



REQUIREMENTS FOR URBAN BUSES IN NEW ZEALAND

For consistent urban bus quality (2020)
DRAFT for consultation

SEPTEMBER 2020

Copyright information

Copyright ©. This copyright work is licensed under the Creative Commons Attribution 4.0 International licence. In essence, you are free to copy, distribute and adapt the work, as long as you attribute the work to Waka Kotahi NZ Transport Agency and abide by the other licence terms. To view a copy of this licence, visit:

creativecommons.org/licenses/by/4.0

Disclaimer

Waka Kotahi NZ Transport Agency has endeavoured to ensure material in this document is technically accurate and reflects legal requirements. However, the document does not override governing legislation. Waka Kotahi does not accept liability for any consequences arising from the use of this document. If the user of this document is unsure whether the material is correct, they should refer directly to the relevant legislation and contact Waka Kotahi.

More information

Waka Kotahi NZ Transport Agency
Published September 2020

ISBN 978-0-478-41988-7 (online)

If you have further queries, call our contact centre on 0800 699 000 or write to us:

Waka Kotahi NZ Transport Agency
Private Bag 6995
Wellington 6141

This document is available on the Waka Kotahi website:

www.nzta.govt.nz

Contents

RECORD OF AMENDMENTS	5
ABBREVIATIONS / DEFINITIONS	6
1. INTRODUCTION.....	8
1.1. Introduction.....	8
1.2. Scope	10
1.3. Bus sizes	11
2. DESIGN AND PERFORMANCE.....	12
2.1. Introduction.....	12
2.2. Maximum vehicle age and fleet average age profile.....	12
2.3. Performance.....	12
2.4. Environmental	13
3. VEHICLE ENTRANCE AND EXIT	14
3.1. Ramp.....	14
3.2. Ticketing/fare collection area.....	14
3.3. Doors	15
3.4. Step height/depths	15
3.5. Step and plinth edges.....	16
4. VEHICLE INTERIOR	17
4.1. Driver compartment.....	17
4.2. Driver operational communication.....	17
4.3. Priority seating area	18
4.4. Wheelchairs.....	19
4.5. Floors.....	20
4.6. Aisle width	21
4.7. Seating design.....	21
4.8. Stanchions/handrails	22
4.9. Grab handles on seat backs	25
4.10. Internal lighting	25
4.11. Security and safety.....	26
4.12. Heating, ventilation and air conditioning (HVAC).....	29
4.13. Demisting.....	29
4.14. USB power ports	29
5. COMMUNICATION	30
5.1. Requirements	30
5.2. 'Bus stopping' electronic signs and buttons	30
5.3. External destination display	31
5.4. Exterior promotional area.....	32

5.5. Internal information.....	33
6. EXISTING BUSES	34
6.1. Introduction.....	34
6.2. Existing bus standards	34
6.3. Midlife refurbishment requirements.....	35
7. APPENDIX	36
7.1. Items not included	36
7.2. Visual contrast.....	36
7.3. Bicycle racks	37
7.4. Noise measurement	37
7.5. Process for seeking a variation to these requirements.....	38
8. FUTURE INTENTION	40
8.1. Future technologies intended to be required (in no particular order).....	40

DRAFT

RECORD OF AMENDMENTS

AMENDMENT NUMBER	DESCRIPTION OF CHANGE	EFFECTIVE DATE	UPDATED BY
1	Review of RUB first published in 2008.	Start of 2012–2015 NLTP	Chad Barker
2	Amendment to accommodate the introduction of double-decker buses.	July 2013	Chad Barker
3	Three-yearly review of the RUB.	December 2014	Chad Barker
4	Regular review of the RUB post PTOM contract implementation.	2020	Michelle McCormick/ Kirsten Boardman
5	Updated document template, abbreviations/references from NZ Transport Agency (NZTA) to now be Waka Kotahi NZ Transport Agency (Waka Kotahi) to reflect updated name and brand.	September 2020	

ABBREVIATIONS / DEFINITIONS

ABBREVIATION	DEFINITION
AB	Articulated bus
ABS	Anti-lock braking system
AO	Approved Organisation – as per LTMA
AS 3696.13	Australian Standard AS.3696.13 Wheelchairs – Determination of co-efficient of friction of test surfaces
ASR	Anti-spin regulation/drive slip control
BCA	Bus and Coach Association New Zealand
CONTRAST	Refers to the ability to distinguish between two colours, see the Visual contrast section
CURRENT	With regards to legislation, the version of an approved standard that is applicable in the relevant standard-setting jurisdiction to the date of manufacture of the vehicle or a component, or a more recent version of that standard.
DD	Double decker
EBS	Electronic braking system
ECAS	Electronically controlled air suspension
ESC/ESP	Electronic stability control or programme
EV	Electric vehicle
GPS	Government Policy Statement
Grab handle	Has the same meaning as 'handgrip'
GVM	Gross vehicle mass
HFC	Hydrogen Fuel Cell Bus - Bus that uses a hydrogen fuel cell as its power source for electrically driven wheels.
LB	Large bus
LBDD	Large bus double-decker
LEF	Low-entry floor – low entry from the front entrance to the rear exit, including priority seating area.
LTMA	Land Transport Management Act 2003
MB	Medium bus
New	New vehicles: All components including running gear, chassis and body must be new and not previously registered whether in full or in part.
NLTF	National Land Transport Fund
NLTP	National Land Transport Programme
NZTA / Transport Agency	Waka Kotahi NZ Transport Agency

ABBREVIATION	DEFINITION
P&I	The Waka Kotahi NZ Transport Agency Planning and Investment group
PTOM	Public Transport Operating Model
RTS14	Road and traffic standard series RTS14 Guidelines for facilities for blind and vision impaired pedestrians (revision 2, 2009)
RUB	Requirements for urban buses in New Zealand: New Zealand's common standard for urban bus quality
SB	Small bus
SLF	Super low floor – low floor throughout the passenger compartment.
Seat	The assembly, or part of an assembly, intended to seat at least one person
Seating position	A seat or part of a seat that is of a suitable size and shape for one person
VQS	Vehicle quality standard
VSb	Very Small Bus
VLb	Very Large Bus – Double decker buses or articulated buses
Waka Kotahi	Waka Kotahi NZ Transport Agency

1. INTRODUCTION

1.1. Introduction

1.1.1. Purpose of the RUB

The purpose of the RUB is to standardise urban bus requirements across regional councils and Auckland Transport to create efficiencies and improve the usability and accessibility, as well as environmental quality of buses for all customers. The RUB is intended to be the standard for national bus quality and efficiency and takes precedence over regional VQS.

The adoption of a common standard approach like the RUB results in:

- net savings, due to reduced capital and operating costs of purchasing, and operating urban buses
- reduced time in understanding and complying with multiple regional Vehicle Quality Standards, and
- more efficient use of urban buses by public transport operators because buses can be used in more than one region without costly modifications.

The RUB has wider benefits at a national level, including:

- improving the perception held by existing and potential users that buses can be used for all urban travel, including commuter, shopping, education and recreational activities travel
- an increase in usage of public transport, including by an ageing population and people with physical, sensory and cognitive impairments
- reducing bus design and feature variations that result in higher unit costs for supply, and
- safety and environmental benefits.

Waka Kotahi agrees that the quality of buses is necessary for creating a valued customer experience. It is also an important way to attract more patronage from people who have a greater choice about whether they use public transport to get to where they want to go. The RUB is a common New Zealand-wide vehicle quality standard for use in urban bus contracts. Regional councils and Auckland Transport must use the RUB so that they can access Waka Kotahi investment for public transport services involving buses. Waka Kotahi requires this through its procurement rules.

The RUB was developed through a collaborative process with Regional Councils, Auckland Transport, Bus and Coach Association New Zealand (BCA), bus operators and suppliers to the industry. A considerable amount of work was undertaken with organisations representing people with impairments. As part of the development of the RUB it was agreed by the stakeholders that it should be reviewed every three years.

1.1.2. The evolution of the RUB

In 2007/08, Regional Councils requested advice from Waka Kotahi about the terms that should be in their new urban bus services contracts, so that those contracts provided for better access and usability of vehicles by customers.

The BCA also indicated its interest in obtaining more uniformity than currently existed in VQSS used by Regional Councils throughout New Zealand for operational reasons and potential cost savings.

Waka Kotahi agreed that it was beneficial to develop a set of vehicle requirements for urban buses to be applied nationally. A key issue was (and is ongoing) how to provide for the mobility needs of people with physical, sensory and cognitive impairments. There was also a conscious effort from stakeholders involved in planning and investing in public transport to look for ways to improve the customer experience.

The first version of the RUB was published in December 2008 and came into effect on 1 January 2010, providing a transition period for regional councils and operators. The RUB was updated in September 2011 to clarify its purpose, take the opportunity to update vehicle requirements, and make it a Waka Kotahi procurement rule to be able to access Waka Kotahi investment for public transport services involving buses. It was updated in July 2013 to include definitions of double-decker buses and again in December 2014 as part of the three-yearly review.

1.1.3. Strategic context

The Land Transport Management Act 2003 (LTMA) has a purpose of contributing to an effective, efficient and safe land transport system in the public interest. The LTMA provides the legal framework for managing and investing in land transport activities. The LTMA requires Waka Kotahi to invest its revenue in a manner that seeks to achieve value for money.

The Government Policy Statement (GPS) on Land Transport Funding highlights the Government's outcomes and priorities for the land transport sector and sets out an investment range for different activities over a ten-year period. The current GPS (2018) highlights four clear priorities: a safer transport network free of death and injury, accessible and affordable transport, reduced emissions, and value for money. Waka Kotahi applies the GPS to its investment decision-making through an Investment Assessment Framework. In this context, increasing the value for money from public transport investment, and making the most of urban network capacity is a priority.

The LTMA sets out the statutory provisions regulating and managing public transport in New Zealand.

