



Tender Ref No: JTC20T0045

27 July 2020

To: All Applicants

## CORRIGENDUM NO. 1

### JTC INNOVATION CHALLENGE: PHASE 1 - AUTOMATION AND PRODUCTIVITY

Please take note of the following clarifications to the above Innovation Challenge in response to some queries raised by applicants, which shall form part of the original Innovation Challenge document issued.

S/N	Query	Response
<u>General</u>		
1	For the proposal document to be uploaded, do Applicants need to follow any template?	<p>Please follow the Project Proposal template provided on the gov pact site.</p> <p>Any proposal not submitted according to the instructions contained and in the form(s) prescribed in JTC Innovation Challenge, or which attempts to vary any provision of or which fails to fully comply with this Innovation Challenge, is liable to be rejected.</p>
2	Where can I find the list of qualifying cost that can be funded by this innovation challenge?	<p>JTC does not have a fixed list of qualifying cost. Guidelines is that all items submitted must be clearly project-related, such as: manpower cost, equipment (additional modules), consumables, other operating costs (software licence, transporting prototype to site, etc).</p> <p>Please do not include items that do not have clear and direct link to the project, as it will affect the price-aspect of the evaluation.</p>

S/N	Query	Response
3	Does the budget support overseas travelling and research publication?	The funding does not support overseas conference travel.
4	For Universities and Research Institute, do we need to submit the Declaration on Financial Solvency document?	Yes, please select the appropriate authority to make that declaration.
5	As a research institute, we charge overhead for ongoing costs to operate our institute, where do we include this.	Yes, you may include it under other operating cost.  Do note that the total funds requested, inclusive of the overheads, should not exceed \$250,000.
6	Can a research group in university/ research institute apply to the innovation challenge without partnership from SME?	Yes, the application is also open to academia.  JTC encourages collaboration with commercial entities to facilitate the eventual deployment on JTC sites/estates in a commercially viable manner.
7	Please confirm that the maximum funding for Challenge Statement 1, 2,3 is S\$ 250,000 with a maximum project duration of 1 year.	Awarded projects under the various Challenge Statements will each have individual funding of up to \$250,000 and a project duration of up to 12 months.
8	Please clarify if the Proof of Concept and Prototype Development to be done by the vendor after award of the work and within 12 months timeline and maximum limit of S\$250,000 cost for the project.	Proposal's scope of work should be related to Proof-of-Concept (POC), Prototype Development, and trials/testbeds. Please refer to the respective challenge statement's specific requirements.
9	Please confirm that JTC may jointly commercialise the implementation with the vendor and share revenue in agreed percentage as per Schedule 3 of the Innovation Challenge Agreement in prescribed format.	The Applicant shall take the lead on commercialisation of the technology.  The share of revenue by each party on the commercialisation of the technology will be in agreed percentage as per Schedule 3.
10	Please clarify if foreign companies with GeBIZ registration can submit proposal in consortium with locally registered company in Singapore.	Foreign companies can apply, as long as:  i) The company has a GeBIZ registration upon award, and subsequently

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		<p>ii) submit their electronic invoice through vendors@gov.</p> <p>JTC encourages the Applicants to have local presence as JTC's estates and development are in Singapore, to facilitate any demonstrations, and provide timely engineering support.</p> <p>Approved funding will be made to the applicant whose submission has been accepted by JTC. Applicant should have their own arrangement with their partners or associates.</p>
11	Please clarify if any cost of collaborating with Public Agency Staff proposed by the vendor will be borne by JTC directly.	<p>Cost related to collaborating with public agencies will be borne respectively by the public agency as a contribution in-kind.</p> <p>Applicants shall list clearly the various parties which it is collaborating with in their proposals.</p>
12	Is it possible to get a temporary access to the current digital platforms, so as to prepare an example for the proposal submission?	JTC will provide open access to the system after the awarded Applicant has successfully demonstrated their solution's values with positive outcomes and show great potential to be developed into an cost-effective and easy to implement tools at scale for JTC's adoption.
13	<p>The cooperation with third parties (mainly in the Post-inspection phases) and the capabilities to exchange data with these third parties is a very important point.</p> <p>Does JTC already have existing APIs to exchange data with third parties?</p>	<p>i) JTC's Open Digital Platform (ODP) provides the platform for data exchange with third parties. Applicants can provide APIs to JTC for data exchange.</p> <p>ii) The developed solutions that are found to be suitable and assessed to have potential may be selected for integration to the Living Lab instance of the ODP for testing and evaluation.</p> <p>iii) Currently supported APIs include, REST, MQTT, DDS, OPC. Applicants may propose other protocols for JTC review and consideration</p>
14	What software and standards have been implemented for current BIM modelling?	JTC recommends to use REVIT 2019 and above for BIM modelling.

