[BUS RECOVERY EQUIPMENT]

1 INTRODUCTION

The Land Transport Authority (LTA) spearheads land transport developments in Singapore. We plan, design, build and maintain Singapore's land transport infrastructure and systems. We aspire to strengthen Singapore's land transport connectivity and integrate a greener and more inclusive public transport system complemented by walk and cycle options. We harness technology to strengthen our rail and bus infrastructure and develop exciting options for future land transport. These are encapsulated under our Land Transport Masterplan 2040 (LTMP2040).

As we work towards achieving our goals under LTMP2040, we are often confronted with operational challenges driven by a dynamic operating environment. At the same time, we continue to strive towards better cost effectiveness, manpower optimisation, environmental sustainability, reliability and safer operations. These then present us with opportunities to work closely and co-create solutions to address the challenges and requirements with our ecosystem partners / innovators. LTA has launched this call-for-solution for "Bus Recovery Equipment", and we invite interested partners / innovators to collaborate with us.

2 PROBLEM STATEMENT

As part of LTMP 2040, LTA has committed to electrify 50% of our public bus fleet by 2030. To support the deployment of electric buses (e-buses), the bus depots will progressively be installed with electric chargers. In line with land use intensification, our new bus depots are typically multi-storey, with maintenance facilities on the ground level and bus parking (for both diesel buses and e-buses) on the higher floors. Bus operations in Singapore require buses to return to depots for garaging, and at the same time, electric buses would be charged (via plug in chargers) at the parking lots.

Fire safety is an important aspect of our bus depot operations. Just as we continually review safety enhancements for our traditional diesel bus fleets, we are looking to do the same for e-buses. Specifically, one potential risk in the unlikely event of an e-bus fire is to avert the spread of fire within the depot to prevent greater damage and loss of bus infrastructure and assets. Moreover, even when the e-bus fire is extinguished, there remains a possibility of re-ignition, which could be a result from sparks created by parts of the burnt bus being in contact with the ground / depot structures during the removal process.

To mitigate such subsequent fires, an appropriate post-fire recovery equipment would enhance the safety of the existing extraction process to relocate a burnt e-bus from a multistorey bus depot into an isolated water containment structure. The water containment is located on the ground floor and away from the building structure. This would further enhance other existing fire mitigation measures (i.e. sprinklers to extinguish the fire and cool down the surrounding temperature, water curtains to prevent the spread to other group of buses).

Therefore, LTA wishes to collaborate and consolidate ideas with the interested partners / innovators to design, build and assemble a suitable equipment for e-buses (to accommodate the full length of a double deck bus), collectively known as the "Bus Recovery Equipment", to remove burnt e-buses out of the building premises efficiently and safely.

3 WHAT ARE WE LOOKING FOR?

The proposal / solution should cover the following key requirements:

1. Extract the entire burnt e-bus out of the multistorey bus depot into an isolated containment located outside the depot building; The single direction ramps, with a gradient of 1:20, have a width of about 7 metres. The driveways within the bus park levels have a width of about 15 metres. The extraction should be carried out at a maximum overall height of 4.9m (max overall height of buses are 4.5m) from the bus parking level.
2. Equipment should not allow any part of the bus to be in contact with the surface of the ground during the extraction, should be able to secure the burnt e-bus and extract it out of the bus depot quickly and safely.
3. Support the maximum unladen weight of a double-deck e-bus, which is about 17 tons.
4. Design should facilitate ease of deployment at different bus depots. These bus depots would be located at different parts of Singapore. The deployment of equipment to bus depots could be through other transport means (i.e. low bedder vehicles).
5. The eventual design of the equipment could be provided by Dec 2024 and operationalized by Mar 2025 to allow for implementation at the new bus depot.
6. Operations and Maintenance (O&M) manual for the Bus Recovery Equipment, which should include detailed instructions in operating the equipment, preventive and corrective maintenance, maintenance schedule, scope of works, etc.
7. Operating model / Solution Case model of the equipment. Proposals would be considered more favorably if tenderer has included solution for both equipment development and subsequent deployment.
8. Provide an estimated cost of implementation for the proposed solution, and its estimated recurring operations / maintenance costs. Itemised costing of known

components for both implementation and operations / maintenance is expected. As actual cost will subject to actual system configuration at point of implementation, appropriate assumptions to the cost estimation could be stated.