These provisions, in Part 5 of the LTMA, form the high-level legal framework and are based on Government policy – PTOM – designed to improve procurement outcomes and service delivery of public transport. PTOM was a paradigm shift in the delivery of public transport services in New Zealand with the aim of providing a framework for building long-term, collaborative public transport partnerships between Regional Councils/ Auckland Transport and bus operators. At a high level, the aim of PTOM was to grow patronage with less reliance on public subsidy.

1.1.4. Implementation

The Waka Kotahi expectation is that all Regional Public Transport Plans prepared under the LTMA include a policy of using the RUB for vehicle quality standards, and all public transport contracts will incorporate the RUB requirements as they are rolled out.

1.1.5. Verification of RUB requirements

The requirements of the RUB are contractual in nature and because verifying buses' compliance to the RUB is outside the scope of Land Transport Rule: Vehicle Standards Compliance 2002, compliance with the RUB is not checked during inspection and certification for entry into service or afterwards at in-service periodic inspections and certifications (CoFs).

All public transport contracts incorporating the RUB must incorporate an inspection regime to verify compliance. At a minimum, a bus's compliance with the RUB must be verified prior to entering urban service and continued compliance must be verified as required by the regional council.

Inspection organisations and vehicle inspectors appointed by the Agency to conduct inspections and certifications for entry into service or in-service periodic inspection and certification are well-positioned to be able to conduct RUB compliance checks. Additional tools may be required, such as lighting meters or noise meters. Regional councils can choose to verify compliance with the RUB themselves or can outsource the RUB compliance inspections to CoF-A (light vehicle) or CoF-B providers (heavy vehicles), or another capable organisation, via agreement.

1.2. Scope

1.2.1. Regional Council/Auckland Transport contracted urban bus services

The RUB applies to Approved Organisations contracted to deliver public transport bus services in urban centres. The specifications contained in this document apply to buses entering the urban fleet for the first time, however, there are some minimum specifications that will apply to existing buses (see section 6).

This document is also not generally applicable to other forms of bus and coach operations, e.g. Approved Organisation's contracted school and rural services, tourist, charters, intercity services or school services funded by the Ministry of Education, and either contracted through its agents or directly by schools themselves. Again, however, there are some minimum specifications that can be applied, at an Approved Organisation's discretion, to buses providing school and rural services (see section 6, including options for maximum age).

1.2.2. What does 'new to urban service' mean?

'New to urban service' means any new or used bus entering urban service in New Zealand for the first time. Technically, there are two definitions of a 'new' bus – the date of manufacture and the date of first registration in New Zealand.

This distinction is important to note because a bus will have a date of manufacture, then after it comes into New Zealand and is entry certified here, the bus is only subject to transport Rules when it is registered to go on the road. The relevant date here is the date of registration in New Zealand.

In the case of any existing urban service bus being accepted into a new urban service contract, the bus in question must:

- comply with the version of the RUB applicable to the age of the bus, or
- if pre-RUB, at a minimum meet the requirements listed in section 6, and
- be acceptable to the receiving Regional Council.

In the case of any bus entering into an urban service contract for the first time, the bus in question must:

- comply with the latest version of RUB, and
- the vehicle age will be deemed to be from the date of first registration anywhere.

1.2.3. Does the RUB apply to new, used and existing vehicles in the fleet?

This document is intended for use by Approved Organisations in their procurement of urban bus services. It specifies:

- requirements that apply to all buses entering urban service as PTOM contracts are rolled out (sections 2 to 5),
- requirements for existing urban service buses accepted into a new urban contract (section 6), and
- requirements for the Midlife refurbishment of existing fleet (section 6.3).

1.2.4. Does the RUB apply to new, used and existing vehicles in the fleet?

Any buses that have been ordered prior to publication of this version of the RUB will be exempt, provided that the last delivery date for any such bus under the contract with the supplier is no later than one year after the commencement of the RUB in force at this time. This includes orders for newly constructed buses, as well as new or used imports. The date of publication of this version of the RUB is **to be confirmed once this is finalised post consultation**.

Operators will need to provide written evidence to the relevant Regional Council to confirm contracts and delivery schedules to qualify for this exemption. Any bus qualifying for this exemption must still comply in all respects with the previous version of the RUB published in 2014 or VQS in place at the time.

1.2.5. RUB compliance and variation for rural services, inter-city commuter, and airport services

All buses contracted to Approved Organisations must be RUB compliant. Buses providing urban school trips which are part of PTOM unit contracts must also comply with the RUB. Variations could be considered for buses providing a unique commuter service (e.g. extra luggage space for an airport service) but must maintain wheelchair accessibility and priority seating. It is important for bus providers to engage with the disability community when considering these unique solutions. These alternative solutions may have unique ticketing solutions.

- A very small bus (VSB) has 13 to 25 passengers (excluding the driver), includes a minimum of 13 seating positions.
- 'Inter-city commuter service' refers to any service that is a longer distance service that travels on open roads.
- 'Rural service' means any service that begins or ends in a rural area.
- 'Rural area' means any area judged to be rural in character, based on a reasonable assessment of its geographic features, resident population, dominant forms of employment and other relevant features.

1.2.6. Land transport rules

This RUB is focussed on the quality and usability aspects required to meet the needs of public transport bus customers. It is a quality standard delivered through a supplier service contract relationship and is subsidiary to the land transport rules. These rules are legislative requirements focussing on, among other things, commercial vehicle safety, dimensions, mass and emissions.

This document is subsidiary to the legislative requirements for vehicles in New Zealand. All requirements of the RUB are in addition to, and do not replace land transport rules.

See land transport rules: www.nzta.govt.nz/resources/rules

1.2.7. Regular reviews of the RUB

The practical implementation of these requirements may highlight new ways of dealing with particular issues that may arise and the intent is that we should make improvements if need be. It is, therefore, proposed that this document be formally reviewed every five years or the recommendation of the review panel.

¹In the event of dispute, this is to be determined by the Transport Agency at its sole discretion. Population and other statistical data (where used) to be sourced from the most recent national census data compiled by Statistics New Zealand.

1.3. Bus sizes

For the purpose of this document, a bus is a heavy vehicle that provides a service with more than 12 seating positions.

Small bus (SB)	Up to 53 passengers (excluding the driver), includes minimum of 24 seating positions.
Medium bus (MB)	54-74 passengers (excluding the driver), includes minimum of 24 seating positions. If double decker, MBDD.
Large bus (LB)	75 or more passengers (excluding the driver) includes minimum of 36 seating positions. If double decker, LBDD; if articulated, LBAB.
Very large bus (VLB)	95 or more passengers (excluding driver) includes minimum of 80 seating positions. If double decker, VLBDD; if articulated, VLBAB.

References are to all bus sizes unless specifically noted as to the size category in the relevant sections that follow.

2. DESIGN AND PERFORMANCE

2.1. Introduction

The chassis must be fit for purpose as required by the heavy vehicles rules, e.g. Land Transport Rule: Vehicle Dimensions and Mass 2002 and Land Transport Rule: Passenger Service Vehicles 1999. The chassis shall be of an appropriate design and use protective material, or techniques such that a bus can be expected to give 20 years reliable life under normal high-intensity urban operational conditions of service, without incurring major structural failures or the need for major overhaul requirements due to operating, roading, and environmental conditions, excluding those that are attributable to vehicle crashes.

2.2. Maximum vehicle age and fleet average age profile

The maximum permitted vehicle age is 20 years from the date of manufacture – this also applies to EV buses. At the ‘midlife’ of a bus (10 years from first entry into urban service in New Zealand) a bus must be refurbished (refer to section 6.3). Consideration needs to be given to the whole-of-life of an EV and for the recycling of the vehicle’s components.

Note: This applies to all vehicles, irrespective of whether they are new to urban service or existing buses.

2.3. Performance

All sizes – includes all modes of propulsion, i.e. liquid fuel, electricity, gas, hydrogen, or hybrid.

ACCELERATION ALL BUSES	Minimum: 0-50 km/h ≤ 18 seconds. Note: Acceleration is measured in an unladen bus on a level road. The average of two tests, one in each direction within a period of 30 minutes. (Harsh acceleration is covered in section 4.11)
TRANSMISSION	Fully automatic or electronic shift, plus retarder (Does not apply to EV buses).
SUSPENSION	Air suspension. Kneeling capability at front and rear doors with a kneel and rise time of <8 seconds each. ECAS, including self-levelling.
ALL BUSES	ESC/ESP is required.
STABILITY AND STEERING	ABS and EBS is required.
VEHICLE BRAKING	Vehicles must be capable of being held by the hold brake (the automatic activation of the service brakes upon the opening of the doors), restarting without rolling back on sealed grades. Additional option – engage the hand brake system before doors are able to be opened. If the passenger door is opened and the vehicle is stationary, the brakes must be activated, the engine throttle returned to idle, and the vehicle incapable of moving. It must not be possible for the brakes to be released unless done so by the driver, in the driver’s seat.

