

Apply for a Vehicle Approval Code (VAC) through Vehicle Inspection and Type Approval System (VITAS) to register a Bus

Ensure that your bus meets the technical requirements for bus in **Annex A**.

You must submit an application for vehicle approval to LTA through VITAS. You need to pay an application fee of \$274.68.

To ensure sufficient time for registration of **imported used bus**, you must submit the VITAS application at least 3 months before it reaches 3 years old.

Please refer to VITAS website (<https://vrl.lta.gov.sg/certlogin.html>) for more details on opening a user account and application procedures. If you do not have a registered account, you can write in via our feedback portal (https://www.lta.gov.sg/content/ltagov/en/contact_us.html).

Documents to be submitted for verification include:

- a) Documents to prove compliance with the exhaust emission and noise emission standards such as:
 - Vehicle manufacturer's certificate that the new bus complies with the prevailing exhaust emission and noise emission standards; or
 - Certificate of Compliance on exhaust emission and noise emission standards with test report from NEA/LTA-recognised vehicle testing laboratory (see **Annex B**). The format for Certificate of Compliance and test report is attached at **Annex C** (for Buses maximum laden weight (MLW) not exceeding 3,500kg) and **Annex D** (for Buses MLW exceeding 3,500kg);
- b) All imported used bus must conform to the relevant prevailing exhaust emission and noise emission standards stipulated in the First or Second and Fourth Schedule of the Environmental Protection and Management (Vehicular Emissions) Regulations in order to be approved for registration. The imported used buses will have to undergo an exhaust emission test at NEA/LTA-recognised emission test laboratory (see **Annex B**). For used buses that are tested in a recognised foreign emission test laboratory, they must be imported within 3 months from the date of the emission test certificate/report issued by the recognised foreign emission test laboratory.
- c) Detailed technical specifications of the bus issued by the vehicle manufacturer (e.g. technical catalogue, etc);
- d) Original Manufacturer/Purchase Invoice to state make/model, engine number, chassis number, year of manufacture, engine capacity, unladen weight and MLW; or foreign vehicle registration documents (for used bus). A statutory declaration is necessary if original documents are not available;
- e) Letter of No Objection (LNO) issued by LTA for OBU Compliance;
- f) Bill of Lading; and
- g) Inward Cargo Clearance Permit.

All documents submitted **MUST** be in the English language. Notarised translations are acceptable.

Acceptance of the above documents (e.g. exhaust emission and noise emission test report) are subject to due diligence checks. You should take this into consideration, especially when registering a new vehicle model for the first time.

Once in-principle approval has been given, you will be notified to send the bus for inspection at any LTA-Authorised Inspection Centres (see **Annex E**) where an inspection fee will be charged.

After your bus has passed the inspection, an approval letter with a VAC will be issued to you. With this VAC, you may proceed to register the bus.

Commercial Vehicle Emissions Scheme (CVES)

The CVES was introduced on 1 April 2021 to encourage consumers to choose less pollutive commercial vehicle models that emit lower exhaust emissions and are cleaner overall, thus addressing climate change, improving ambient air quality and protecting public health.

CVES applies to registrations of all new and imported used light commercial vehicles with MLW not exceeding 3,500kg, such as Light Goods Vehicles (LGVs), Goods-Cum-Passengers Vehicles (GPVs), and small buses. Such commercial vehicles registered from 1 April 2021 to 31 March 2027 (both dates inclusive) are classified into Bands A, B or C by their worst-performing pollutant i.e. carbon dioxide (CO₂), carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x) and particulate matter (PM).

CO₂ Emissions and Fuel/Electric Energy Consumption Data for CVES

As part of CVES, all commercial vehicles with MLW not exceeding 3,500kg, such as LGVs, GPVs and small buses, are required to have their CO₂ emissions (in g/km), fuel economy (in L/100km) or electric energy consumption (in kWh/100km) data (where applicable) as tested according to the WLTP-Europe [Commission Regulation (EU) No. 2017/1151] or WLTP-Japan [TRIAS 08-002-02]. The regulated emissions and CO₂ values obtained from the emissions test will be used for the computation of the rebate or surcharge of the commercial vehicles under the CVES. The following documents may be submitted as evidence of compliance with our requirements:

- a) COC issued by the vehicle manufacturer for vehicles type-approved to the European standard;
- b) Vehicle test certificate from designated technical services (e.g. TUV, IDIADA, DEKRA, VCA etc.); or
- c) Full emissions test report with CO₂ emissions and fuel/electric energy consumption data, issued by one of the recognised vehicle emission testing laboratories listed in **Annex B**.

