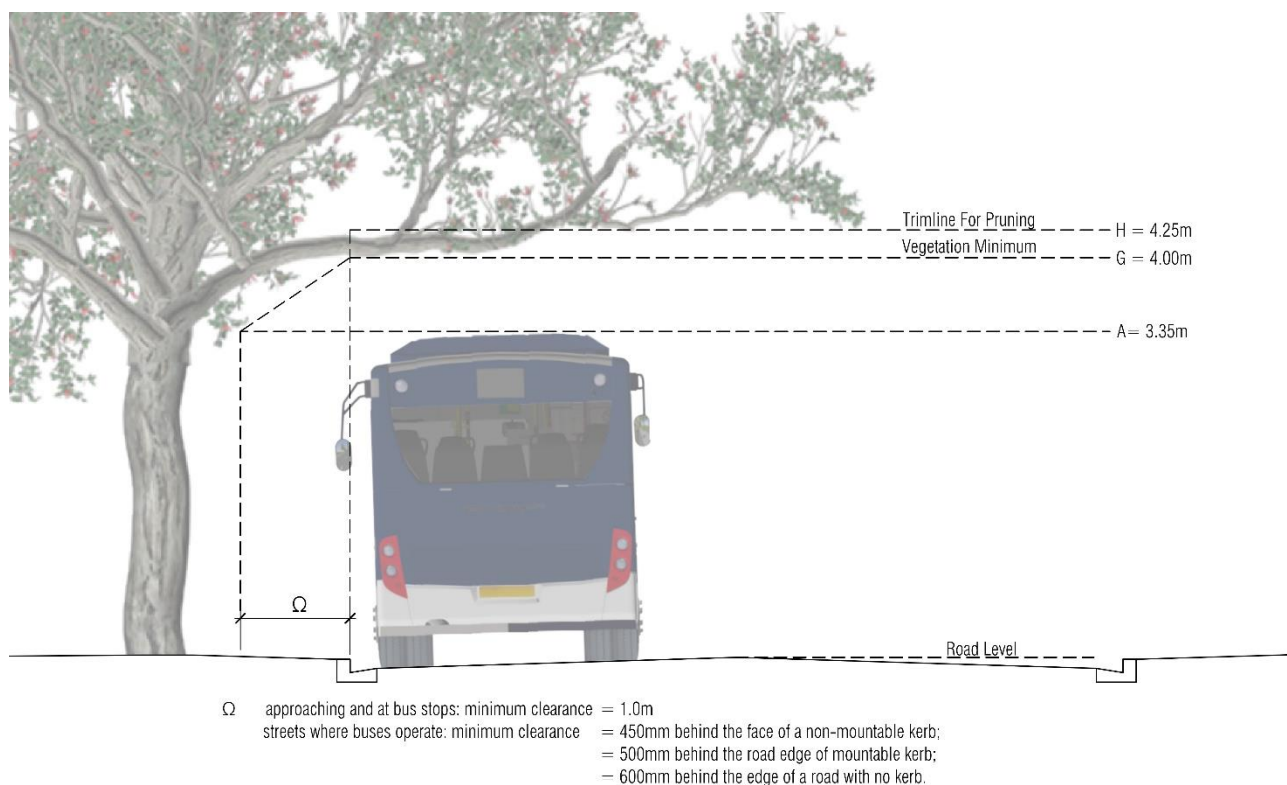


Figure 2b: minimum clearance from growing/flexible objects (such as trees and lesser vegetation) on roads used by single-deck buses only

Fixed Objects Overhead

In practice, the fixed objects vertical clearance has proven adequate and is unchanged by this PN. For clarity, Figure 3 has been updated into two separate Figures 3a and 3b so that horizontal clearance described in Section 3.2 below can be represented better relative to different roadside infrastructure.

