

Application Form for the Deployment of Autonomous Vehicles (AVs) on Public Paths

INTRODUCTION

Currently, the Active Mobility Act 2017 (“**AMA**”) prohibits the deployment of **AVs of any types** on public paths¹. To ensure the safety of other path users and given the nascency of such technology, the Land Transport Authority of Singapore (the “**LTA**”), in collaboration with the Centre of Excellence for Testing & Research of Autonomous Vehicles – NTU (“**CETRAN**”), has developed a testing framework for AVs on Public Paths (“**T1**”), to evaluate the safe use of these AVs before they can be trialled on public paths. AVs must pass this test before exemptions for their use on public paths can be considered.

PROCESS TO APPLY FOR AN EXEMPTION

1. If you intend to request for an exemption to deploy your AVs on public paths, please complete this application form (including **Part A and Part B**) and send it to AM_requests@lta.gov.sg.
2. If there are no further clarifications required from LTA, CETRAN AV Test Centre will contact you with further clarifications and specify a test date.
3. An exemption request will be put up to Minister for Transport only if it is assessed that your AVs have passed T1.

We would like to share that the whole process, including obtaining a test slot and processing the exemption request, will take approximately **12 weeks**. Please cater for sufficient time prior to your intended deployment date. LTA will not be obliged to assess any LATE and/or INCOMPLETE submission of exemption request.

* Please note that any proposed use of the AVs on public paths, including pre-tests/mapping of the routes, prior to the actual deployment or commencement of the trial will also require the exemption from the AMA. Please do indicate the dates of such pre-test/mapping in Part A.

KEY THINGS TO NOTE (AFTER EXEMPTIONS HAVE BEEN APPROVED)

1. It is mandatory for a safety operator² to supervise the AVs during the relevant trial (the “**Trial**”) at all times in close proximity to the AVs. For AVs carrying passengers, a safety operator must be on board.
2. The maximum speed of AVs not carrying passengers will be capped at 5km/h during the Trial after passing T1. For AVs carrying passengers and with a safety driver on board, it will be capped at 10km/h.

¹ Under the AMA, an AV designed to move and operate independently of human control when the computer that controls it is programmed, would fall within the definition of a “motor vehicle”. They are not permitted on public paths that have been declared under section 6 of the AMA.

² When the AV is moving, the safety operator should be monitoring the movement of the AV and its surroundings and should not be multi-tasking in any activity that is not relevant to the operations of the AVs.

3. Further conditions may be imposed on the AV or the Trial upon completion of the T1 AV assessment.

TERMS AND CONDITIONS

- 1) We, _____ (*please state name of organisation/name of company as registered under ACRA, UEN No.*), wish to apply for exemptions to the Active Mobility Act 2017, the Road Traffic (Autonomous Motor Vehicles) Rules 2017 and the Road Traffic Act (Cap. 276) (as applicable) (collectively, the “**Exemptions**”), and agree to undergo the P1 and/or T1 Test (where applicable) (collectively, the “**Tests**”), for the proposed deployment of Autonomous Vehicles on public paths.
- 2) In the event that the Exemptions are granted, we shall fully indemnify LTA and any other relevant authority against all liabilities, injuries, claims, demands, writs, summonses, actions, suits, proceedings, judgments, orders, decrees, interferences, disruptions, penalties, fines, losses, damages, costs (including legal costs on a full indemnity basis and experts’ and consultants’ fees), settlement sums and sums paid in satisfaction of court, arbitral or expert award and expenses of any nature whatsoever regardless of the cause of action (collectively, “**Liabilities**”), that may arise under, in relation to or in connection with the Tests or the Trial to be conducted within the approved geographical boundaries as specified in the Exemptions.
- 3) In the event that the Exemptions are granted, we shall not hold LTA and/or any other relevant authority liable for any Liabilities that may arise under, or in relation to or in connection with the Trials to be conducted at the approved geographical boundaries specified in the Exemptions.
- 5) We acknowledge and accept that the Trial will be regulated by the relevant legislation including the Road Traffic (Autonomous Motor Vehicles) Rules 2017, and that any Exemptions granted shall be subject to the conditions of the Exemptions. In addition, we shall comply strictly with any other terms and conditions (including any amendments to such terms and conditions issued from time to time) that may be imposed by LTA and/or any other relevant authority in connection with the Trial.
- 6) We understand that LTA and/or its partners and/or agents may, from time to time, disclose information to us in connection with the Tests and the Trial, including documents and information relating to vehicle assessments and test requirements, which is being designated, labelled or marked as confidential or its equivalent (collectively the “**Confidential Information**”). We declare and undertake that without LTA’s prior written approval, we shall (a) only use the Confidential Information for the purpose of or in connection with the Tests or the Trial (the “**Purpose**”); and (b) not disclose any Confidential Information to any person or entity other than such of our employees, agents, contractors or collaboration partners having a "need to know" in order to carry out the Purpose and who are bound by confidentiality obligations identical to that set out in this Clause 6 and Clause 7 below.