To account for the CO₂ emissions produced by electricity generation from fossil fuels, an emission factor of 0.4g CO₂/Wh will be applied to the electricity consumption of electric vehicles.

a) CVES bandings for CVES-eligible buses registered from 1 April 2025 to 31 March 2027

For CVES-eligible buses registered from 1 April 2025 to 31 March 2027, the full incentive for CVES Band A will be disbursed (or the full surcharge for CVES Band C will be imposed) upon registration.

Light Commercial Vehicles Registered from 1 April 2025 to 31 March 2027							
Band	CO₂ (g/km)	HC (g/km)	CO (g/km)	NO_x (g/km)	PM (mg/km)	Incentive	Surcharge
A	A ≤123	A =0.0	A =0.0	A =0.0	A =0.0	\$15,000	
B	123< B ≤216	0.0< B ≤0.025	0.0< B ≤0.27	0.0< B ≤0.015	0.0< B ≤0.85		
C	C >216	C >0.025	C >0.27	C >0.015	C >0.85		\$20,000

Terms and conditions for receiving CVES incentive are available at <https://go.gov.sg/cves>.

Technical Requirements for Bus

Definition of Bus

Under the Road Traffic Act, a bus must have a seating capacity of not less than 9 passengers (excluding driver).

Compliance with Road Traffic Act and its Subsidiary Legislations

All buses to be registered in Singapore must comply with the Road Traffic (Motor Vehicles, Construction and Use) Rules, Road Traffic (Motor Vehicles, Lighting) Rules and Road Traffic (Motor Vehicles, Seat Belt) Rules.

Exhaust Emission and Noise Emission Standards

The National Environment Agency (NEA) require all buses to be registered in Singapore to comply with the following exhaust emission standards:

Petrol-Driven must be:

Euro 6 (WLTP) or JPN2018 or JPN2023	For vehicles using Port Fuel Injection
Euro 6 (WLTP) or JPN2018 + Euro 6 (WLTP) PN limit ¹ or JPN2023	For vehicles using Gasoline Direct Injection

Diesel-Driven must be:

Euro 6 (WLTP) or JPN2018 + Euro 6 (WLTP) PN limit or JPN2023	For Buses with gross vehicle weight not exceeding 3,500kg
Euro 6 or PPNLT + Euro 6 PM number or J-WHVC + PN limit of 6.0×10^{11} #/km or PPNLT 2023 or J-WHVC 2023	For Buses with gross vehicle weight exceeding 3,500kg

Noise emission of the bus must comply with the standards stipulated in the Fourth Schedule of the Environmental Protection and Management (Vehicular Emissions) Regulations.

¹ From 1 January 2022, NEA will tighten the particle number (PN) limit for gasoline direct injection petrol-driven vehicles from 6×10^{12} #/km to 6×10^{11} #/km. This measure will apply to light commercial vehicles (i.e., LGVs, GPVs and small buses, all with MLW not exceeding 3,500kg) that are registered from 1 January 2022.

Annex A

Page 2 of 7

Evidence of the bus's compliance with the exhaust emission and noise emission standards must be submitted to the LTA. Acceptance of these documents (e.g. exhaust emission and noise emission test report) are subject to due diligence checks. You should take this into consideration, especially when registering a new vehicle model for the first time. The following documents may be submitted as evidence of compliance with the prevailing emission standards:

For Brand New Buses

- a) COC issued by the vehicle manufacturer; or
- b) Letter of certification and test report from the vehicle manufacturer that the bus complies with the required exhaust emission and noise emission standards; or
- c) Get your bus tested and certified by any of NEA/LTA-recognised vehicle testing laboratories (see **Annex B**). The laboratories are required to issue a Certificate of Compliance and test report (see **Annex C or D**) for the bus tested. Evidence of compliance with the exhaust emission and noise emission standards will be waived if it has been registered as a new bus in a foreign country which adopts the same or higher exhaust emission and noise emission standards as Singapore (at the time of its registration as a new bus in Singapore).

For Used Buses

Get your bus tested and certified by any of NEA/LTA-recognised vehicle testing laboratories (see **Annex B**). The laboratories are required to issue a Certificate of Compliance and test report (see **Annex C or D**) for the bus tested. For used buses that are tested in a recognised foreign emission test laboratory, they must be imported within 3 months from the date of the emission test certificate/report issued by the recognised foreign emission test laboratory.

