

Annex A

Land and Liveability National Innovation Challenge (L2 NIC)

Launched in 2013 by the Ministry of National Development (MND) and National Research Foundation (NRF), the L2NIC is a long-term, multi-agency effort that recognises land as a precious resource to Singapore, and seeks to leverage on R&D to provide sustained capacity and options for future generations.

2 The vision of the L2 NIC is to support an economically vibrant, highly-liveable and resilient city of the future with land capacity for sustained growth. This will be achieved through the integrated development of R&D in (i) Creating new space cost-effectively and (ii) Optimising the use of our existing land, while maintaining liveability. These areas will be supported by R&D in enabling Information and Communications Technologies (ICT) and platforms, and integrated with social and behavioural sciences to ensure that the solutions proposed would also address the people's needs and acceptance.

3 The 1st Call of Proposals under L2 NIC was launched in November 2013 and closed in January 2014. The Call looked at four focal areas, including creation of space, optimising the use of land, creating highly liveable residential towns; and supporting Information and Communications Technologies (ICT) and platforms. It saw 10 research projects being awarded, from 78 submissions, in research areas including microclimatic modelling, biophilic town, underground spaces, noise mitigation and ageing-in-place. For more information on the projects, please visit <http://app.mnd.gov.sg/LandLiveabilityNIC/AwardedProjects.aspx>.

Details on 2nd Call for Proposals

4 The 2nd Call for Proposals is open from 9 July to 20 August 2015 to invite creative solutions to meet three challenge targets under two main areas: (i) improving cost-effectiveness of underground developments, and (ii) improving human comfort and well-being; and enhancing environmental resilience.

a) Challenge 1: To reduce cost of underground developments by 50% through innovations in -

i) Underground excavation and temporary supports and

ii) Mechanical and Electrical (M&E) works (eg. Fire protection, safety, mechanical ventilation etc)

while maintaining, or even reducing, recurrent and maintenance costs.

As land is a limited resource, Singapore will continue to explore and invest in potential alternatives and build up relevant capabilities to meet its long-term land requirements. Development of underground spaces would continue to be one of the key strategies to addressing land scarcity in Singapore, yet it faces limitation due to high development costs.

Thus, this challenge aims to solicit unconventional yet impactful research proposals that will improve the cost-effectiveness in underground developments to achieve 50% reduction in current costs, while maintaining or even reduce the recurrent and maintenance costs.

b) *Challenge 2: To reduce ambient temperature by 4°C of residential housing estates (Thermal Comfort) –*

Urbanisation gives rise to common issues related to environmental quality and liveability. As a highly developed and densely populated tropical country, Singapore is affected by Urban Heat Island effect, resulting in high ambient temperature, reduced ventilation and wind speed. Therefore, one of the challenges in ensuring liveability is to enhance thermal comfort.

The proposed R&D solutions should lead to a reduction in ambient temperature by 4°C in residential housing estates, applicable to both green-field (new estates) and brown-field (existing estates) sites in Singapore. As ambient temperature is closely related to energy and water related issues, the proposed solutions are strongly encouraged to be well-integrated with technologies that address energy and water related issues.

c) *Challenge 3: To reduce ambient noise levels by 10dBA in residential housing estates while maintaining natural ventilation (Aural Comfort) –*

A growing population within a limited space would inevitably face challenges related to people living in close proximity to one another, ambient noise being one of them.

Proposals submitted for this challenge should target to improve the aural comfort for residents staying in residential housing estates through reducing ambient noise levels by 10 dBA. The proposed solutions could be targeted at reducing general ambient noise levels for different noise types such as (i) economic noise (including construction, traffic, businesses, etc.) and (ii) community noise (including neighbourly, community spaces, animals, etc.) but they should not be intrusive or compromise natural ventilation while reducing noise levels.