HOLD BRAKE/ INTERLOCK	<p>Non-flammable material - comply with ECE 118.02.</p> <p>Engine Compartment for diesel: Fire retardancy ISO 3795 (1998) or FMVSS 302 or UN/ECE Reg. 118 (or technical equivalent).</p> <p>Fire Suppression for Engine compartment is mandatory: Must be compliant with Australian Standard AS 5062 2006 (Fire Protection for Mobile and Transportable Equipment) or an equivalent internationally recognised standard.</p> <p>Battery packs and EV systems: Must comply with UN/ECE Reg. 100 (or technical equivalent) for EVs,</p> <p>Hydrogen Fuel Cell Vehicles: EC No.79 (or technical equivalent).</p> <ul style="list-style-type: none"> Indication on the bus is needed to identify propulsion type and a standard location of a kill switch. <p>An external common label/sticker (yet to be designed) is required to be placed at the right front corner of the bus below the drivers' window to identify electric or hydrogen buses to emergency services. This label/sticker is not required for diesel or petrol buses. Additional signs to be placed on external panels identifying where battery packs are located.</p>
----------------------------------	---

2.4. Environmental

EXHAUST EMISSIONS	<p>Current Vehicle Exhaust Emissions Rule with the exception that EURO VI C-stage (as defined in Table 1 of Appendix 9 of Commission Regulation (EU) No 582/2011) or better is required for a new bus.</p> <p>Any emissions-defeating or tampering (e.g. cheating devices, ECU-remapping, etc.) that disables AdBlue or other systems is strictly prohibited.</p> <p>All emissions control equipment must remain functional and within safe tolerance of its state when manufactured.</p>				
EXTERNAL NOISE	<p>These situations reflect urban on-road performance.</p> <table> <tr> <td>On-road noise</td><td> <p>Maximum peak 77 dB(A), measured while driving by at 50 km/h, fully laden, measured at a distance of 7.5 metres from the centreline.</p> <p>For microphone setup, refer to Figure 1 of Annex 3 of UN/ECE Reg. No. 51, also referenced in 7.4.1.1.</p> </td></tr> <tr> <td>Air brake noise</td><td> <p>Maximum 72 dB(A), measured at a distance of 7 metres while the vehicle is stationary.</p> <p>Refer to Figure 1 of Annex 5 of UN/ECE Reg. No. 51 for positioning of sound meter for testing and 7.4.1.2.</p> </td></tr> </table>	On-road noise	<p>Maximum peak 77 dB(A), measured while driving by at 50 km/h, fully laden, measured at a distance of 7.5 metres from the centreline.</p> <p>For microphone setup, refer to Figure 1 of Annex 3 of UN/ECE Reg. No. 51, also referenced in 7.4.1.1.</p>	Air brake noise	<p>Maximum 72 dB(A), measured at a distance of 7 metres while the vehicle is stationary.</p> <p>Refer to Figure 1 of Annex 5 of UN/ECE Reg. No. 51 for positioning of sound meter for testing and 7.4.1.2.</p>
On-road noise	<p>Maximum peak 77 dB(A), measured while driving by at 50 km/h, fully laden, measured at a distance of 7.5 metres from the centreline.</p> <p>For microphone setup, refer to Figure 1 of Annex 3 of UN/ECE Reg. No. 51, also referenced in 7.4.1.1.</p>				
Air brake noise	<p>Maximum 72 dB(A), measured at a distance of 7 metres while the vehicle is stationary.</p> <p>Refer to Figure 1 of Annex 5 of UN/ECE Reg. No. 51 for positioning of sound meter for testing and 7.4.1.2.</p>				
INTERNAL NOISE	<p>Attention must be taken to minimise noise, vibration and harshness transmitted to passengers. Factors such as noise, mechanical noise and air conditioning noise must be minimised.</p>				

3. VEHICLE ENTRANCE AND EXIT

3.1. Ramp

MEASUREMENTS	<p>A manually-operated flip-over style ≥800 mm width ramp must be provided at the front door that can be deployed and recovered by the driver on request, where the kneeling facility proves to be insufficient.</p> <p>The maximum ramp gradient must be 12% from an infrastructure design standard kerb.</p>
DESIGN FEATURES	<p>Ramp hinges and lifting handles (65mm minimum) must be countersunk/flush with the floor to reduce the interference to passengers on foot or in wheelchairs.</p> <p>The driver's lifting handle must be full hand-width style, rather than a single digit ring-style pull up.</p> <p>The ramp surface (when deployed) must be covered in a slip resistant material (refer to Floors).</p> <p>The three edges of the ramp surface (when deployed) must be highlighted with a yellow edge as detailed in section 3.5.</p>
SIGNAGE	<p>A wall mounted sign adjacent to the front door (preferably pictorial) shall indicate the permitted maximum weight of the ramp eg, 300 kgs and maximum width of any wheelchair or pram that can be carried by the bus ie, 700 mm (excluding the user).</p>

3.2. Ticketing/fare collection area

Any tag-on/tag-off equipment must be readily accessible and be easy to use by adults and children, irrespective of whether they have a disability or not. The positioning of the tag-on/tag-off equipment must be such that it does not reduce any of the clearances specified for accessibility.

FRONT DOOR	<p>All ticketing/revenue collection that requires interaction with the driver (card or cash) for all passengers of any capability, including those using wheelchairs, is to be through the front door.</p> <p>Boarding using an electronic revenue system with a tag-on requirement must be through the front door only. Alighting using a tag-off electronic requirement may be through either the front or rear doors.</p> <p>Ticketing equipment and till stand should be ergonomically located for driver ease of use. Ticketing equipment and till stand must not impede the driver's vision or access by wheelchairs, the height of the ticketing machine must be between 900-1000mm.</p>
REAR DOOR	<p>Alighting using a tag-off electronic requirement may be through either the front or rear doors. Must have the ability to tag on and off at the rear door.</p>

3.3. Doors

NUMBER	SB/SB	One front door.
LOCATION	MB/LB/VLB	One front and one rear. Larger vehicles that will be used solely on longer-distance urban express/limited stop style, or school bus services, may use only one door. Regional Council prior approval for this configuration is required.
DESIGN – DOOR ENTRAPMENT PREVENTION	All buses	Front door will be as close to the front of the bus as possible, and immediately opposite and in full view of the driver. The rear door will be located at low floor level at a maximum distance of 6500 mm behind the front door, when measured from the centre of the front door to the rear-most opening of the rear door. For articulated buses, a third door further to the rear of the rear section may also be provided.
WIDTHS (CLEAR SPACE EXCLUDING ANY HANDRAILS ON THE DOOR)	Front door	≥1000 mm double leaf.
	Rear door	SB/SB/MB ≥700 mm single or double leaf for the rear door, if fitted. LB/VLB ≥1000 mm double leaf.
REAR DOORS		A door system is required that cannot trap people inside the bus (e.g. outward opening (plug) type doors).
HOLD BRAKE		The activation of either door open control must activate the service brakes (braking system) (See 2.3 Performance)
WEATHER SCREEN		Provision for a weather screen shall be provided both sides of the rear door and at the rear side of the front door to provide passengers shielding from the weather when doors are open. Fitment is optional by AO.

3.4. Step height/depths

DOOR STEP HEIGHT MEASUREMENT	<p>Measurement to be taken at the midpoint of the open-door aperture with the bus on level ground (not on a cambered surface) and includes the step edge nosing.</p> <p>Kneeling is a requirement for all buses.</p> <p>Automatic kneeling capability is not required, rather this should be manually controlled by the driver. If the capability is used every time the bus stops it will use unnecessary air and, therefore, increase fuel costs, as well as slow down overall journey times. A sign/sticker stating 'This bus kneels on request' must be provided on the exterior of the bus adjacent to the front door.</p>
FRONT AND REAR DOORS	<p>≤370 mm at normal ride height ≤300 mm kneeled (front door)</p>
ANY ADDITIONAL STEPS, INCLUDING AISLE OR SEAT PLINTHS	<p>For passenger confidence, step heights should preferably all be of equal height. A maximum of two different heights is permitted.</p> <p>Minimum step depth (i.e., the horizontal measurement from the front edge to face of the next riser), except for any steps to access forward facing seats on the front of the wheel arches minimum step depth, is >220mm. To be clear, this applies to any steps into the rear saloon area by the rear door/axle location.</p> <p>The steps to the rear saloon must be built into the rear saloon floor. There must be no steps in the rear doorway.</p>

3.5. Step and plinth edges

DESIGN

All steps at door entry and exits or within the vehicle shall have full width step edges (nosing) fitted with a distinctive high-visibility yellow colour, slip resistant/non-trip style nosing in a solid band, contrasting with the immediately adjacent flooring material.

The steps' high-contrast nosing in the horizontal planes is to be within the range of 50 mm–65 mm wide and 30 mm–55 mm on the vertical planes.

Refer to:

Floors for the slip resistant performance requirements.

Refer to [Visual contrast](#) for the contrasting colour performance requirements.

DRAFT

4. VEHICLE INTERIOR

4.1. Driver compartment

The role and responsibility of the urban bus driver in coping with the levels of urban traffic and congestion, the various requirements of passenger loading, revenue collection, unloading and dealing with the range of passenger requests for assistance and information is a demanding one. Any features that make the task easier and safer to carry out will be to the overall benefit of the public bus transport industry. The bus driver's compartment is part of his/her workplace and they can spend most of their working day in that compartment.

COMFORT	<p>Provision of:</p> <ul style="list-style-type: none">• A fully sprung driver's seat with adjustment for all three planes of driving position. The driver's seat suspension should be capable of being adjusted to cater for varying driver weight.• A readily adjustable (tilt and height) steering wheel column and soft style easily-cleaned, and dried, steering wheel.• A footrest for the left foot.• Coat/jacket storage, e.g. hook.• An area out of sight for the storage of personal belongings such as bag/lunchbox.• A seatbelt is required. <p>Personal driver-controlled form of heating and cooling, including to the foot area. Can be part of the bus climate control system, but the driver must be able to control the flow and direction.</p>
ON-BOARD SECURITY	<p>Barrier protection panel immediately behind the driver to prevent any form of assault from behind, either directly by a passenger or by a thrown object.</p> <p>A revenue collection and holding system so that the driver's cash can be readily and securely locked into a cash box that can be secured to the bus, e.g. to the ticket issuing equipment stand.</p>

4.2. Driver operational communication

For an urban fleet service requiring more than five buses in service at any one time, a two-way radio shall be provided to provide communication between buses of the same operator, back to base depot and to any central information or control centre.

4.3. Priority seating area

The priority area is a key concept in achieving accessibility. The picture below shows the general location of the priority area – it is not intended to show all the features and dimensions of the priority area.