On-Board Unit (OBU) Installation

As part of the shift to the new ERP 2.0 system, LTA requires all buses to be registered in Singapore to comply with the OBU installation requirements except certain groups of buses, such as those under the Restricted Use Vehicle Scheme. An OBU Compliance Form, together with the relevant declaration and/or test report must be submitted by the motor dealer, distributor or importer to LTA for verification. Please refer to **Annex F** for a sample copy of the OBU Compliance Form and the OBU installation requirements.

Registration Inspection

The buses must pass inspection at any LTA-Authorised Inspection Centres (see **Annex E**) before it can be registered.

Right-hand Drive

Only right-hand drive buses are allowed to be registered for use in Singapore.

Safety Belt

All new buses, except omnibuses, shall be fitted with retractable three-point seat belts at the driver seat and new small buses must have forward-facing seats fitted with retractable three-point seat belts. Small buses refer to buses with 9 seating capacity (excluding driver), and with MLW not exceeding 3,500kg. These buses can be registered as a School Bus, an Excursion Bus, a Private-Hire Bus or a Private Bus.

Safety Glass

All safety glass fitted onto the buses must meet one of the recognised international standards e.g. ECE, DOT, BS, JIS, etc. The safety glass must meet the following requirements:

- a) Not less than 70% for both the front windscreen and front side window glasses;
- b) Not less than 25% for rear windscreen and rear side window glasses for buses (i.e. private buses, private hire buses and excursion buses) that are not licensed to carry school children;
- c) Not less than 25% for rear windscreen for school bus and other buses (i.e. private buses, private hire buses and excursion buses) that are licensed to carry school children;
- d) Not less than 50% for rear side window glasses for school bus, omnibus and other buses (i.e. private buses, private hire buses and excursion buses) that are licensed to carry school children; and
- e) The glass of the front windscreen fitted to a motor vehicle shall not be made of a material or be of a design such as to prevent, obstruct or interfere with transmission of signals between an OBU installed in such vehicle and any Electronic Road Pricing (ERP) facility (see **Annex F**). Windscreens that contain metallic oxide coating or are designed with defroster are known to have caused such interference.

Device to observe blind spots for buses

With effect from 1 October 2015, all newly registered buses with MLW exceeding 8,000kg have to be fitted with mirrors/devices to enable the driver to have a clear view of the area within 300mm of the front and 300mm of the left side of the bus.

Chassis

- a) Every omnibus registered on or after 1 January 1990 shall be fitted with a chassis that is suitably designed and constructed for the carriage of passengers.
- b) Every private bus, excursion bus, private hire bus or school bus registered on or after 1 October 1996 shall be fitted with a chassis that is suitably designed and constructed for the carriage of passengers.

Rear Underrun Bumpers and Sideguards

Buses with MLW exceeding 3,500kg and buses with lower body exceeding 550mm above the ground must be fitted with approved rear underrun bumper and sideguards before they are allowed to be registered. Rear underrun bumper and sideguards are protective devices fitted at the back and sides of these vehicles. In the event of a collision between a smaller vehicle and a heavy vehicle, they will cushion the impact of collision and minimise injuries to drivers and passengers in the smaller vehicle.

The underrun bumper and sideguards must comply with the requirements as specified in the EEC Directives 79/490/EEC and 89/297/EEC respectively, or such, other standards as may be approved by LTA. The design drawings of such devices are required to be endorsed by a local professional engineer or vehicle manufacturer who has carried out simulation by calculation or laboratory testing.

Modifications to Vehicle

You are advised to consult the vehicle manufacturer and seek approval from LTA before carrying out any modification to the vehicle. Such modifications must be approved by the vehicle manufacturer. In addition, the modification work has to be carried out by either the vehicle manufacturer or an agent authorised by the vehicle manufacturer. The vehicle manufacturer or the authorised agent must certify that the modification is done according to the procedures and requirements set out by the vehicle manufacturer.

Asbestos-free Brake and Clutch

NEA requires all newly registered vehicles to have asbestos-free brake and clutch linings. This requirement is gazetted under the Poisons Act.

Chlorofluorocarbon (CFC)-free Air-conditioners

NEA requires the air-conditioners installed in all newly registered vehicles to use CFC-free refrigerant.