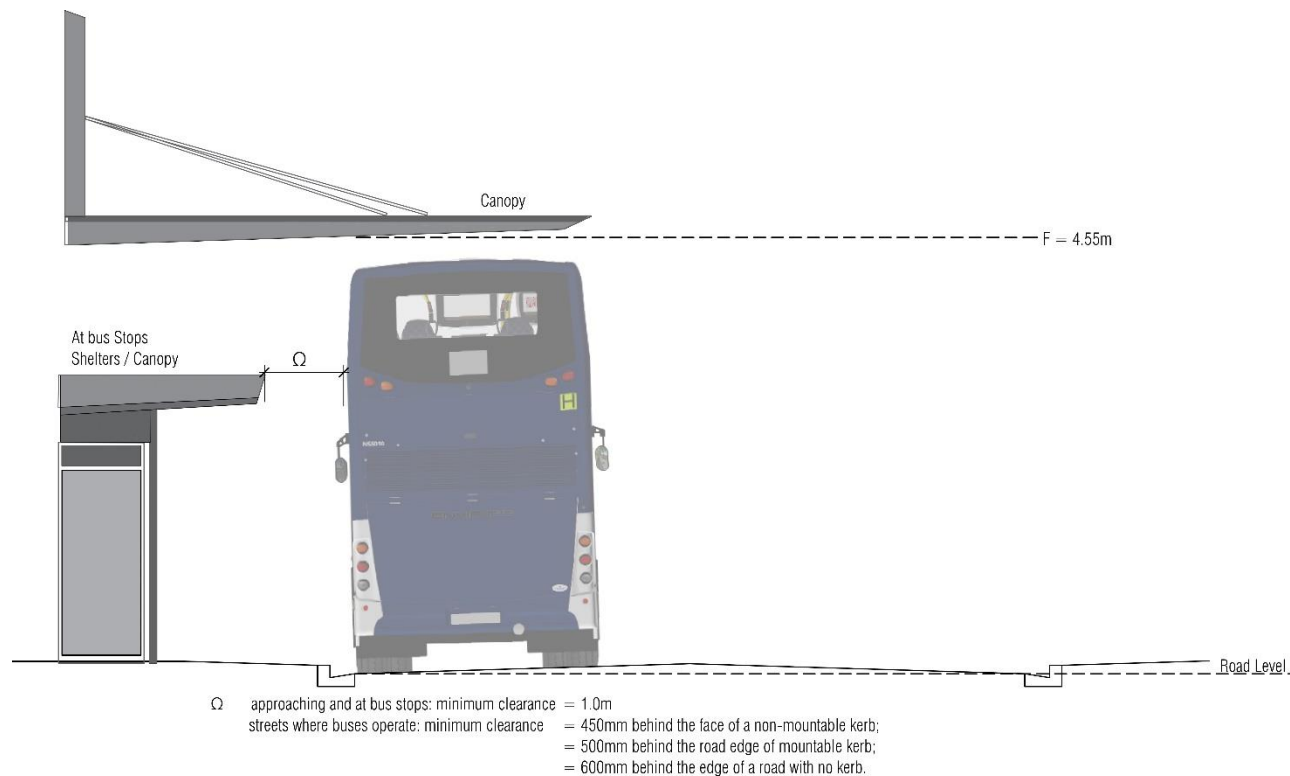


Figure 3a : Clearance from fixed obstacles (such as building canopies and shelters) at or near bus stops