7) We consent to the collection, use and disclosure of our Personal Data³ as disclosed in this application, by CETRAN and the LTA for the purposes of processing my application.

8) We agree that our obligation to keep confidential the Confidential Information in Clause 6 above shall survive without limit in time, notwithstanding the expiry of the Exemptions. We acknowledge that a breach of this confidentiality obligation may render us liable for an offence under section 5(1)(d) of the Official Secrets Act (Cap. 213) (“**OSA**”), which carries a penalty, on conviction, of a fine not exceeding \$2,000 and to imprisonment for a term not exceeding 2 years, and in the case where the Public Prosecutor consents to the person being tried before the Magistrate’s Court, to a fine not exceeding \$1,000 and to imprisonment for a term not exceeding 6 months” (section 17(2) of the OSA).

9) We declare and undertake that the information provided in this application, and in all supporting documents appended herewith, including the signed Undertaking to Safeguard Official Information (“**Letter AV04**”) is true and complete to the best of our knowledge. We acknowledge that if we have suppressed any material information or provided false or inaccurate information, our application may be rejected.

10) We declare that we have read and understood the above and unconditionally agree and accept to be legally bound by and comply with the above Terms and Conditions. We acknowledge that the failure to comply with the Terms and Conditions of this application may cause irreparable damage to LTA for which monetary damages are not a sufficient remedy, and LTA shall be entitled to seek injunctive relief to prohibit any breach or threatened breach of any of these Terms and Conditions.

<u>Name¹, NRIC(last 4 digits)/Passport No. & Designation</u>	<u>Date</u>	<u>Signature¹</u>

¹ If the applicant is a non-individual, the name, NRIC/Passport No. and signatory of the authorised person from the company is needed.

³“Personal Data” means data, whether true or not, about an individual who can be identified (a) from that data; or (b) from that data and other information to which CETRAN or the LTA has or is likely to have access.

UNDERTAKING TO SAFEGUARD OFFICIAL INFORMATION

1. My attention has been drawn to the *Official Secrets Act* (Cap. 213) and in particular to Section 5 thereof which relates to the safeguarding of official information.
2. I understand and agree that all official information disclosed to me for the purpose of or in connection with the Tests or the Trial, including documents relating to vehicle assessments and test requirements, which is being designated, labelled or marked as confidential or its equivalent, is of a strictly secret and confidential nature, and is not to be published or communicated by me to any other person in any form whatsoever except to my employees, agents, contractors or collaboration partners who need to know the information for the same specific purposes.
3. Subject to Clause 2 above, I shall ensure that any employee, agent or contractor who is authorised by me to have access to any official information shall similarly sign an undertaking to safeguard official information.
4. I undertake to return any document received from the Land Transport Authority of Singapore or the Government of Singapore, and any other copies made or reproduced from such document or part thereof whenever required by the Land Transport Authority of Singapore or the Government.
5. I further understand and agree that any breach or neglect of this undertaking may render me liable to prosecution under the *Official Secrets Act*.