Use of Hydrocarbon (HC) Refrigerants in Vehicle Air-conditioning Systems

The use of HC refrigerants in vehicle air conditioning systems is not allowed. Refer to the Singapore Civil Defence Force's circular for more details:

<https://www.scdf.gov.sg/docs/default-source/scdf-library/scdf-circular-on-hydrocarbon-refrigerants-june-2015.pdf>

High Intensity Discharge (HID) Headlamps

Vehicles fitted with HID headlamps must be equipped with an auto-levelling feature.

Speedometer

All Buses must be able to permanently indicate/display vehicular speed in units of kilometres per hour (km/h).

Speed Limiter

All public service buses with MLW exceeding 10,000kg must be fitted with approved speed limiters with the set speed at 60km/h. The speed limiter must comply with European Standard 92/24/EEC or the British Standard BS AU 217: Part 1a: 1987.

Additional Requirements for School Buses

With effect from 4 January 2005, all School buses or any other buses licensed to convey school children to and from their school shall be fitted with a reflective “Children Crossing” sign with red blinking light emitting diodes (LEDs) at the rear of the bus. The Red blinking light will be activated whenever the entrance or exit door is open for the children to alight or board the bus.

The specifications are appended below:

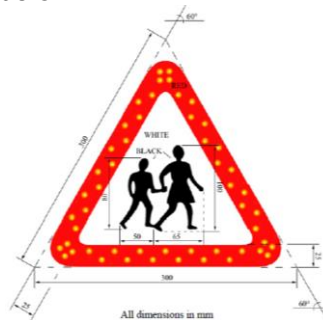


Figure 1: “Children Crossing” Sign

Specifications

- Dimension: Triangular in shape with a length of 300mm on each side as shown in the diagram. The dimension may be proportionately increased to a maximum of 1½ times the specified size.
- Casing: Body casing of plastic material.
- Surface: Retro-reflective material complying with ASTM Standards D4956 Type VII, Type VIII or Type IX (Specifications for retro-reflective sheeting for traffic control).
- Colour: White and red wide-angle prismatic retro-reflective material with black figures at the centre of the sign.
- LED: At least 50 units of ultra-bright red LEDs. The LEDs are arranged in two rows per side at the red retro-reflective materials and shall not be obstructed by the retro-reflective materials.
- Intensity: LEDs shall have a luminous intensity of at least 2500 milli-candela.
- Flashing rate: LEDs shall be lighted when the entrance or exit door is opened. The inner and outer rows of LEDs shall flash alternately at the rate of not less than 60 flashes per minute or not more than 120 flashes per minute.
- Location: Rear facing and securely affixed at the lower right-hand (off-side) corner of the rear window inside the vehicle.

Electric Vehicles and Electric Vehicle Charging Systems

All electric vehicles (EVs) must comply with recognised international vehicle safety standards such as those adopted by the EU countries, Japan and the USA. To show proof that the EVs are tested in accordance to the UN ECE Regulation No. 100, you will be required to produce the relevant certifications on electrical safety for electric powertrain vehicles issued by an overseas designated technical service (e.g. TUV, IDIADA, DEKRA, VCA etc.).

A nationwide EV charging standard TR25:2022 (Technical Reference for Electric Vehicle Charging System) has been established for the EV charging system in Singapore. Singapore has adopted Type 2 AC and Combo-2 DC charging systems as the nationwide public charging standard for EVs. CHAdeMO charging system is only allowed as an optional² public charging standard. To ensure safe use of the public charging infrastructure, an EV must be equipped with:

- a) A matching Type 2 vehicle inlet (or AC charging only); or
- b) A Combo-2 vehicle inlet (for AC and DC charging); or
- c) A matching Type 2 vehicle inlet (for AC charging) and a CHAdeMO vehicle inlet (for DC charging).

All EV chargers must be type-approved and affixed with approval labels before they can be supplied, installed or certified as fit for charging EVs. For more information on the type approval of EV chargers, please refer to the following link:

<https://onemotoring.lta.gov.sg/content/onemotoring/home/owning/electric-vehicle-charging/ev-charger-type-approval.html>

Please refer to **Annex G** for more information that is required for the importation of EVs.

² CHAdeMO is only allowed as an optional public charging standard and not as a national public charging standard. CHAdeMO chargers that comply with TR25:2022 can be imported and installed in Singapore, as long as they are provided alongside Type 2 AC and/or Combo 2 DC charging points.