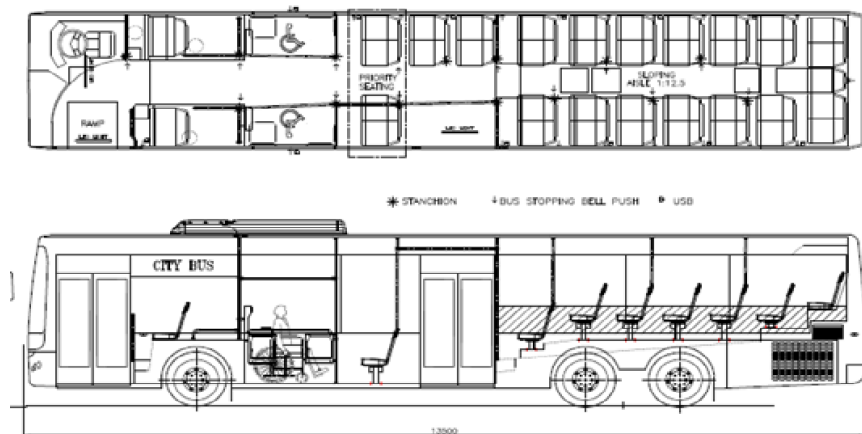
Priority seating for those with physical, sensory and cognitive impairments (including when accompanied by a guide dog) and parents/caregivers with children, irrespective of whether a pram or stroller is being used, must be located as far forward as possible to minimise the distance to the front door.

Diagrams below showing an example of (a) medium-sized and (b) large-sized bus priority seating area layout:

(a)



(b)




Provision shall be made as follows for passengers with physical, sensory or cognitive impairments, including those that may be accompanied by a guide dog:

LOCATION	<p>The priority area is located well to the forward end of the saloon (in the case of an DD, the lower saloon), preferably immediately to the rear of the front wheel arches, or for DD immediately to the rear of the front wheel arches and stairwell, and encompasses a minimum of:</p> <ul style="list-style-type: none"> • For all buses there must be one multi-use/wheelchair space that will accommodate one wheelchair and user, or pram user, on the nearside of the vehicle, and • For single deck buses an additional multi-use/wheelchair space that will accommodate one wheelchair and user, or pram user, on the far side of the vehicle. • One side-ways facing, folding seat will be located immediately behind each wheel arch – to facilitate wheelchair access and stowage. Any fold-up seat must be capable of being held in the stowed position. <p>There must be a horizontal handhold for occupants of side-ways facing seats</p>
MEASUREMENTS	<ul style="list-style-type: none"> • Multi-use/wheelchair spaces must have dimensions of not less than 800 mm by 1300 mm to cater for a wheelchair or other mobility device with a footprint of ≤700 mm width x ≤1200 mm length x 1100mm high and its user. The mobility device must be stable, i.e. must not fall over if not supported.
SIGNAGE	<ul style="list-style-type: none"> • Contrasting easily seen signage to indicate the area and request to vacate seats for use by passengers with disability/mobility needs along the following lines: ‘Priority seating area - Please vacate these seats for elderly or disabled passengers or parents/caregivers with children.’

4.4. Wheelchairs

Wheelchairs are described as both manual self/caregiver-propelled or powered versions of required characteristics as follows:

MEASUREMENTS	<ul style="list-style-type: none"> • The spaces provided for a wheelchair with a maximum dimension of ≤700 mm width and ≤1200 mm length. • Double-barrelled hand holds to the rear of both wheelchair spaces must be 300 mm clear of the floor with the vertical support to the floor no more than 500 mm out from the wall. This provides additional foot space for a passenger in a wheelchair to manoeuvre into and out of the wheelchair space, as well as space providing sufficient space for a service dog. 
WEIGHT RESTRICTION	<ul style="list-style-type: none"> • Weight restriction of 300 kg, including wheelchair and passenger.

SB/DD	<ul style="list-style-type: none"> To carry one wheelchair.
MB/LB/VLB	<ul style="list-style-type: none"> To carry two wheelchairs.
RESTRICTIONS	<ul style="list-style-type: none"> Powered mobility scooters and segways are not classed as a wheelchair and are not able to be carried due to their dimensions and restricted manoeuvrability. This restriction may be revisited at the next three-yearly RUB review, if evidence that more suitable (weight and dimensions) mobility scooters have become more widely available.

4.5. Floors

SLIP RESISTANCE	<p>All floor surfaces must use a slip resistant material with, particular attention paid to its effectiveness in the entry and exit door areas, including the wheelchair ramp, and areas designated and signed for wheelchair users, priority seating and floor-positioned luggage areas.</p> <p>A slip resistant material means it meets one of the following criteria:</p> <ul style="list-style-type: none"> ISO 7176-13 / AS 3696.13 coefficient of friction between 0.75 and 1 ASTM D2047 ≥ 0.6 Wet pendulum (TRRL, British Pendulum, PTV) ≥ 35 AS 4586 $\geq P4$ DIN 51130 $\geq R10$ Surface microroughness $\geq 20 \mu m$ <p>Ramps, when deployed, must have greater slip resistance than flat areas (refer to Ramps).</p>
CONTRASTING COLOURS	<p>Floor surfaces in the priority area must use easily seen contrasting colour flooring material, which contrasts to the flooring of the rest of the main saloon, including under the other passenger seats and any luggage areas. See also Visual contrast.</p>
SIGNAGE	<ul style="list-style-type: none"> “Please stand behind this line” floor insert or sticker to be positioned on the floor in the central aisle immediately behind driver’s seat. Wheelchair signage as a flooring insert is required in addition to a sidewall-mounted wheelchair sign, which must clearly state that the wheelchair user must apply the wheelchair’s brakes and use the wheelchair restraint (if fitted), at all times when the bus is moving. Refer to section above.
SB	<ul style="list-style-type: none"> Flat, or nearly flat, floor from front entry to immediately forward of rear axle is required.
MB/LB/VLB	<ul style="list-style-type: none"> Flat, or nearly flat, floor from front entry to rear edge of the rear door or immediately to the front of the rear axle if only one door. (i.e. no steps) Behind the rear door or rear axle stepped access (preferably a maximum of two, excluding any step access to the rear seat) in conjunction with sloping floors are acceptable.

4.6. Aisle width

The manoeuvring width inside the front door entrance, fare paying and turning area must be at least the same as the aisle width between the wheel arches and up to the rear of the multi-use wheelchair space. There must be unimpeded access for a wheelchair and pram through the front wheel arches to at least the front edge of the rearmost set of priority seating or the rear of the wheelchair space.

SWEPT PATH THROUGH ENTRANCE TO REAR OF WHEELCHAIR /MOBILITY DEVICE/PRAM AREA	SB: ≥780 mm and such that a representative 700 mm wide x 1200 mm long x 1350 mm high box can pass through)
	MB/LB/VLB: ≥800 mm and such that a representative 700 mm wide x 1200 mm long x 1350 mm high box can pass through)
AISE WIDTH FROM FRONT EDGE OF REARMOST SET OF PRIORITY SEATS	≥450 mm* for all buses *can be reduced to ≥440 mm in upper deck of DD
SHOULDER ROOM IN AISLES (above the seat back)	≥550 mm* * flexible grab handles can encroach on this requirement

4.7. Seating design

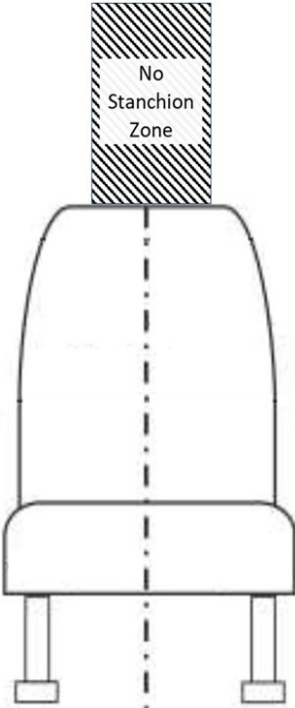
Seating must consist of a fabricated frame or moulded shell which must contain a flat bench style or minimally contoured squab, or padded insert style seat. A single layer unpadded fabric or synthetic material liner is not acceptable.


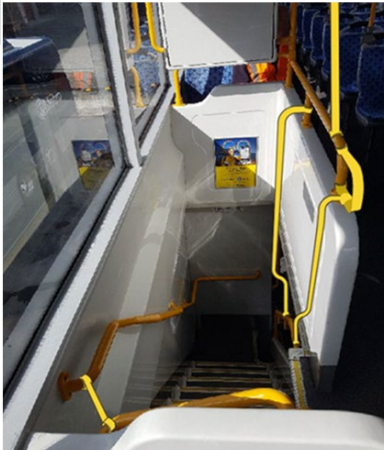
All materials must be vandal, fire, stain and odour resistant. They must also be hard-wearing and easy to clean.