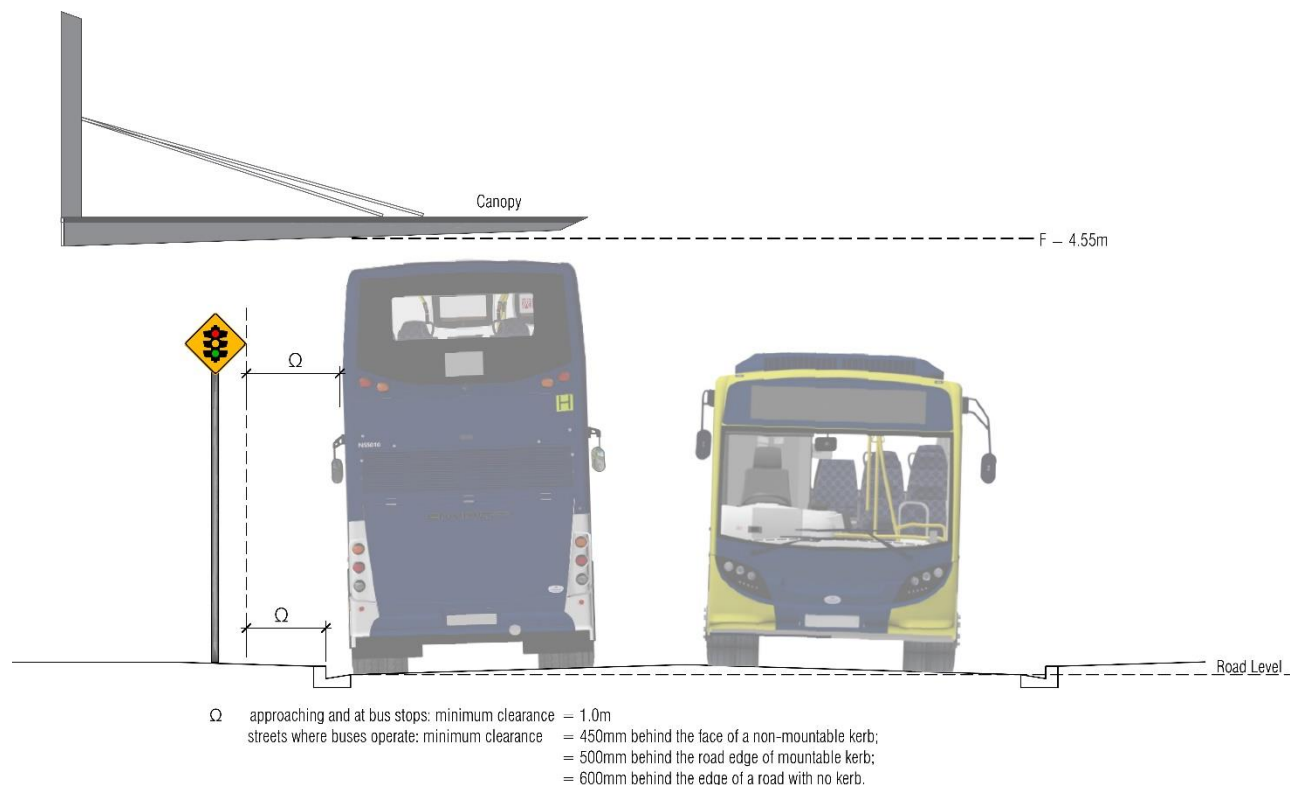


Figure 3b: minimum clearance from fixed objects (signs and poles) on roads used by buses



Additionally, Figure 3c shows the required minimum clearance height for suspended cables. Any cable made of a material that softens with heat is susceptible to sagging in hot conditions. The height clearance minimum is required to be maintained in all conditions, at all times. It is the responsibility of the owner of the cable to suspend it at a height that will remain always above the mandatory minimum clearance height F. The dashed line represents the same cable, in non-sagging condition.