List of LTA/NEA-Recognised Vehicle Exhaust Emission and Noise Emission Testing Laboratories for Buses

For Buses with MLW not exceeding 3,500kg:

Singapore

VICOM Emission Test Laboratory
[Only for exhaust emission test]
511 Bukit Batok Street 23, Singapore 659545

China

Tianjin Automotive Test Centre

1. Boxing Road, Beijing Economic and Technological Development Zone, Beijing, China
2. Room 526, Main Building, No.68, Xianfeng East Road, Dongli District, Tianjin, China/300300
3. No. 58, Gangpu Road, Meishan Free Trade Port Zone, Ningbo, Zhejiang, China/315832
4. Yancheng Automotive Proving Ground, Dafeng Economic Development Zone, Dafeng District, Yancheng, Jiangsu, China/224100

Hong Kong

Hong Kong Exhaust Emissions Laboratory Ltd
No. 140-A, Kat Hing Wai, Kam Tin, Yuen Long, New Territories, Hong Kong

For Buses with MLW exceeding 3,500kg:

Netherlands

RDW Centre for Vehicle Technology and Information
Zoetermeer Head-Office
Europaweg 205
PO Box 777
2700 AT Zoetermeer, The Netherlands

United Kingdom

Vehicle Certification Agency (VCA)
VCA Bristol
1, The Eastgate Office Centre
Eastgate Road, Bristol
BS5 6XX, United Kingdom

For all Buses:Japan

The following Japanese Emission Test Laboratories are ONLY accepted to perform WLTP-Japan under JPN2018 emission standard. Test reports for CO₂ and fuel consumption measurements have to be obtained from tests conducted in accordance with Regulation (EU) 2017/1151 or WLTP-Japan [TRIAS 08-002-02].

1. Japan Automobile Transport Technology Association
3-2-5 Yotsuya, Shinjuku-ku, Tokyo, Japan
2. Japan Vehicle Inspection Association
Toyoshima 7-26-28, Kita-Ku, Tokyo, Japan
3. Japan Automobile Research Institute
Shibadaimon 1-1-30, Minato-ku, Tokyo, Japan
4. Tokyo Metropolitan Research Institute for Environmental Protection
[Only for exhaust emission test]
Shinsuna 1-7-5, Koto-ku, Tokyo, Japan

The following Japanese Emission Test Laboratory is ONLY accepted to perform the Japan World Harmonised Vehicle Cycle (J-WHVC) tests for buses with MLW exceeding 3,500kg.

Japan Automobile Research Institute (JARI)
Shibadaimon 1-1-30, Minato-ku, Tokyo, Japan

India

The Automotive Research Association of India (ARAI)
Survey No. 102, Vetal Hill, Off Paud Road, Kothrud,
Pune, Maharashtra, India

France

Laboratoire De L'union Technique De L' Automobile
Du Motorcycle Et Du Cycle Autodrome De
91 Linas Monthlery, France

Germany

TÜV NORD Mobilität GmbH & Co. KG IFM – Institut für Fahrzeugtechnik und Mobilität
Adlerstraße 7; 45307 Essen

United Kingdom

1. Millbrook Proving Ground Ltd
Millbrook, Near Ampthill, Bedford MK45 2JQ, England
2. Horiba Mira Ltd
Watling Street, Nuneaton, Warwickshire CV10 0TU

Annex C
Page 1 of 2

The Registrar of Vehicles
Republic of Singapore

Certificate of Compliance
For Bus (MLW not exceeding 3,500kg)

For the purposes of rule 35 and rule 37 of the Road Traffic (Motor Vehicles, Construction and Use) Rules, the following certificate is submitted:

1. _____ was tested by the
(vehicle make/model)

(name and address of testing laboratory)

to ensure it complies with _____ and the
(exhaust emission and noise emission standards)
following were the results of the test:

Model : _____
Weight : _____
Engine No. : _____
Chassis No. : _____
Engine Capacity : _____

Test Type I (For Petrol – Positive ignition (PI))

Pollutants	CO mg/km	THC mg/km	NHMC mg/km	NOx mg/km	PM mg/km	PN #/km
Measured Values						
DF -Mult/Add*						
Final Values						
Limit Values						

Or

Test Type I (For Diesel – Compression ignition (CI))

Pollutants	CO mg/km	NOx mg/km	HC + NOx mg/km	PM mg/km	PN #/km
Measured Values					
DF -Mult/Add*					
Final Values					
Limit Values					

Sound Level Test Results:

Measured according to: <<State Regulations/Directives>>

Stationary: _____ dB(A) at engine speed: _____ min⁻¹

Drive-by / L_{urban}: _____ dB(A)

Annex C
Page 2 of 2

2. The particulars set out in paragraph 1 are true and correct.
Based on the said particulars, the *manufacturer / testing laboratory hereby declares that
_____ complies with the above mentioned
(vehicle make/model)
exhaust emission and noise emission standards.