Signature_____
Full Name in BLOCKS_____
NRIC/Passport No_____
Designation_____
Name of Company_____
Date_____
Signature of Witness_____
Full Name in BLOCKS_____
NRIC No

Address: _____

Date: _____

PART A

Note: Please fill in all data blanks and check all boxes. For data blanks that are not applicable, please indicate “N/A”.

Application Details

Please provide details of the request:

1. Company/Organisation

Item	Detail
Company/Organisation	Name and UEN (where applicable for companies)
Contact person	Name of contact person
Contact designation	Designation of contact person
Contact email	Email address of contact person
Contact phone number	Phone number (mobile preferred) of contact person
Ministry or Statutory Board supporting the request (if any) Please also provide contact person from the Ministry / Statutory board here	

2. Device design specifications

Item	Detail
Device make and model	Vehicle make and model
Device VIN or unique identification (if any)	VIN number or unique identification
Device description	Description including special modifications and comments (optional)
Dimensions in cm (W x L x H)	
Unladen weight (kg)	
Maximum weight with Payload (kg)	
Maximum design speed (km/h)	
Certificates in relation to conformity of the device (if none, indicate NIL)	
Certification for batteries or installed power packs e.g. UL2271, UN38.3 or other equivalent certifications for proof of safety for use (if none, indicate NIL)	

Photographs of the device (views from front, rear and the two sides of the devices)	Please attach here or separately as part of the supporting documents
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3. Details of AV Trials

Item	Detail
Objective of intended trial	Please elaborate the purpose of the deployment. If it is to facilitate COVID-19 operations, please do elaborate too
Intended period and timing of intended trial	Please indicate the dates and times
Intended place and route of intended trial	Please attach a clear map (either here or as a separate attachment the route that you intend for the AV to take, marking in different colours, the (1) footpaths, (2) cycling / shared paths, as part of the supporting documents, (3) Pedestrian/informal crossings (if applicable)
Operating speed of AV during intended trial (km/h)	
Type of payload and maximum weight of payload, if any (kg)	Please elaborate on the payload that the AVs would be carrying during its intended trial
Maximum weight of AV (i.e. empty weight + maximum payload) during intended trial (kg)	
Description of previous trials, if any (In Singapore or overseas) You may attach supporting documents of these trials as part of the application.	
Will the device be carrying passengers?	
Is your company already a registered user with access to CETRAN AV Test Centre for your own testing?	Yes / No

4. Insurance Coverage

Insurance coverage against third-party injury and death as well as property damage will be imposed as part of the conditions for the exemption of the AVs on public paths. Please

indicate if you will be procuring insurance coverage for the deployment of the AVs on public paths.

- Yes. We have procured / will be procuring insurance coverage against **third party property damage** and **third-party injury and death** only.
- No, we have issues/problems procuring the required insurance.

5. Safety Measures in place during the Trial

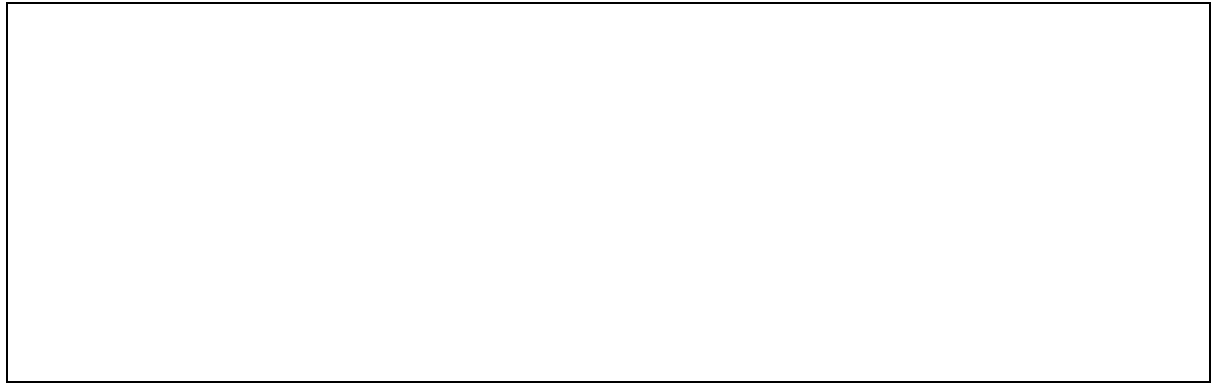
- a) Indicate if the AV is equipped with an audible alert / bell or other visible signs (such as a flag), or both to alert other users of its presence. Please elaborate with pictures if possible.