4 EVALUATION GUIDELINES

The evaluation of the proposal will be guided by, but not limited to, the evaluation criteria set out below:

1. Quality of the technical proposal in meeting the key requirements described in Section 3. The proposal should include, but not limited to:
   - Clear understanding of the operational requirements
   - Clear concepts and methodology in the solution
   - Reliability of solution with sufficient failsafe mechanisms to address potential risks.
2. Cost-effectiveness of the solution (e.g. cost of development, implementation, maintenance, customisation, and upscaling), based on estimated implementation and recurring costs provided.
3. Proper equipment care. With a possibility on its low usage, clear instructions on caretaking of the equipment should be provided (i.e. frequency of warming up required to prevent damage to parts etc.). Moreover, components of the equipment should be readily available.
4. Track record of company.

Participants whose proposals demonstrate the capabilities and abilities to meet or exceed the performance criteria may be invited by LTA to conduct further clarifications of the proposed solution with LTA.

5 TIMELINE

LTA will hold a briefing to provide more information on the problem statement on 10 May 2024, 2pm – 4pm, at the Land Transport Authority (LTA) – Hampshire Office (1 Hampshire Road, Singapore 219428), HSO Auditorium. Register your interest to attend a technical briefing via this submission form.

- The briefing will take place only if sufficient interest is received by 2 May 2024, 4pm.
- All registered attendees will receive a confirmation by 3 May 2024.

All proposals must be submitted by 29 May 2024, 4pm via this submission form.

We encourage interested parties to visit the Land Transport Innovation Portal for the latest updates.

6 GUIDELINES FOR PARTICIPATION

1. The purpose of this brief is to provide preliminary information on the problem statement on "Bus Recovery Equipment". Please note that the information provided does not form part of any subsequent contract.

2. To register for this Call for Solutions, you must be from one of the following:
    a. Private company, with local business registration;
    b. Tertiary institution based in and operating from Singapore;
    c. Research institution based in and operating from Singapore; or
    d. A consortium of any of the above.
3. If you will be registering as a consortium, do appoint a lead member as the main applicant and make all submissions through this lead member. The actions by the lead member of the team will be treated as representative of the consortium. All correspondence will be directed to the lead member.
4. Please provide relevant information on your (or consortium members') past experiences that are relevant for this submission.
5. Do note that all proposals submitted through this call should be sufficiently brief, but with sufficient details for LTA's preliminary evaluation and shortlisting only. If your solution is shortlisted after the close of this call, we will contact you for further clarifications. You may be asked to make presentations and/or provide more information on your solution to LTA and/or requested to host LTA at any proposed venue and/or facilities for visits and better understanding of the proposed solution.
6. If your proposal is further shortlisted for detailed development, the approach for funding will be discussed and you may be asked to fill up further application forms to include finer details on your proposed solution. Do also note that you may be required to co-fund part of the solution development trial, subject to the respective funding guidelines.
7. Any documents submitted will be treated as confidential and not be returned. By submitting any documents, you hereby consent to any disclosure by LTA of your documents to the Government of Singapore, the relevant Government Agencies, and/or government-related agencies, as LTA considers appropriate in our discretion for purpose of evaluation in this Call for Solutions.
8. Notwithstanding any other provision in this Call for Solutions, LTA may amend, suspend or withdraw all or any part of the Call for Solutions or the Call for Solution process, which will be informed via the Land Transport Innovation Portal.

7 CONTACT US

Should you have any further queries regarding this Call for Solutions, please direct them via email to inno@lta.gov.sg.