S/N	Query	Response
<b>Challenge Statement 1: Virtual InSpection which Omits Manual processes (V.I.S.I.O.N)</b>		
15	Can we have an idea which estate will be used as the testbed and what facilities that the Applicant can make use of for the solution?	<p>Applicant may assume that the solution would only be deployed for one industrial estate for the works within this Innovation Challenge.</p> <p>The vehicle for data collection shall be included in the Applicant's proposal.</p> <p>Applicant shall assume current estate security cameras are not of sufficient resolution to have meaningful detection of faults.</p>
16	Are there any example of images which can be provided?	<p>Applicants are required to gather images on their own.</p> <p>However, please refer to <b>Attachment 1</b> (please access via the Gov Pact website : <a href="https://gov-pact.ipi-singapore.org/grant-call/jtc-innovation-challenge">https://gov-pact.ipi-singapore.org/grant-call/jtc-innovation-challenge</a>) for some sample images.</p>
17	<p>What is the current process flow? Is the Applicant expected to adhere to the current process follow?</p> <p>Does JTC already use a workflow for the rectification of issues?</p> <p>If so, is it a web/mobile application?</p> <p>If not, do you consider our proposal should include the workflow to help JTC follow-up on the issues until completion of reparation/ remediation?</p>	<p>Please refer to the <b>recorded briefing</b> (available at: <a href="https://www.youtube.com/watch?v=BSAGyS acgFs&amp;feature=youtu.be">https://www.youtube.com/watch?v=BSAGyS acgFs&amp;feature=youtu.be</a>) for current process flow.</p> <p>The Applicant can suggest a more efficient workflow with the proposed solution, thereby achieving the desired outcomes.</p>
18	Are there any top priority defects of which JTC would like the Applicant to focus on?	<p>The current defect list is as follows:</p> <ol style="list-style-type: none"> <li>1. Road potholes</li> <li>2. Faded road markings</li> <li>3. Damaged roadside kerbs</li> <li>4. Damaged pedestrian pavements</li> <li>5. Damaged fences/ railings</li> <li>6. Damaged road signage</li> <li>7. Illegal parking</li> <li>8. Illegal dumping</li> <li>9. Encroachment</li> </ol>

S/N	Query	Response
		<p>10. Overgrown vegetation 11. Ailing tree health (unhealthy/ slanting trees etc.)</p> <p>The top defects to be prioritised in this Innovation Challenge shall be:</p> <ol style="list-style-type: none"> <li>1. Illegal parking</li> <li>2. Encroachment - including protruding tree branches, encroachment on space</li> <li>3. Road potholes or depression</li> <li>4. Faded road markings and signage</li> <li>5. Damaged roadside kerbs</li> </ol>
19	Does JTC want to monitor any other environmental data such as noise pollution or weather conditions?	Unless the environmental data (weather and noise pollution) is relevant to detecting the list of defects, JTC does not foresee a need to monitor it.
20	Are we allowed to install video-cameras or sensors on JTC property during the POC?	Yes, Applicants will need to cost it into their proposals if they intend to do so.
21	How many photos does the JTC process manually (monthly) in the inspection & verification process?	About 200 to 300 images.
22	Is capturing videos from a drone relevant for the VISION needs? Is there any restriction from a legal standpoint with flying drones over the JTC lands?	<p>JTC is not prescribing the mode and platform to acquire data for defects detection, Applicants are free to propose.</p> <p>For drone operations, Applicants will apply to Civil Aviation Authority of Singapore (CAAS) for permission to operate, even when flying above JTC land. If selected, JTC will support the project in getting authority approvals, by involving the respective authority in the project or work with the Applicants to secure these permissions.</p>
23	Does JTC intend to expose some data/services developed in the VISION project to third parties or is it only for internal purposes to gain productivity?	<p>For matters related to data, please refer to clause 16 of the specimen Project Agreement.</p> <p>For services developed for VISION project, it will be for internal productivity gain, which will include the contractors.</p>