Dated this _____ day of _____ 20_____.

For and on behalf of the
Manufacturer:

(1) _____
(Signature of Chief Executive of Company)

(Name)

(2) _____
(Signature of Engineer)

(Name)

(Qualifications)

* Delete where not applicable

Sound Level Test Results:

Measured according to: <<State Regulations/Directives>>

Stationary: _____ dB(A) at engine speed: _____ min⁻¹

Drive-by / L_{urban}: _____ dB(A)

2. The particulars set out in paragraph 1 are true and correct.

Based on the said particulars, the *manufacturer / testing laboratory hereby declares that _____ complies with the above mentioned

(vehicle make/model)

exhaust emission and noise emission standards.

Dated this _____ day of _____ 20_____.

For and on behalf of the
Manufacturer:

(1) _____
(Signature of Chief Executive of Company)

(Name)

(2) _____
(Signature of Engineer)

(Name)

(Qualifications)

* Delete where not applicable

Annex E

List of LTA-Authorised Inspection Centres

JIC Inspection Services Pte Ltd (Pioneer)
53 Pioneer Road
Singapore 628505
Tel: 6863 9639

STA Inspection Pte Ltd (Boon Lay)
249 Jalan Boon Lay
Singapore 619523
Tel: 6261 6178

STA Inspection Pte Ltd (Sin Ming)
302 Sin Ming Road
Singapore 575627
Tel: 6452 1398

VICOM Inspection Centre Ltd (Bukit Batok)
511 Bukit Batok Street 23
Singapore 659545
Tel: 6567 7111

VICOM Inspection Centre Ltd (Changi)
20 Changi North Crescent
Singapore 499613
Tel: 6545 4808

VICOM Inspection Centre Ltd (Kaki Bukit)
23 Kaki Bukit Avenue 4
Singapore 415933
Tel: 6749 5422

VICOM Inspection Centre Ltd (Sin Ming)
385 Sin Ming Drive
Singapore 575718
Tel: 6458 4555

VICOM Inspection Centre Ltd (Yishun)
501 Yishun Industrial Park A
Singapore 768732
Tel: 6755 9028

On-Board Unit (OBU) Installation Requirements

1) Placement of the OBU Components for Buses

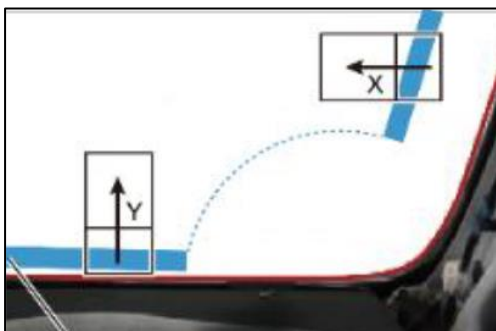
All buses to be registered in Singapore will be fitted with a three-piece OBU, comprising an Antenna, Processing Unit and an optional Touchscreen Display. During installation, the workshop* will assess the make and model of the bus and check with the vehicle owner on aspects such as placement of the Processing Unit and the optional installation of the Touchscreen Display, including its preferred position.

*Do note that only LTA-Authorised persons (e.g. authorised workshop technicians) are able to install the OBU in motor vehicles. Self-installation of the OBU is not permitted, and doing so is an offence under the Road Traffic Act (Electronic Road Pricing System) Rules 2015.

2) Placement of the OBU Antenna

For the OBU Antenna, the position with respect to the windscreen edges and the associated fitting base are determined by the angle of the windscreen from the vertical line, as specified below:

Windscreen Angle (from Horizontal Line)	Antenna Unit Fitting Base	Minimum Distance from Vehicle's Black Ceramic Border Line	
		Horizontally (<i>X dimension</i>)	Vertically (<i>Y dimension</i>)
<45°	Not required	10 cm	5 cm
45° to 65°	20° Fitting Base	15 cm	15 cm
>65°	40° Fitting Base	15 cm	15 cm



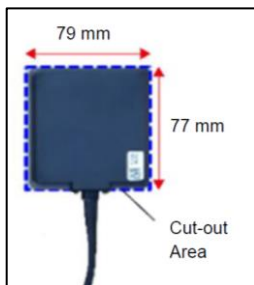
Annex F

Page 2 of 5

In addition, the OBU Antenna should not be installed at locations that could potentially interfere with the transmission of signals between the OBU Antenna installed in such vehicle and any Electronic Road Pricing facility.