SEAT WIDTH	Single seat: ≥425 mm. Double bench or paired: ≥875 mm. Parent/caregiver and child, on front wheel arch: ≥760 mm.
SPACING	Forward facing: ≥690 mm Facing: ≥1300 mm. Note: the forward-facing seat in the set must have a stanchion on the aisle side and a horizontal handrail on the wall. This may compromise the aisle width in this location, however as it is a safety feature it will take precedence over aisle width requirements.
SEAT CUSHION DEPTH	≥350 mm
SEAT CUSHION HEIGHT FROM FLOOR (may be reduced at wheel arches)	Between 450 mm and 500 mm for priority seating section or 400 mm to 500 mm everywhere else. (can be reduced to 350 mm at wheel arch and engine compartment)

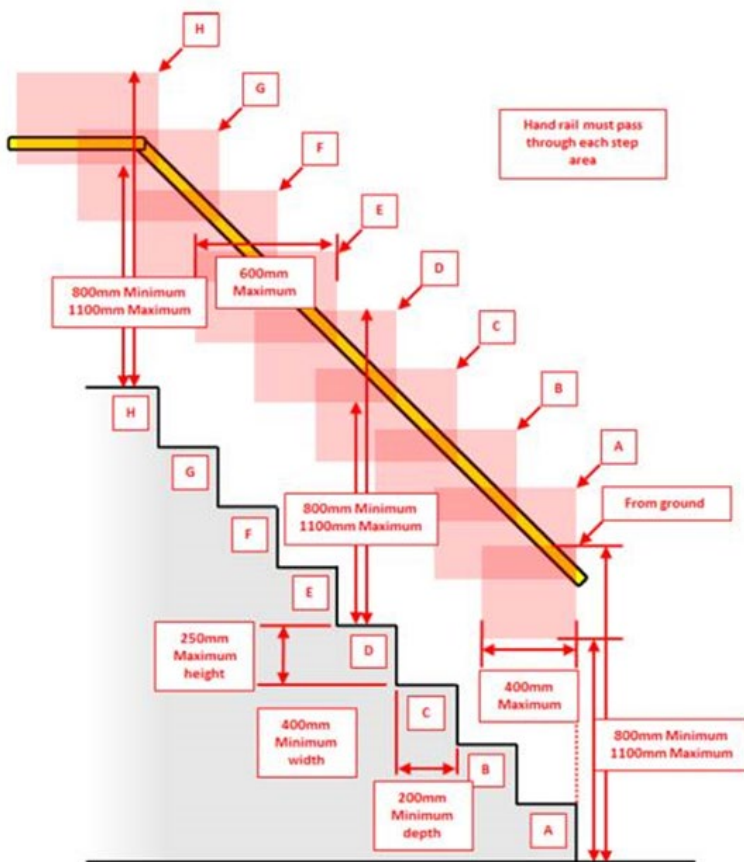
SEAT BACK HEIGHT FROM FLOOR (excluding grab handle)	Between 850 mm and 950 mm
REAR SEATS	The rear row of seats must be constructed so that there are no gaps between the seats and the rear wall, and around the sides or between separate seat sections.

4.8. Stanchions/handrails

LOCATION	<p>Vertical high-visibility contrasting yellow colour (see Visual contrast) stanchions from either floor to ceiling or seatback to ceiling, as location dictates, shall be fitted throughout the length of the bus and close to the aisle, but not impede movement along the aisle or within the wheelchair/multi-use space (e.g. floor-mounted stanchions can hinder wheelchair users' manoeuvrability).</p> <p>There must be no finger trap points in any locations where a passenger may use a stanchion, handrail or modesty panel to hold onto. A minimum finger space range of 35-45mm must be provided in these situations.</p> <p>Seat back stanchions must not be placed within 150 mm of the centre line of the seating position to avoid possible head strike (see diagram below).</p>  <p>The diagram illustrates a top-down view of a bus seat. A vertical dashed line runs through the center of the seat back and seat cushion. Above the seat back, a rectangular area is shaded with diagonal lines and labeled 'No Stanchion Zone'. This shaded area is centered on the dashed line, indicating the prohibited zone for stanchion placement to prevent head strikes.</p>
SPACING ON SEATS	<p>Except in the multi-use/wheelchair space and priority seating area, the stanchions must be spaced at alternate seats left and right of the aisle, and so that a passenger can stand safely or walk/move through the remainder of the bus while able to hold a stanchion with one hand at all times. This includes in the rear saloon, and upper saloon area for a DD. Additional overhead horizontal handrails are allowed (see paragraph below).</p>

MEASUREMENTS	<p>Overhead contrasting colour handrails must be at a minimum of 1900 mm from floor level; if higher, they must be fitted with fixed strap hangers spaced at approximately 380 mm apart.</p> <p>Stanchion/handrail maximum cross-section dimension must be in the range of 30–35 mm and must be of a circular or elliptical cross section.</p> <p>For stanchions and handrails, e.g. on the doors, in the fare paying area or on the top face of the front wheel arches, or within the multi-use/wheelchair space, they must have a finger/hand clearance space of between 35 and 45 mm between any part of the vehicle, and all parts of a handrail other than its mountings.</p>
HANDRAILS	<p>In entry and exit areas, and the fare paying area, or areas where vertical stanchions are impractical, contrasting colour handrails must be provided in the following locations:</p> <ul style="list-style-type: none"> • front dash board; • sidewall between facing seats and wheelchair areas; • modesty panels; • front doors; • horizontal handrail in exit and wheelchair area; and • wheel arch/luggage area.
DOUBLE DECKER	<p>For DD – A modified stairwell handrail or alternative solution to reduce the risk of passenger falls. This must include:</p> <ul style="list-style-type: none"> • Vertical stanchions fitted in the stairwell and immediately next to it on top and bottom decks (Pics 1, 2 and 3 below) • Fitment of additional vertical handrail on sides of the stairwell • All other handrails in the staircase to be continuous to stop passengers having to let go of the supporting handrail while walking up and down the stairs. <p>Note: Handrails as per sample pictures from Auckland and Hong Kong buses below would be acceptable.</p> <p><i>Vertical stanchions on both sides of the stairwell are required.</i></p>  <p><i>Handrails and their ideal positions</i></p>  <p>AT Trial DD Bus</p>

In this example, the fitment of the handrail is too low. The fitment of handrails in the stairwell must be at an appropriate level to avoid passengers walking down the stairs having to reach down, which changes their centre of gravity.



The diagram above shows required measurements for the handrail in the DD stairwell.

4.9. Grab handles on seat backs

All forward or rearward-facing seats must have a grab handle that is accessible from the aisle side. Additional grab handles on the faces of wheel arches can also be beneficial.

DESIGN	As with stanchions and handrails, all grab handles shall be of the same high-visibility yellow colour material. For contrast refer to guidance for step and plinth edges and Visual contrast .
MEASUREMENTS	Grab handles should have a circular or elliptical cross section. Finger and hand clearance space must be 35 to 45 mm . The length must be at least 120 mm , which is easier to grasp in a moving situation.

4.10. Internal lighting

LIGHTING TYPE	<ul style="list-style-type: none"> Energy-efficient, substantially white lighting is required.
MEASUREMENT HEIGHT	<ul style="list-style-type: none"> These should be measured at a height of 1000 mm above the floor level (or each step in a DD stairwell) throughout the aisle of the bus. (Commercially available self-calibrated lux level meters are the recommended measurement method.)
SPECIFICATIONS: DOORWAY STEPS	<ul style="list-style-type: none"> For all doorway step areas, and externally downwards and outwards for ≥ 300 mm beyond the step edge to a level of ≥ 100 lux. Extinguished on door closure and prior to moving off. <p>Note: this should be measured at ground level below the doorway centre point and on the step edge to ensure maximum visibility.</p>
FARE PAYING AREA	<ul style="list-style-type: none"> ≥ 65 lux – extinguished on door closure and prior to moving off. The light should be directed away from the driver in this area.
GENERAL SALOON	<ul style="list-style-type: none"> Light levels in the general saloon area (including top deck), from immediately behind the driver's modesty panel, should be adjustable by the workshop. From a minimum of 20 lux to a maximum of 100 lux.
DD STAIRWELL	<ul style="list-style-type: none"> ≥ 65 lux.
LIGHTING SYSTEM CONTROL	<ul style="list-style-type: none"> Must be fitted with automatic sensors to ensure the interior lighting is automatically switched on/off to maintain the minimum requirements. The lighting system must not be controlled from the driver's position or connected to the exterior lighting system. Lights to increase in general saloon to ≥ 65 lux when doors open to allow passengers to easily locate their seats and dim again once doors are closed with a 5 second delay.

4.11. Security and safety

CCTV	General	<p>NOTE: it is important that the guidelines on the use of CCTV systems produced by the Privacy Commissioner are followed.</p> <p>The CCTV System shall, without any requirement for manual intervention or downloading, store recorded images from all cameras at the required frame rates and resolutions for a period of not less than 21 days at 10 hours operation per day. Where a CCTV System is installed on a bus operating a continuous/near to continuous service, the system requirement shall extend to a minimum of 14 days of the extent of the service.</p> <p>The CCTV System shall commence recording using all cameras within three (3) minutes whenever the bus's ignition is activated and is to continue recording for a period of at least fifteen (15) minutes after the ignition has been deactivated.</p> <p>Recordings may be overwritten when the storage medium reaches its recording capacity, unless tagged because of a duress (panic) alarm. Overwriting of recordings shall occur with the oldest recorded video overwritten first, ensuring that the most recent recording is preserved.</p>
	Digital video recorder (DVR)	<p>An indicator must be installed within the normal field of view of the driver so the status of the DVR and CCTV can be confirmed.</p> <p>The DVR shall utilise hard-disk or solid-state recording media that does not require routine replacement or exchange in order to meet the storage requirements.</p> <p>In replaying video from any camera, it shall be possible to clearly identify the following information from the image and/or embedded data:</p> <ul style="list-style-type: none"> • bus on which the recording was made; • camera location on the bus; • the date and time of the recording; and • the status of the duress alarm. <p>The DVR and cameras must be capable of the following minimums for day and night recording:</p> <ul style="list-style-type: none"> • Analog cameras D1 (704 x 576) @ 25 fps, and • IP cameras 720 p (1280 x 720) @ 25 fps.
	Cameras	<p>Cameras and their housings shall be mounted in such a manner so as to ensure that they are:</p> <ul style="list-style-type: none"> • visible and identifiable as a camera; • unlikely to be accidentally knocked by passengers during normal boarding procedures; • not adversely affected by the use or repositioning of sun visors, mirrors or other equipment; and • not susceptible to misalignment of the field of view. <p>CCTV cameras shall provide colour video where the scene luminance is above five (5) lux and may switch to monochromatic images to maintain the quality of recorded image where the available light falls below the day/night threshold of the camera</p>

Camera placement

SB – A minimum number of cameras installed so the field of view and configuration enables monitoring of the following areas:

1. entrance platform and passenger/driver interface;
2. from the front of the saloon area looking rearwards covering rear seated areas;
3. forward facing to road ahead of the bus; and
4. kerb side camera facing towards the rear monitoring door activity.