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		Applicants can subsequently market the developed solution beyond JTC.
24	Does JTC currently use a GIS (Geographical Information System) to report the faults/issues?	JTC has a Report-a-fault mobile application, where users can snap and send fault/ defects request.
25	How is JTC planning to use the current BIM modelling practice for inclusion in proposed solutions for Challenge Statement 1?	For Challenge Statement 1, JTC did not prescribe a BIM-based solution. Applicants intending to propose a BIM-based solution should articulate the reason in doing so.
<b>Challenge Statement 3: Augmenting Safety Inspections for Building and/or Infrastructure Construction Sites</b>		
26	The problem statement is on utilising existing CCTV infra for safety inspection. However, if additional cameras should be installed for better performance during field testing, should the additional cameras be budgeted for under the proposal?	<p>Broad based assumptions shall be made during the submission of the proposal, e.g. the land area of a site and the coverage per camera leading to the costing of additional cameras required.</p> <p>Applicant should include the necessary assumptions and additional number of cameras required for the solution to be effective to demonstrate the end outcome in the problem statement.</p>
27	Is there a list of potential risky objects: uncovered holes, openings and gaps in fencing leading to falling from heights?	JTC's key objective is to seek for a practical and economical solution to have maximum safety inspection coverage at all time (24/7), in all weather and all lighting environment at the construction site to make up for the gap in routine safety inspection walk.
28	Is there a list of unsafe actions? E.g. this might include running, horsing around, not wearing safety helmet, drinking alcohol?	<p>Therefore, JTC does not stipulate the mandatory lists of risky objects and unsafe actions requirement but have given some examples in the online briefing presentation.</p> <p>In all cases, the proposed solution should place priority in capturing high risks, unsafe situation/environment (resulting in death and serious injuries) at construction site in a timely manner to allow for intervention to take place to prevent accident from happening.</p>

S/N	Query	Response
29	How is JTC planning to use the current BIM modelling practice for inclusion in proposed solutions for Challenge Statement 3?	It is not a requirement in the POC stage but Applicant may propose how their solutions can be integrated to existing main stream BIM model. It is important for the proposed solution to have the capability to accurately locate the position of the identified safety hazard and alert the relevant safety personnel for intervention.
30	How is JTC planning to integrate Challenge Statements 3 solutions into JTC's existing digital platform?	The end goal is to integrate the augmented safety inspection solution and data into JTC Common Data Environment (OPTIMUS). Details of how to integrate with OPTIMUS will only be discussed at the later stage with the awarded Applicant after the POC stage.
31	What are the status of BIM models (for intended development project) to be included in proposal for Challenge Statement 3?	There is no intended development project at this stage. You may assume the architectural BIM model is fully developed with all necessary information on the building/infrastructure.
32	Can JTC nominate a couple of development site examples for us to prepare an example for the proposal submission for Challenge Statement 3?	The proposed system shall be able to be applied to any typical industrial building or infrastructure construction site in Singapore. Specific development site will be shared with awarded Applicant subsequently.
33	What type of CCTV camera and Crane AI Camera is currently in use within JTC facilities and by JTC partners?	JTC is using off-the-shelves CCTVs in the current constructions sites. JTC is seeking for solutions that are reliable, accurate but also cost-effective during implementation.
34	What is the data accessibility for CCTV cameras and Crane AI Cameras? Can JTC provide an example of typical data	Actual data will be collected on site during the POC project. If the proposal involves tapping data from the existing CCTV cameras, JTC will work with the contractor to allow the awarded Applicant to access and retrieve the relevant "non-sensitive" site data for the solution development. However, all these data belongs to JTC, applicants will have to hand over all data shared by JTC and its contractor at the completion of the project.

S/N	Query	Response
35	What are the specifications, data standards, interface management protocols and security certificates for the current digital platforms, IOT and internet infrastructures?	Specifications, data standard and etc for OPTIMUS, JTC's Common Data Environment, shall only be discussed after the solution developed is proven to be effective. The key focus at this stage (Proof-Of-Concept) is for the Applicants to demonstrate that their solution/concept can provide all time (24/7) safety inspection and monitoring with maximum construction site coverage in all-weather and all-lighting condition. The solution shall have predictive capabilities to identify potential risks and provide timely alerts for interventions/remedy actions to take place to prevent accident from happening on site. The solution shall be able to track, monitor and document the response taken to rectify/mitigate the alerted risks.

Yours faithfully,

Ivy Sim  
 Senior Contracts Manager  
 Contracts & Procurement Division  
 (This is an electronic document. No signature is required.)