

Annex A – GIC 2021 Challenge Statements

(a) GIC 2021 Challenge Statement – Details

S/N	Challenge Statement	Background
1	Real-time Identification of Prohibited Organic Compounds in Sewers How might we identify and quantify the presence of specific prohibited organic compounds in wastewater for timely intervention?	The presence of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in wastewater disrupts PUB's operation to reclaim and treat wastewater. The highly treated reclaimed wastewater becomes "NEWater", which serves 40% of Singapore's water needs. The source of VOCs / SVOCs often traces back to wastewater from industrial premises, especially when new chemicals are being used. We are interested in exploring different types of sensors and measuring devices that can quickly detect VOCs and SVOCs. The solution would ideally be able to detect and quantify individually the entire range of 30 prohibited organic compounds stipulated in the First Schedule of the Sewerage and Drainage (Trade Effluent) Regulation [SD(TE)R].
2	Mapping of Underground Utilities How might we detect, identify and map out underground utilities without the need for excavation?	Pipe construction (water/sewer) typically involves deep shaft excavation, open-cut, micro-tunnelling, and pipe jacking works. Prior to carrying out any work, it is critical to identify all existing underground utilities and verify their exact locations and depths, so as to prevent damaging them or to divert them before constructing the pipes. We are interested in non-excavation solutions that support the detection and identification of underground utilities without any interference/disruption to the utilities and their environment. The solution needs to determine the type of utilities so that we can consult the relevant utilities owners for further action. Ideally, it would also be able to indicate the width and materials (ductile and cast iron, steel, reinforced and polymer concrete, vitrified clay, HDPE and PVC) of the detected underground services for further validation of the results.
3	Cost-Effective Rainfall Monitoring How might we deploy a cost-effective solution to greatly increase the spatial coverage of rainfall monitoring?	Due to the convective nature of Singapore's weather system, the rainfall in Singapore can vary significantly spatially and temporally. It is important that PUB obtains adequate rainfall data to support decisions to deploy flood management resources. Singapore experiences an average of 167 rain days in a year, including 31 to 73 days (based on 10 years of data) classified as heavy rain days. We are interested to enhance our rain monitoring network by sourcing low-cost sensors that can be deployed more widely and flexibly. The sensors need to measure precipitation (mm) and transmit the data wirelessly in real time. They shall also be appropriately sized to be retrofitted on top of public infrastructure such as lamp posts, bus stops, moving buses or HDB flats. These rainfall measurements at street scale resolution would support PUB in the deployment of its flood management resources during heavy rainfall.

4	Innovative Solutions for Coastal Protection How might we deploy coastal protection measures that better utilize land (when compared with conventional measures) and are adaptable to future requirements, like from rising sea levels?	Singapore, a land scarce city-state, is planning for large-scale coastal protection works to adapt to sea level rise. As coastal protection measures take up premium waterfront space, we are looking for innovative solutions that use land more efficiently; being adaptable to meet higher than projected sea level rise and able to incorporate nature-based solutions, as well as multi-functionality and liveability. We are interested in exploring: • Solutions that can protect our coastlines from rising sea levels as well as erosion by waves and storms and reduce the landtake for such measures without compromising on structural stability. • Innovation in material science and construction engineering that allow incremental enhancements of coastal protection measures in future, or reduce disruption and disturbance to existing measures • Innovative techniques that incorporate nature or urban landscape features into our coastal protection measures. Nature-based solutions can complement engineering solutions and protect and sustainably manage the environment and biodiversity.
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(b) Application Process

 GO.gov.sg https://pub.gov.sg/puboi	Submit your application for evaluation and potentially secure a pitch interview with our expert panel. Selected applicants will receive attractive funding and benefits to pilot their solution with PUB. To learn more, visit https://pub.gov.sg/innovationchallenge or scan the QR code.
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(c) Application Deadlines

Application	Evaluation	Interviews	Pilot
Ongoing	August 2021	September 2021	Oct 2021 onwards
<i>Applications close on Tuesday, 10 August 2021, 2359hrs (UTC+8).</i>			

(d) Information Session

Info Session	Join our interactive webinar to understand what our Challenge Owners are looking for.
Register now  https://go.gov.sg/pubgic21info	Date: Wednesday, 14 July Time: 4.00 pm - 5.30pm (UTC+8) Programme • Introducing PUB Global Innovation Challenge • Challenge sharing and Q&A