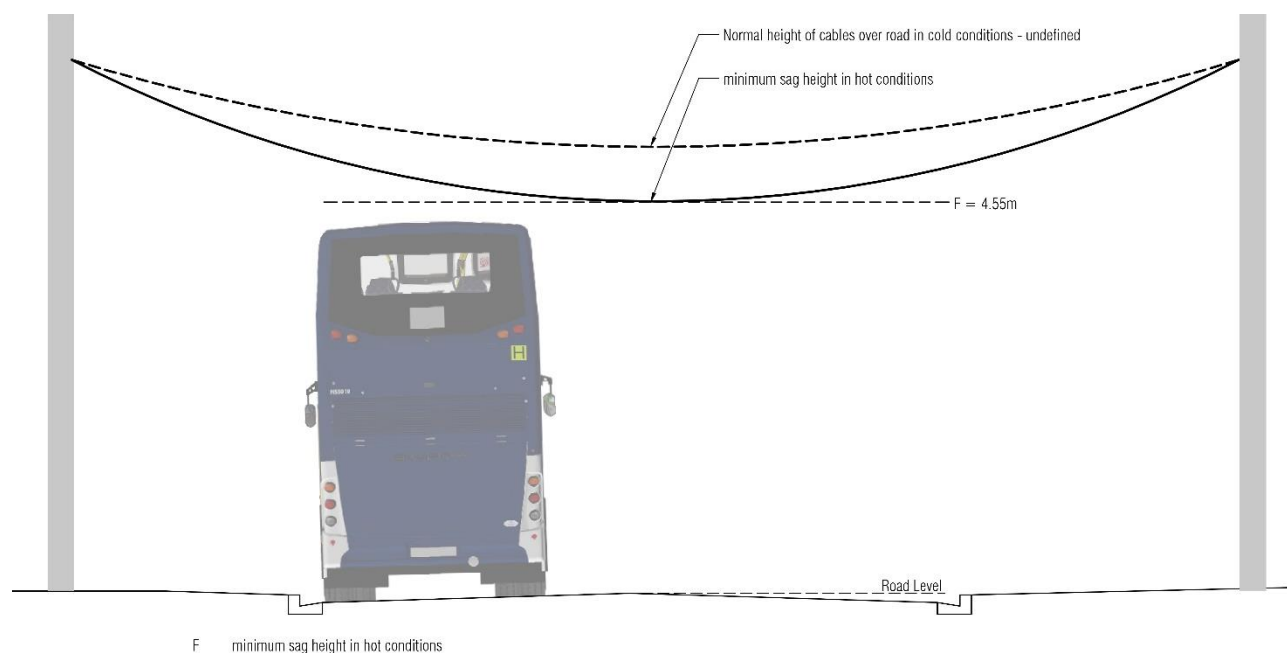


Figure 3c: minimum clearance for cables over the road.



3.2 Horizontal Clearance

Values for the required horizontal clearance minima are shown on Figures 2 and 3 above.

TDM Engineering Design Code – Public Transport – Bus Infrastructure sets out minimum approach and departure lengths for bus stops (lead-in and lead-out) which allow a bus to arrive into the marked bus stop box parallel to the kerb at the stopping point, and no more than 200mm laterally from the kerb (50mm when constructed using Kassel kerb) without overhanging either over the kerb or into the adjacent lane with the nose or tail of the bus. However, it is recognised that there are situations in which bus drivers have to follow different paths, due to conditions of traffic, non-compliant parking, or late calls by customers on the bus or at the roadside.

In these situations a bus driver might have to turn tighter, putting part of their bus over the kerb. So that the bus does not come into contact with hard objects and thus damage either the objects or the bus, a minimum clearance behind the kerb face is specified.

Should a bus approach a kerb at a severe angle, then it is possible to overhang the kerb by considerably more before the front wheel meets the kerb. The horizontal clearance requirement in this section 3.1 provides safe passage for a bus moving along a road corridor using the nearside traffic lane and pulling over to the kerbside at bus stops before continuing forward. Overhang can also occur where buses turn right on tight low-speed curves or at intersections in a kerbside lane.

Along all bus operating corridors, where the bus does not require to approach the kerb closely the minimum lateral clearance is fixed at 450mm behind the face of a non-mountable kerb; and 500mm behind the road edge of mountable kerb; and 600mm behind the edge of a road with no kerb. (Previous editions of TDM EDC Bus have specified 500mm, but other the TDM Technical Standards for Signs & Markings have required the above-mentioned 450, 500 and 600 according to kerb type, so this PN adopts the same for consistency.)

Within the length of every bus stop, starting at the head of the stop and measured along the kerb face to a position 10m upstream of the rear of the rearmost stopping position at the bus stop, the minimum required clearance behind the kerb face for all fixed objects is 1000mm. At tight radius right-hand turns this also applies to the approach to the corner (for tail-swing) and departure from the corner (for front overhang).



Effect of crossfall

The horizontal clearance above allows for road surfaces with crossfall up to 3% towards the kerbline. If the crossfall is greater, then the clearance envelope is no longer vertical from the kerb. It is to be angled from the invert of the road channel at 3% less than the road crossfall. See *SED GD0001* and *GD0002*. Figure 3d illustrates.