Locations known to have caused such interference are:

- i) Any type of solar film that affects or interferes with radio frequencies.
- ii) Windscreens that contain metallic oxide coating or are designed with defroster. A cut-out area of minimally 77 mm by 79 mm will be required.



- iii) A location on or near metal surfaces and/or electronic devices (e.g. dash cam) that will affect performance of antenna.
- iv) A location that will be blocked or hindered by wiper's stationary position. In which case, the OBU Antenna needs to be placed above and away from the wiper's stopping position.

3) Technical Requirements for OBU Installation in Buses

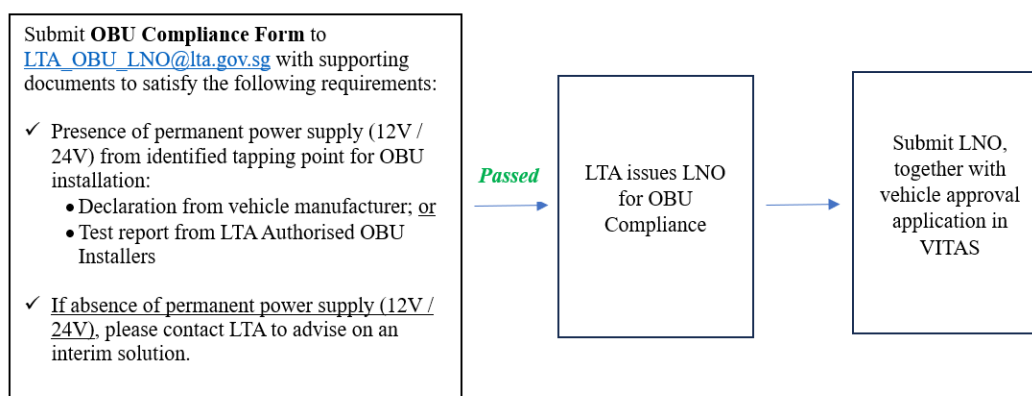
Category	Requirements
+B Permanent Power (OBU Yellow Cable)	OBU requires a permanent power source: <ul style="list-style-type: none"> • Minimum of DC 12V • Maximum of DC 36V This permanent power source shall be available <u>regardless of vehicle engine on/off</u> and even during the charging of the vehicle's battery.
Ignition Detection Line (OBU Red Cable)	Must exceed DC 4.16V when vehicle ignition is on and must not exceed DC 4.16V when vehicle ignition is off, even if certain accessories remain active.
Ground (OBU Black Cable)	Use of vehicle battery or vehicle chassis ground
Battery Capacity	Vehicle battery capacity shall meet minimum : 34Ah @12V
Current Rating	Vehicle's battery must support the following OBU current rating: Typical : 0.6-0.8A @12V Maximum (high load situation): 1.2A @12V

4) Letter of No Objection (LNO)

Any motor dealer, distributor or importer who wants to register buses with LTA in Singapore must submit the OBU Compliance Form together with the relevant declaration and/or test report to LTA (via email to LTA_OBU_LNO@lta.gov.sg). A LNO will be issued by LTA if the submitted documents and information are in order. You are required to submit the LNO as part of your vehicle approval application for new registration of buses in the Vehicle Inspection and Type Approval System (VITAS).

If the relevant buses do not present a permanent 12V power supply that can be used for OBU installation, LTA will contact the applicant on an interim solutioning.

An overview of the procedure for obtaining the LNO is shown in the diagram below.