- b) Indicate if a seatbelt is available for seated passengers (This applies for AVs carrying passengers only): (Y/N)

- c) Details of first-aid / emergency plans (e.g. is operator first-aid trained, SOP if there is an injury involving the AV):

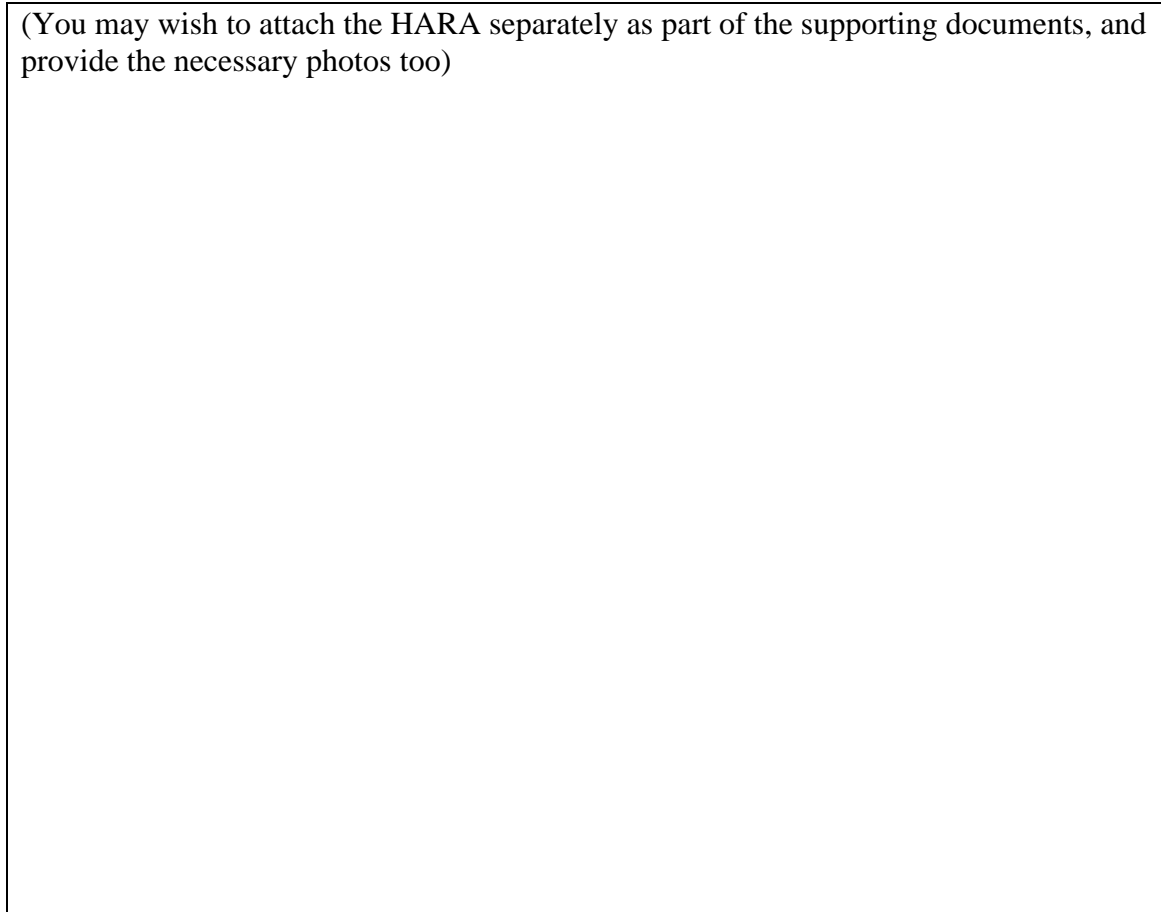
- d) Provide details of measures used to ensure pedestrians and other path users are aware of its presence.