MB/LB/VLB – A minimum number of cameras installed so the field of view and configuration enables monitoring of the areas above plus the following areas:

5. exit area providing the driver with an unobstructed view of rear door to ensure passengers are well clear of the door before it is operated - mounted above the door looking down, so that the door is completely visible up to the 'no standing line';
6. rear of interior seated area looking forwards, covering rear seated areas; and
7. between the rear door and the front door of the bus - mounted either at the front looking rearwards or at the rear door looking forwards (or ideally both) and covering the wheelchair spaces.

DD – A minimum number of cameras installed so the field of view and configuration enables monitoring as for MB/LB/VLB above, plus the following areas:

8. from the rear of the upper saloon area looking forwards covering rear seated areas;
9. the top of the stairwell directed down the stairwell; and
10. from the front of upper saloon seated area looking rearwards.

Audio recordings

A microphone shall be installed in the vicinity of the driver's cab and connected to the audio input of the DVR, such that audible sounds of conversations and other activity that occur within 2 metres of the driving seat.

Whenever audio is recorded on the CCTV System, it shall be synchronised with the digital video recording, and able to be played back with the video.

	<p>Driver's monitor</p> <p>The CCTV System must incorporate a 7" monitor, as a minimum, into a console within the field of view of the driver. This driver monitor may be used as a reversing camera monitor through automatic switching of the rear camera. The driver's monitor must have a test button or similar facility to allow the image from all cameras to be checked at any time.</p> <p>The monitor to be configured to allow the monitoring of all the views below simultaneously.</p> <p>DD</p> <p>Rear and/or front door open</p> <ul style="list-style-type: none"> • Stairs • Top level • Rear door inside <p>Doors closed and driving m</p> <ul style="list-style-type: none"> • Top deck view that also covers the entrance to the stairs • 3x blind spot cameras (reverse cameras) <p>Single deck</p> <p>Rear and/or Front door open</p> <ul style="list-style-type: none"> • Rear door inside • Rear internal camera that looks forward • Wheel chair position <p>Doors closed and driving</p> <ul style="list-style-type: none"> • 3x blind spot cameras (left flank, right flank and reverse cameras) • One camera providing an internal view of the saloon must be provided, to give the driver an alternative view to what he/she can see through the internal mirror.
TELEMATICS	<p>Telematics systems must be included.</p> <p>Telematics must be able to monitor factors affecting passenger comfort; braking, acceleration, cornering and speeding. It must give the driver real-time feedback and enable incidents to be recorded and traceable to a particular driver.</p> <p>Fatigue/distraction detection and driver alert system must be installed and actively monitored.</p>
REVERSING SYSTEM	<p>Buses must be installed with a reverse monitoring system which includes:</p> <ul style="list-style-type: none"> • reversing camera (this could be part of the CCTV system, but does not need to be recorded), • reversing sensors, • reversing buzzers, and • hazard light activation upon the engaging of reverse gear.
BLIND SPOT CAMERA SYSTEM	<p>Buses are to be fitted with an external blind spot camera system. These cameras need not be recorded by the CCTV system but can be shared with the CCTV and reversing systems. The images are to be provided in real time to the driver at all times. This requires:</p> <ul style="list-style-type: none"> • Cameras that can provide a rear looking view of both sides of the bus from at least the front axle rearward. • A rearward looking view from the rear of the bus.
DD UPPER BODY PROTECTION	<p>Upper deck 'tree guards' on both sides of the bus to deflect obstacles and offer protection to the bus superstructure are mandatory.</p>

DD PASSENGER SAFETY	<p>Contrasting, easily seen signage (visible at the bottom and top entry points to the stairwell) with the words: 'Passengers must not stand in the stairwell when the bus is in motion' must be fitted.</p> <p>An upper deck passenger counting system is required so that passengers on the lower deck know if any seating positions are available on the upper deck before entering the stairs. There must be an indicator at the bottom entry to the stairs that indicates the number of seating positions available on the upper deck. A duplicate indicator is to be fitted so that it is visible to the driver. A driver reset is required.</p> <p>Contrasting easily seen signage (visible at the bottom entry point to the stairwell and at the top of the stairs) with the words: 'Passengers must not stand on the upper deck' must be fitted.</p>
----------------------------	---

4.12. Heating, ventilation and air conditioning (HVAC)

Full air conditioning climate control is mandatory for all new urban buses.

REQUIREMENTS	<ul style="list-style-type: none"> There must be provision of a separate air conditioning system in the upstairs saloon of the DD. Provision of effective climate control is of greater priority in the upper saloon area because of the lower ceiling height and generally more confined/enclosed nature of the environment. Ensure vents are not directed at passengers.
DRIVER CONTROL	<ul style="list-style-type: none"> Systems that are independent of the driver adjusting settings are required. The driver must not have control over vehicle HVAC settings.
TEMPERATURE: SALOON	<ul style="list-style-type: none"> The set-point of the temperature within the saloon areas is to be maintained at a temperature of 20°C +/- 2°C, when the bus is operating in an environment from 0°C to 30°C. This temperature must be achieved within 20 mins of vehicle start-up.

4.13. Demisting

REQUIREMENTS	<p>Demisting should be achieved:</p> <ul style="list-style-type: none"> within 20 minutes in the main saloon front and rear door glass and all windows; and maintained during service at all times.
---------------------	--

4.14. USB power ports

REQUIREMENTS	<ul style="list-style-type: none"> One double USB power port must be provided for every pair of seats. Ports must be fitted on each row of seats, accessible to both passengers without a passenger needing to reach past each other. In the wheelchair accessible spaces, one single USB power port must be provided on the wall next to the fold-up seat.
---------------------	--

5. COMMUNICATION

5.1. Requirements

REQUIREMENTS

- The two-way radio communication system shall enable communication between the bus and back to base depot and to any central information or control centre. The system must be capable of broadcasting to all or to individual buses from the base depot, central information or control centre.
- A covert panic duress button must activate the system to tag the CCTV and start the audio recording. In addition, for fleets with more than 5 buses, open a radio channel to enable the operator control centre to hear the conversation on the bus. Note this channel must not be broadcast beyond the affected bus and the operator control centre.
- A public-address system capable of broadcasting driver announcements to passengers.

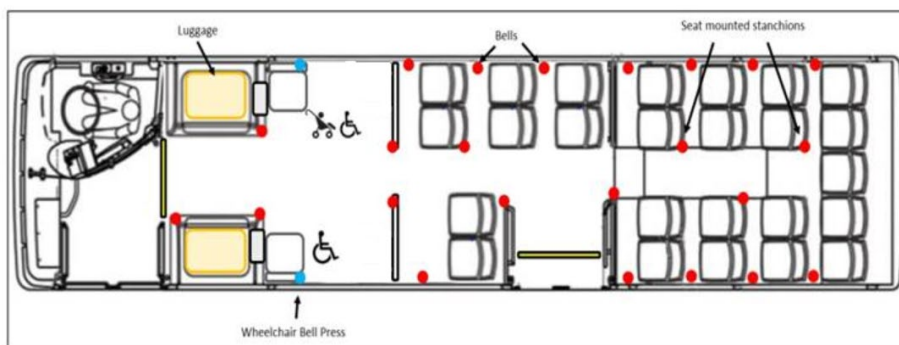
5.2. 'Bus stopping' electronic signs and buttons

All buses must be fitted with dual-indicator bus stopping signalling and acknowledgement display devices that are easily seen and heard by the driver and the passengers in all areas of the bus saloon. (This includes the upper saloon of an DD). Signalling devices must be in easy reach of all passengers whether seated or standing.

PLACEMENT OF BUTTONS

Bus stop buttons must be in easy reach (but not able to be accidentally triggered) of all passengers whether seated or standing as follows:

- easily reached by any person seated in a priority seating area or wheelchair area without having to stand up, e.g. fitted on side walls below the window frame or on stanchions or horizontal handrails;
- easily used by elderly and disabled people with poor hand and finger function or dexterity;
- shall be mounted to the walls or window ledge, between every row of seats and adjacent to and not less than every second row of seats on both sides of the aisle (on stanchions) as depicted by the image below;



- on the vertical stanchions at a minimum of 1300 mm and a maximum of 1600 mm above floor level; and
- must not be activated by horizontal cordage.

AUDIO-VISUAL INDICATION TO DRIVER	<p>The device shall trigger both an audible and visual indication to the driver, and passenger. For the passenger saloon there shall be at least two illuminated bus stopping signs (to meet the needs of people with a visual impairment, a mix of upper and lower-case characters is strongly preferred) with associated audible acknowledgement signals.</p> <p>The signs shall consist of one rearward facing to the saloon adjacent to the driver's area and a second forward and rearward facing repeater located near the rear door to acknowledge the request. This sign shall remain illuminated until cancelled by the operation of the door controls.</p> <p>The driver's dashboard indicator shall have two components: a general signal and a second signal to indicate to the driver that the signal has been made by a passenger occupying the wheelchair position to enable the driver to prepare for ramp deployment at the next stop.</p>
DESIGN	<p>Bus stopping request devices shall be installed on the high-visibility yellow stanchion, with a high-visibility mounting holding a red push signal button, for example, the picture below depicts a button with braille on it for blind or vision-impaired passengers:</p>  <p>Bus stopping request devices in the wheelchair space shall be of a high-visibility yellow mounting holding a dark blue push signal button clearly marked with a wheelchair icon to prevent unintentional activation by able-bodied passengers.</p>

5.3. External destination display

Clear information of the bus route, destination and intermediate points form an essential part of generating passenger confidence.