5) OBU Compliance Form for Non-Motorcycles/Scooters

OBU Compliance Form for Non-Motorcycles/Scooters	
Notes for Application:	
1) For Batch Vehicles Approval , only one OBU Letter of No Objection (LNO) is needed per each batch approval application (limited to 50 quantities per application).	
2) For Extension to Type Approval , a new OBU LNO is required only if the vehicle's internal circuitry is changed, which results in different permanent power and ignition source points.	
Application Date	DD/MM/YYYY
Company Name	Applicant Company Name "SAMPLE XYZ Pte Ltd"
UEN	<i>Applicant to provide UEN</i>
Local Registered Office Address	<i>Applicant to provide Singapore Registered Office Address</i>
Contact Person Name / Phone No. / Email Address	<i>Applicant to provide contact details</i>
Vehicle Brand	<i>Applicant to provide brand of vehicle</i>
Vehicle Type	<i>Applicant to provide type of vehicle and if ICE or Hybrid or Electric</i>
Vehicle Models	<i>Applicant to provide model/s of vehicle</i>
Battery Capacity	xx Ah
Permanent Power 12V/24V source available for OBU installation	Yes/No
Indicate with illustrations of actual vehicle (e.g. pictures, schematics, datasheet) on where power sources are tapped	Please indicate the following electrical points clearly: i. Permanent 12V/24V – ii. Ignition Source –
Does the vehicle come with an original factory fitted power disconnect switch?	Yes/No

6) Format of Declaration / Test Report

Template for Declaration / Test Report Vehicles (Non-Motorcycles/Scooters)			
Permanent Power Source (Indicate electrical point: _____)			
No.	Test Description	Expected Result	Actual Result (Provide pictures)
1	Test electrical point for permanent power using multimeter when vehicle in Ignition OFF / Sleep state	Minimum 12V / 24V present at electrical point	
2	Test same electrical point 30 mins later, for permanent power using multimeter when vehicle in Ignition OFF / Sleep state (Dependent on vehicle design please adjust to the correct waiting time if the vehicle takes more than 30 mins to be in sleep state)	Continue to have minimum 12V / 24V present at electrical point	
Ignition / State Source (Indicate electrical point: _____)			
No.	Test Description	Expected Result	Actual Result (Provide pictures)
1	Test electrical point for Ignition / state using multimeter when vehicle in Ignition ON / Active state	Voltage measure within 12V / 24V	
2	Test electrical point for Ignition / state using multimeter when vehicle in Ignition OFF / Sleep state	Voltage measure 0V	

Company Name:	
Name of Tester:	
NRIC/FIN (Last 4 digit):	
Email:	
Contact Number:	

Information required for Electric Vehicles (EVs)

- a) Establishment and background of the vehicle manufacturer.
- b) The EV production volume per year, number of EVs exported and countries exported to.
- c) Appropriate document issued by an approving authority to show the international recognition of the vehicle manufacturer [e.g. World Manufacturer Identifier (WMI) code allotted by Society of Automotive Engineers (SAE)].
- d) Appropriate document issued by the certifying authorities in the approving country and other countries, if available, to show the acceptance of the vehicle.
- e) A list of EV components and the relevant standards which the EV components had complied with (to be provided by the vehicle manufacturer) together with compliant test reports.
- f) Certification and test reports issued by an overseas designated technical service (e.g. TUV, IDIADA, DEKRA, VCA etc.) showing that EVs comply with the requirements in UN ECE Regulation No. 100 – for the electric power train of EVs.
- g) LTA registration mark of registered EV Chargers, as proof that the EV charging system are registered with LTA. For more information, please refer to the following website:
<https://onemotoring.lta.gov.sg/content/onemotoring/home/owning/electric-vehicle-charging.html>

Copy of the Technical Reference is available at:

Toppan Leefung Pte Ltd

1 Kim Seng Promenade

#18-01 Great World City East Tower

Singapore 237994

Phone / Fax: (65) 6826 9691 / (65) 6820 3341

Website: <https://www.singaporestandardseshop.sg/>

Email: singaporestandardseshop@toppanleefung.com

- h) The type of tests which the vehicle had undergone.
- i) The safety features (both mechanical and electrical) of the vehicle, e.g. electrical isolation to prevent electrical shock hazard.
- j) List of vehicle manufacturer facilities and equipment (with photographs).
- k) A copy of the facility appraisal certificate issued by the certifying authority who conducts routine checks on vehicle manufacturer's facilities and equipment.

Annex G
Page 2 of 2

- l) Detailed technical specifications of the vehicles which are to be imported into Singapore.
- m) Vehicles to meet all On-Board Unit (OBU) Installation Requirements as listed in **Annex F**.

Note:

- For new agency, documentary proof from vehicle manufacturer must be produced showing the authorisation of the company as the sole agent of the vehicle in Singapore.
 - All the above information must be provided by the vehicle manufacturer.
-

Printing date: 1 April 2025

The information contained in this handout is current at the time of printing.
It is subject to change as may be required by the LTA or other relevant authorities.