- e) Indicate if the route for the AV will be closed off to the public (e.g. pedestrians or active mobility device users etc.), or if there will be physical segregation of path users from the AV on the paths:



- f) Provide a Hazard Analysis and Risk Assessment (“**HARA**”)⁴ showing an assessment of potential risks and hazards expected to be encountered at the trial site and proposed safety measures to mitigate such risks or hazards.

(You may wish to attach the HARA separately as part of the supporting documents, and provide the necessary photos too)



⁴ Note that the HARA should have been endorsed/approved internally by the relevant approving authority in your company. LTA is not endorsing/approving the HARA by means of your submission.

Part B

1. Application process

1.1 Overview

This form is an application for Autonomous Vehicles (“AVs”) for use on Public Paths Testing (“T1”). AVs are required to pass the T1 assessment before the Land Transport Authority of Singapore (“LTA”) will support a request for an exemption by the Minister for Transport from provisions of the Active Mobility Act 2017, Road Traffic (Autonomous Motor Vehicles) Rules 2017 and Road Traffic Act (Cap. 276) (as applicable) for devices to be operated autonomously on public paths within a designated area.

The requirements for T1 assessment can be found in the document *T1-REQ-AVPP-01*.

1.2 Process for T1 assessment

Please refer to below for the process of booking a T1 assessment:

- i.* Applicants that seek exemptions from the relevant legislation are to apply to LTA, and requests that are supported by LTA will be raised to the Minister for Transport for consideration. Upon receipt of a confirmation from the LTA that the application is at a status where a T1 outcome would be required for further assessment, the Applicant is to request for a T1 assessment from CETRAN via the following email address: cetran@ntu.edu.sg. Applicants are to submit this completed application form together with the necessary documents (refer to section 1.3). Any clarifications that you wish to seek should be raised during this phase.
- ii.* CETRAN will get back to applicants within 7 working days on the eligibility of the AV for T1 assessment. If the AV is eligible to take the T1 assessment based on technical specifications, CETRAN will suggest possible test dates.

1.3 Documents to be submitted

The following documents have to be submitted to and reviewed by CETRAN before the scheduling of the T1 assessment. Incomplete submissions will result in a delayed scheduling of the assessment.

- i.* Completed Application Form
- ii.* Standard Operating Procedure
- iii.* Overview of the Safety Operator Training Programme
- iv.* Photographs of the AV that show the AV’s exterior, key features and safety operator controls (approx. 4-10 photos)

2. Application details

All basic AV specific information will be taken from the submission of Form A by the applicant. Form A will be passed by the LTA to CETRAN for the purpose of conducting the T1 assessment.

2.1 Safety Operator(s)

Name	Operator's date of birth	Singapore driver's license or ID last 5 digits (only applicable for Cat C AVs only)
Operator Name 1	DD/MM/YY	Operator 1 Driver license in form xxxxx123A
Operator Name 2	DD/MM/YY	Operator 2 Driver license in form xxxxx123A
Operator Name 3	DD/MM/YY	Operator 3 Driver license in form xxxxx123A

The applicant also warrants that express consent has been obtained from the above operator(s) for the applicant to submit personal data belonging to such person(s) to LTA for the purpose of validating the identity of the safety operator(s).

For additional safety operators, please include the particulars of the safety operators in the same format as stated above, as an appendix attached to the application form.