SPECIFICATIONS	<ul style="list-style-type: none"> • Signs must be of the electromechanical or electronic matrix style, fitted with amber or white (front only) LED/LCD displays, with emphasis on high visibility during all light levels. • Rear sign must be amber LED/LCD displays. • Signs must be able to be easily read by the majority of sighted current or potential passengers as the bus approaches or departs. For visibility requirements, refer to 7.2. • Signs must be able to switch between secondary destinations. • All letters must be in lower case, except for the first letter, e.g. Lower Hutt. • Dot matrix must not be used.
-----------------------	---

ALL BUSES	<p>All buses shall have the following signs:</p> <ul style="list-style-type: none"> • Front forward-facing three digit/character route-number and destination combination sign a minimum of 1500 mm wide located at or above the top of the windscreen. • Near side, as close as possible to the front entrance, a route number and destination display, at a height of not less than 1.2 metres to the lower edge of the display characters and not more than 2.5 metres to the upper edge of the display characters measured from the ground and, if fitted with a kneeling system, with the vehicle in the normal condition for vehicle travel. <p>At the back of the bus a three digit/character route-number and destination combination sign a minimum of 1500 mm wide and a minimum of 2000 mm above ground level and central or left of centre, i.e. toward the nearside of the bus.</p> <p>Front forward-facing:</p> <ul style="list-style-type: none"> • The glass fitted in front of all destination signs must be clear. • The destination display light sensor must be fitted towards the bottom of the display so that it has access to direct sunlight.
MESSAGE CONFIGURATION	<p>Front and rear route number characters must be a minimum of 200 mm high.</p> <p>Front and rear primary destination characters must be a minimum of 125 mm high and secondary destination characters a minimum 90 mm high.</p> <p>Side route number and destination characters must be a minimum of 70 mm high. Message scrolling needs to be full word, not by character. Where information cannot fit onto a single screen, additional information should page (alternate), not scroll.</p>
EXTRA DESTINATIONS	<p>The sign must be controlled by the driver from the driving position and be capable of storing a range of different route and destination information as well as displaying whether the bus is not in service, on charter, school or special work.</p>

5.4. Exterior promotional area

The entire rear of the bus, apart from destination display and school bus sign space, must allow for the placement of promotional material. All ventilation grills must be designed to not disturb the image when viewed from the rear of the bus. Emergency exits and windows, as well as legally required lights, must not be covered and bus (fleet) numbers must be clearly visible at all times.

5.5. Internal information

Buses must be equipped with provision for power and cabling to allow for LCD screens to enable visual and audible automated progressive route and journey-related information and announcements. Progressive route and journey-related information presented on an electronic information display provides vital information on the route being taken and the current location of the bus. This information provides confidence to the user and helps to ensure they do not find themselves getting off at the wrong stop which also may present safety issues, particularly at night.

ELECTRONIC INFORMATION DISPLAY	<ul style="list-style-type: none">• LCD screen size to range between 20-22" (510-560 mm).• Two Category 6 cables per monitor - both cables to be terminated with RJ45/568A.• Draw cables to be easily accessible for the retrospective laying in of cables between the passenger information screens and media enclosure.• The media enclosure needs to allow a space of 300 mm wide, 300 mm deep and 200 mm high for a media unit. The future location of screens will be as follows and there shall be an enclosure provided for the future fitting of a media player. <p>Screen placement locations:</p> <p>Single deck – 3 screens:</p> <ul style="list-style-type: none">• One screen fitted to the rear of the driver's partition facing rearward.• Two screens - one facing forward visible to the rear-facing wheelchair passengers in the wheelchair bays, and one facing rearward, fitted to the offside of the bus. <p>DD – 4 screens:</p> <ul style="list-style-type: none">• One screen fitted offside of the bus facing rearward (at the back of the stairwell).• One screen fitted to the side of the stairwell, facing the wheelchair position.• Two screens on the upper deck, one fitted to the front windscreen and the other to be fitted to the rear of the stairwell, facing rearward. <p>Note that the positions selected for the screens must avoid reflection on the windscreen that is visible to the driver.</p>
AUDIO ANNOUNCEMENTS	<ul style="list-style-type: none">• Eight speakers are to be fitted equally spaced throughout the bus on all levels directly above the seats. There needs to be a speaker directly above wheelchair positions, priority seats, and the second row of seats from the rear of the bus of both decks of the bus.• Speakers are not to be fitted in or near the driver's compartment.• The speakers for a DD bus need to be wired so that the volume can be set at different levels for upper and lower decks. The speakers are to be connected to the media enclosure.

6. EXISTING BUSES

6.1. Introduction

There are a large number of buses used in the urban bus fleets that have been purchased over the last 20 years. Some of the more recent ones will meet or exceed all or most of the criteria listed in this document for new buses, but many of the earlier purchases will not.

Waka Kotahi encourages operators to speed up the replacement of the older less user or environmentally friendly vehicles, and to retrofit as many of the features in the previous sections as is possible.

Existing buses aged between 20 and 23 years old may be used for school only use with prior local authority approval, providing evidence is provided of a planned replacement programme.

6.2. Existing bus standards

Existing buses: all buses currently used in urban services shall meet the following requirements (also refer to sub-section 1.2.3):

ACCELERATION	0-50 km/h ≤30 seconds.
EMISSIONS	As per the RUB when bus entered urban service, Euro 3 emissions standard a minimum.
TRANSMISSION	LB automatic.
SUSPENSION	LB Full air with levelling.
DOORS	SB: 1. MB/LB/VLB: 2 mandatory - if ≥36 seating positions. Front door width ≥700 mm.
STEP HEIGHT	≤370 mm.
FLOOR AND LEVELS	Non-slip material in boarding and aisle area. No more than two steps in the aisle along whole internal length of vehicle excluding any footrest plinth to the rear seats.
STEP EDGE	Highlighter to top edge of nose.
STANCHIONS/HANDRAILS	One close to each door plus at least two in each saloon area, ie forward of rear door and behind rear door.
GRAB HANDLES	On aisle side of all seat backs.
HEATING AND VENTILATION	Drivers area plus ≥2 saloon heaters.
DEMISTING	Front windscreen and front door windows.
BUS STOP REQUEST	Bell push within reach of seated and standing passengers in every second row of seats. Illuminated bus stopping display with audible signal.
DESTINATION	Front route no – three characters ≥100 mm in height. Front and side destination characters ≥60 mm in height.

6.3. Midlife refurbishment requirements

At the midlife of a bus (8–10 years) it is expected that buses are refurbished to the requirements of this version of the RUB 2020 – this may be negotiated between the operator and regional council. The bus will remain in the same size category after this refurbishment, independent of the number of seats.

REQUIRED	<p>At midlife refurbishment, the following must be updated to this version of the RUB:</p> <ol style="list-style-type: none">2. DESIGN AND PERFORMANCE<ol style="list-style-type: none">2.3. Performance (only the hold brake / interlock)3. VEHICLE ENTRANCE AND EXIT<ol style="list-style-type: none">3.1. Ramp3.2. Ticketing/fare collection area3.5. Step and plinth edges4. VEHICLE INTERIOR<ol style="list-style-type: none">4.1. Driver compartment4.2. Driver operational communication4.5. Floors4.6. Aisle width4.8. Stanchions/handrails4.9. Grab handles on seat backs and elsewhere4.10. Internal lighting4.11. Security and safety5. COMMUNICATION<ol style="list-style-type: none">5.1. Requirements5.2. 'Bus stopping' electronic signs and buttons5.4. Internal information<ul style="list-style-type: none">• Seat upholstery
OPTIONAL (AT COUNCIL'S DISCRETION)	<p>Wall lining Ceiling panels</p> <ol style="list-style-type: none">4.3. Priority seating area4.4. Wheelchairs4.7. Seating design<ul style="list-style-type: none">• Fire suppression

7. APPENDIX

7.1. Items not included

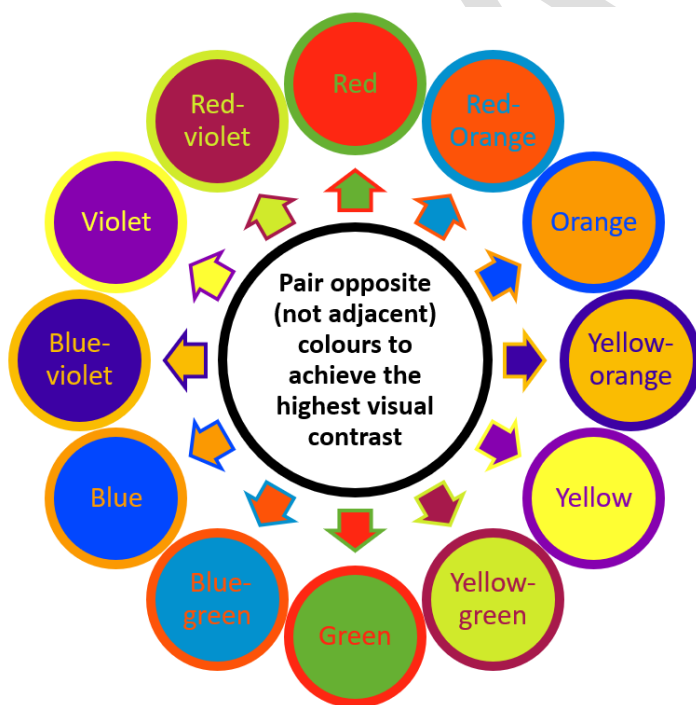
Waka Kotahi is also aware that there are other issues that are as important as vehicle design and construction. One example is the quality of the infrastructure that enables use of a public transport system, e.g., bus stop location and design, kerb heights and facilities (e.g., in terms of weather protection), information, suitability for use by persons of all ages and capabilities, and ease of transfer opportunities. However, defining the infrastructure requirements is not included as part of this document, nor is driver training.