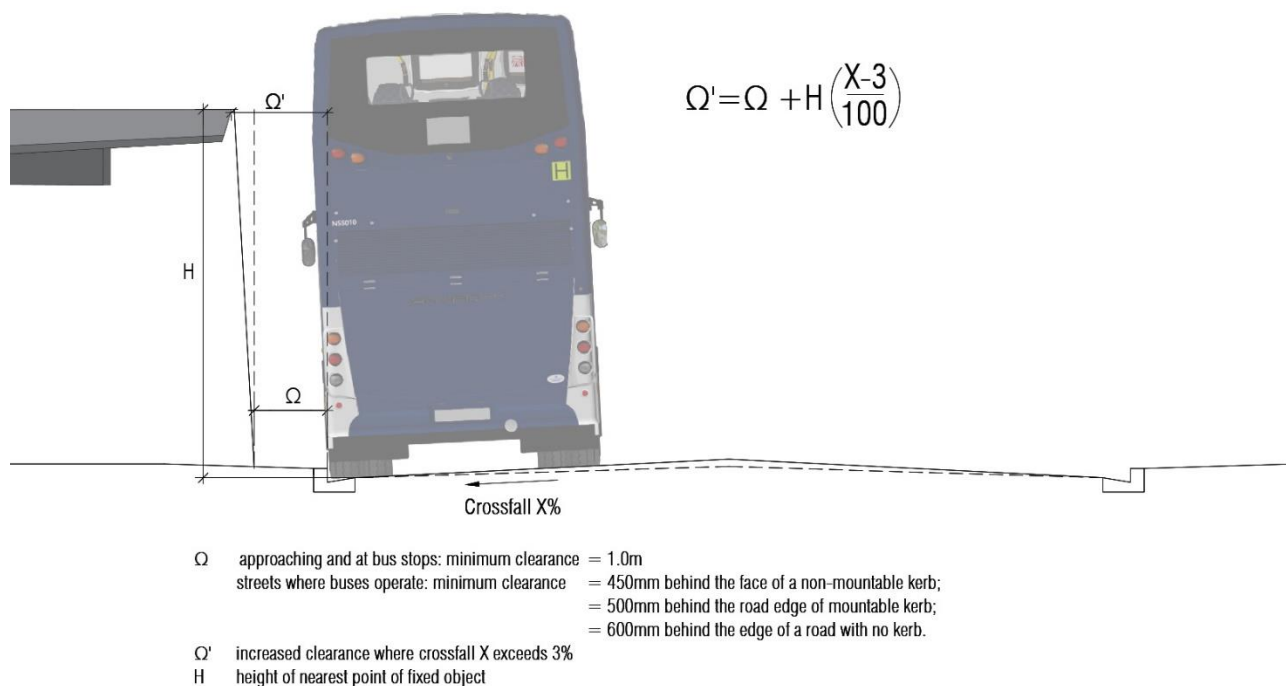


Figure 3d : Clearance from fixed obstacles increases where crossfall steeper than standard

Note that *Engineering Design Code – Urban and rural roadway design Section 7.3 Clearance envelopes* and *Standard Engineering Detail GD0001* require more clearance for new roads and structures. This PN applies to all structures, objects and vegetation along existing roads used by buses.



4. Documentation Requirements

Maintenance crews are expected to take a photographic record on the completion of each cutting instance, showing a scaled measurement of the underside of the lowest point of the lowest overhanging limb at each significant tree.

5. Non-Compliance with the requirements

Any proposal to undertake vegetation maintenance not in accordance with this Practice Note will require prior approval from AT's Transport Design & Standards Manager via the Departure from Standards process. Note that application does not guarantee acceptance and approval. The Design & Standards team will review all applications and assist in finding an appropriate solution.

6. Supporting Information

6.1 Design Manuals

- Auckland Transport – Transport Design Manual
- [Auckland Council Code of Practice for Land Development and Subdivision Chapter 3: Transport](#)

7. Approval

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AT reserves the right to review, amend or add to this Practice Note at any time upon reasonable notice to users of the Transport Design Manual and related documents.