3. T1 Requirements for AV on Public Paths

3.1 Minimum basic requirement

Section 3 must be completed in full. This will be used to assess whether the AV on Public Paths is eligible for a T1 assessment and if special considerations need to be in place for the assessment.

3.2 Path keeping and turning

Test components	Assessed in T1	Remarks
Keeping left on paths	Yes	Comment if requirement cannot be met
Path discipline (ability to keep to a programmed path and limit swerving)	Yes	Comment if requirement cannot be met
Speed Limits (5km/h for Cat A1/A2, 10km/h for Cat B1/B2)	Yes	Comment if requirement cannot be met
Turning right and turning left	Yes	Comment if requirement cannot be met

3.3 Interaction with other path users

Item	Assessed in T1	Remarks
Stopping distances when encountering obstacles	Yes	Comment if requirement cannot be met
Safety of pedestrians	Yes	Comment if requirement cannot be met
Safe driving on the path	Yes	Comment if requirement cannot be met

3.4 Further T1 Requirements for AV on Public Paths

Requirement description	Assessed in T1	Remarks
The AV has a means by which the safety operator can immediately take over control from autonomous mode and enter operator-controlled mode	Yes	Comment if requirement cannot be met
The AV has at least 2 mechanisms to stop the AV, both of which are easily accessible to the safety operator: one primary control means (e.g. remote control) and one physical E-stop button on the AV	Yes	Comment if requirement cannot be met
The AV must be able to safely deal with both static and dynamic obstacles which come into its path (e.g. stopping or performing obstacle avoidance)	Yes	Comment if requirement cannot be met

The AV will not roll unintentionally in any direction, including on sloped ground	Yes	Comment if requirement cannot be met
In the event that the AV loses connection to the remote control, the safety operator must be notified immediately and must be able to regain control of the AV when required or the AV must stop	Yes	Comment if requirement cannot be met
The AV has an automated system (e.g. audio, visual or any other suitable forms of indication) to alert the safety operator to take control of the AV if a technology failure* is detected. <i>*Technological failure is defined by any failure which requires the safety operator to take control of the vehicle and could include hardware failure (loose connections, etc.), software failure, etc.</i>	Yes	Comment if requirement cannot be met
The AV is constructed such that it is mechanically and electrically safe for operation on its planned route and during any interactions with path users / operators / service users	Yes	Comment if requirement cannot be met
The safety operator must have knowledge of the operating mode of the AV at all times (e.g. through a light indicator on the AV or on the remote control etc.)	Yes	Comment if requirement cannot be met
Any remote control must be reasonably secured onto the safety operator (e.g. via a lanyard etc.) and should not compromise safety due to entanglement	Yes	Comment if requirement cannot be met
AV must have front white and rear red lights to sufficiently inform path users during hours of darkness	Yes	Comment if requirement cannot be met
The AVs of height less than 75cm should have a flag or visibility device at 75cm or higher from path level to provide sufficient visibility to path users	Yes	Comment if requirement cannot be met
The AV has a unique ID number (the number to be ascribed by the developer) clearly labelled on the AV	Yes	Comment if requirement cannot be met

The AV has sufficient decal/stickers to denote to the other path users that it is an AV operating on Public Paths	Yes	Comment if requirement cannot be met
The AV has an external-facing front and rear facing camera. For AVs with on board safety operator, there must also be an internal facing camera (capturing safety operator, controls and external view)	Yes	Comment if requirement cannot be met
There must be a system to capture and store the autonomous technology sensor data. For example, it could be an event data recorder or black box	Yes	Comment if requirement cannot be met

Assessment preparation

Questions	Response
Please state all the method(s) of manual takeover by the safety operator as per SOP	
Please state all the method(s) of emergency stop by the safety operator as per SOP	
What is the intended speed of the AV during testing? (The operating speed during the test should be representative of the intended deployment speed)	
(For Cat B2 only) Is there a passenger seat in the AV that is available to be occupied during testing?	
What is the proposed method for demonstrating the capability to detect technology failures?	