Statement Number	1
Launch Date	15 September 2023
Closing Date for Submission	26 October 2023

Title	Improving security surveillance, situational awareness and incident response in JTC's industrial estates
Background	JTC is custodian to 11% of Singapore land area, which covers industrial estates (mainly), infrastructure, and land earmarked for development. As part of the security measures, we have security officers deployed for patrol responding to incidents in our area of interest.
Challenges	For lands earmarked for development (undeveloped lands), **thick vegetation** would usually be present, and this poses a security concern. With thick vegetation and no proper access routes, it limits the use of security patrol vehicles to access the area and instead **on-foot patrol is required**. To compound issues, **power and communications infrastructure may not have been laid/deployed yet**, making it manpower intensive and unsafe. JTC estates cover large areas and are expansive. When we respond to incidents, it is best to have a **preliminary/early appreciation of the situation so that the appropriate assets can be deployed** to these incidences in a timely manner. At certain remote sites with lack of surveillance equipment and communication infrastructure, the command centre will not have an initial assessment until resources are deployed on site and reports back the situation, where extra time is taken up due to this gap. In certain tenanted land spaces, there are conditions where JTC security is not allowed to capture images/videos and cannot trespass into tenants' compounds without prior permission. In order to perform security ops without breaching this condition, on-foot patrol and manual methods of reporting are currently practised, which has further room for improvement.
Desired Outcomes	The envisioned solution should be able to automate and/or improve the productivity of the following activities, without the need for a system overhaul or expensive infrastructure to be in place: 1. Conduct inspection of remote areas with thick vegetation; 2. When conducting inspection, circumvent the challenge in capturing surveillance data without breaching the privacy of tenanted lands; 3. Transfer inspection data to an existing command centre in areas with low/weak communication bandwidth; 4. Help officers perform their assessment of the data captured to enhance surveillance and response to incidents.

	The solution is also expected to allow end users to reap the gains in manpower productivity and/or cost savings in a direct and apparent manner.
Requirements	<u>General</u> • There should be sufficient technical details on the solution's working principles/approach, and the justification for the selected approach. • Proposals includes a feasible method/approach to quantify and verify potential time & cost savings to JTC operations. Expected cost-benefit should be compared to conventional ways of responding to incidents. • Proposal includes the operations and maintenance plans of the solution hardware and software. This includes coverage for damages to hardware during the course of the trial. • Proposal includes a baseline operation workflow to be used in conjunction with the technology solution to be developed. <u>Processes and workflow</u> • Elaborates reasonable operational workflow incorporating the proposed solution with <u>sufficient details</u>. • Explains how the proposed solution is expected to enhance in-land patrol (currently done by conventional roving patrol by vehicle and foot and information gathered are based on officers' observation. Cameras are used to capture footages but in certain sensitive areas, tenant buildings are avoided). • Explains how the proposed solution is expected to enhance Incident Response (currently as follows: i) manual reporting of incident to command centre; ii) command centre dispatches patrol officers to identified location for further info gathering/prevent further damage/escalation of incident/lifesaving procedure if necessary; iii) command centre makes decision to escalate (SPF/SCDF/JTC management) and sends alerts to tenants/lessees whom may be affected; iv) Maintain scene until authorities arrives to take over or resolve situation and close case ; v) Post-incident reporting). <u>Solution</u>

	• Proposal identifies and suggest methods to mitigate challenging environmental conditions – remote areas with no communication infrastructure, areas with thick vegetation, areas with tenanted lands and high sensitivity (privacy).
	• Proposed solution automates the detection of anomalies and incidence of interest (trespasser, illegal activity) and operates across challenging environment conditions (poorly lit, heavily vegetated).
	• Proposed solution is able to better provide early information of incidents to JTC and/or tenants.
	• Provisions made in project timeline to finetune the workflow processes with JTC's Security team.
	• Applicants make provision to comply with relevant authority regulations (e.g. drone-based solution need to comply to CAAS Air Navigation Act, systems solution to comply with IM8 requirements etc) i.e. system where individual agencies (besides JTC) can enter and give required approval must fulfil IM8 requirements.
	• Proposal includes proposed tasks to be automated and justifies reason to automate the tasks (frequent task or most time-consuming task, etc)
	• Proposed solutions would lead to reduced patrol frequency without compromising presence, security response and situation awareness. The proposal to include an elaboration on this.
	• Proposal includes method for the generated data to be securely used, transmitted and stored within Singapore or a specific location or a specific organisation(s).
	• Proposed solution does not require costly permanent infrastructure to be specially built for its deployment. Could suggest tapping on an existing commonly available infrastructure, where the additional cost is marginal.
Possible Solutions	Solutions in consideration could cover the following areas, or even combined to formulate an innovative solution to address the challenge: - Robotics / teleoperated solutions - Digital automation - IoT and sensors - Wearables and auxiliary equipment

Development Timeframe	Keep it within 12 months

Applicants should include their own proposed development timeframe (12 months) stating the reasonable milestones, taking into consideration of the requirements of the challenge statement.

The following is only an example of a development timeframe:

Milestones	Timeline
Interview security operators to better understand the operational needs and how the proposed solution could be utilised to achieve intended outcomes.	by month 1
Develop/customise solution to fit the operational needs and device an implementation plan for the subsequent trials. Project report 1.	by month 3
1st round of refinement	by month 6
Develop and demonstrate solution for security patrolling to stakeholders. Progress report 2.	
2nd round of refinement	by month 9
Develop and demonstrate solution for security patrolling and incident response. Progress report 3.	
3rd round of refinement	by month 11
Final round of trial and demonstration to stakeholders.	
Final project review, project closure report & technology disclosure (if any). Project closure report includes recommendations by applicants on scaling plan, commercialisation, and operational and maintenance plan.	by month 12

Evaluation Criteria	**60%** quality of Proposal (scope of work, operational feasibility, disruption to operations, experiences and skills, cost benefit analysis, commercialisation and implementation plans); and **40%** price (reasonableness of project cost and value for money, co-funding and contribution in-kind).
Testbed/ Trial site (envisioned deployment site)	JTC estates at Tuas (western region of Singapore).

Payment model	Fixed priced, payment by milestones
Additional Info	Nil.