As part of a programme of work designed to improve the effectiveness of public transport, Waka Kotahi has developed bus stop infrastructure guidelines to apply nationally which borrow heavily from the extensive work completed by Auckland Transport on bus stop design and facilities. This document can be found on the Waka Kotahi website by searching for 'guidelines for public transport infrastructure and facilities'.

Waka Kotahi worked with the BCA back in 2011 to develop and roll out a customer service training programme for bus operators to use for driver training. The resources and tools are available through the BCA and are free to its members.

7.2. Visual contrast

70 percent minimum visual contrast is required. Greatest contrast is achieved by choosing opposite (not adjacent) colours of the colour wheel. For example, red and orange are not contrasting whereas red and green are contrasting. For more information, refer to [RTS 14](#) section 5.3.




Blind Low Vision NZ (formerly the Blind Foundation) and the Association of Blind Citizens of New Zealand recommend the use of safety yellow as the colour that is most easily distinguished by the visually impaired (refer to subsection 3.4), and for this reason it is mandatory.

The steps' high-contrast nosing in the horizontal and vertical planes is to be within the range of 45–50 mm. See the Blind Low Vision NZ's accessible signage guidelines (<https://blindlowvision.org.nz/how-we-can-help/services-for-business/#sign>).

7.3. Bicycle racks

Bike racks are optional (at Council's discretion), but if fitted, they must meet relevant regulatory requirements and must meet the following:

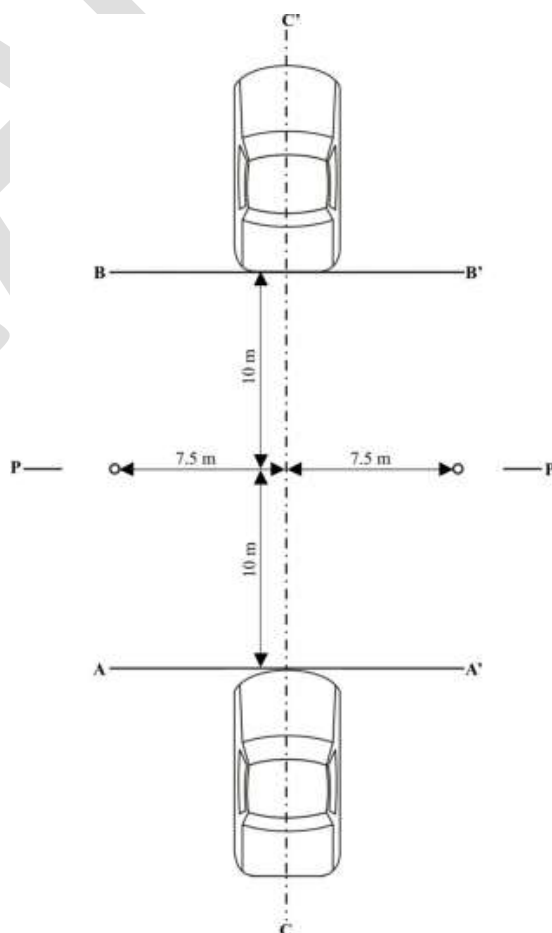
LOCATION OF RACK AND MEASUREMENTS	<p>Bicycle racks must be placed on the front of the bus with the number plate and/or school sign clearly showing (as shown in the pictures below).</p> 
WEIGHT AND TYPE RESTRICTIONS	<p>Bike racks must carry a minimum of two standard bikes at a time. They must accommodate a bike of up to 25 kg and wheels between 40.5 cm (16") and 75 cm (29") diameter.</p> <p>The following bike types and accessories do not have to be accommodated on the racks:</p> <ul style="list-style-type: none"> • Cargo-type bikes - they do not fit in the bike racks • Bikes with fat tyres - they also do not fit in the bike rack • High-backed child seats, or any bikes/bike accessories that can obstruct the driver's visibility are not allowed for safety reasons.

7.4. Noise measurement

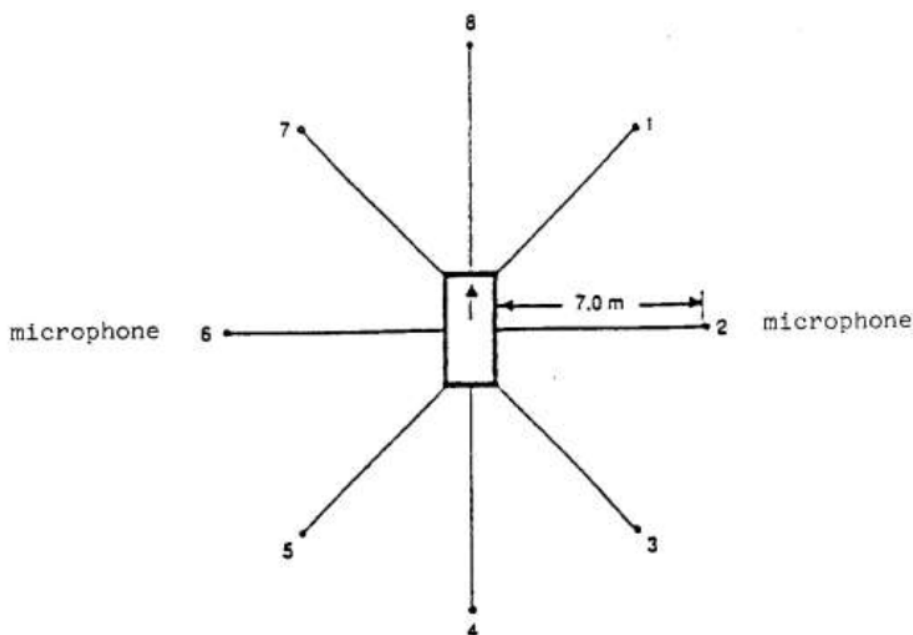
Bike racks are optional (at Council's discretion), but if fitted, they must meet relevant regulatory requirements and must meet the following:

7.4.1. External noise measurement for vehicles in motion

At least four measurements shall be made on each side of the vehicle. The microphone shall be located at a distance of 7.5 m \pm 0.05 m from the reference line CC' of the track and 1.2 m \pm 0.02 m above the ground.



Microphone placement diagram from UN/ECE Reg. 51, Annex 3 – Appendix, Figure 1.



Air brake noise measurement: Microphone positions from UN/ECE Reg. 51, Annex 6 – Appendix, Figure 1

7.5. Process for seeking a variation to these requirements

7.5.1. RUB and the Waka Kotahi procurement rules

Using the RUB is a Waka Kotahi requirement through the [Procurement manual](#), procurement rule 10.31 (see below). Note: Failure to comply with these procurement procedures for urban public transport services will be considered a breach under section 36 of the LTMA. Note that the Planning and Investment Knowledge Base also requires approved organisations to comply with the RUB to qualify for NLTP consideration, by following the Waka Kotahi *Procurement manual*: for the activities funded through the National Land Transport Programme and procurement rules, as well as any relevant standards or guidelines listed in the Waka Kotahi Register of network standards and guidelines (in this case the RUB).

10.31. Procurement Rule

1. All urban bus public transport unit contracts must incorporate the vehicle standards contained in the Requirements for urban buses in New Zealand: New Zealand's common standard for urban bus quality (RUB).

7.5.2. Guidelines

The RUB has been developed in collaboration with regional councils, the Bus and Coach Association, operators, bus builders and suppliers. User groups were also consulted as part of its development.

As determined by this current review, the RUB will be the standard for all urban buses in New Zealand and that the dimensions and features in the RUB are accepted by all regional councils as a prerequisite for receiving Waka Kotahi investment.

The RUB will be reviewed every five years or from time-to-time as a need is identified by the sector. The most recent RUB update must always be used in tenders and this can be found at Requirements for urban buses in New Zealand: New Zealand's common standard for urban bus quality (RUB). In addition, all urban bus public transport units must consider the additional matters and good practice as set out in the RUB.

Any regional council or operator or manufacturer wanting to depart from the requirements of the RUB must first apply to the Waka Kotahi Public Transport Manager for approval, using normal processes for a variation to a procurement procedure. The approval process will involve engagement with the RUB industry working group on the proposed variation. A public record of all changes will be maintained also,

Any more significant variation will require the involvement of either the relevant Group Manager or the Waka Kotahi Board.

It is possible that some services may require a higher or different standard of vehicle to operate temporarily, or for a longer period of time, e.g. some high-frequency inner-city routes may be better served by a wider rear door or provision for more standees. It is also possible that the RUB may require variation to capitalise on an improvement in technology. Waka Kotahi is keen to see bus companies and regional councils seek to utilise any benefits that flow from technological advances which improve safety, access or environmental aspects.

Also, in some regions, buses may be used to provide regular services to satellite or dormitory areas and a different/lower specification might seem justified. However, with one exception (i.e., accepting a single door at the front for longer distance), Waka Kotahi does not see a need to relax the requirements set by the RUB for buses operating such services, unless the roading or terrain is such that the operation of buses complying with this specification is not practical (in which case a specific variation application could (and should) be sought. This situation aside, the RUB will continue to apply to the services described above in order to maximise the opportunity to promote public transport as a means of travel to the maximum range and number of people. This is expected to occur because:

- people with disabilities can also be expected to use these services, and
- buses on these routes can be expected to pick up and set down passengers as they move in and out of the urban area and these passengers will expect the buses to be of a similar standard to those used within the urban area.

Moreover, we understand from discussions with public transport operators that there are likely to be times when the bus company running the services described above will want to use the buses on those services on urban services instead, in order to maximise bus utilisation.

8. FUTURE INTENTION

8.1. Future technologies intended to be required (in no particular order)

- Fatigue/distraction detection and driver alert system.
- Cyclist detection system.
- Acoustic vehicle alerting system on electric bus to alert blind and low-vision pedestrians.
- Autonomous braking.
- Non-carbon fuelled buses, e.g. electric and hydrogen-fuelled.
- Lane-keep assist.

DRAFT