

## Annex A - Update on Singapore's ongoing 5G efforts

Singapore's vision is to be a global front-runner for innovation in 5G applications and services, supported by a thriving 5G innovation ecosystem as well as a high-performance, secure and resilient 5G infrastructure.

- **5G Living Lab@PIXEL:** IMDA's innovation space, PIXEL, added this 5G testing facility on November 2020, for industry to ideate, prototype and build applications in 5G. Enhanced with 5G connectivity, PIXEL will facilitate industry efforts to develop new 5G solutions and build up technical capabilities, all businesses, including SMEs, to experiment and testbed with their 5G applications and use cases. Projects are supported with design-centric capabilities to enhance the digital experiences.
- **Cloud Gaming:** IMDA, Razer and Singtel announced Singapore's first 5G cloud gaming trial in October 2019. The technology trial will assess 5G's ability to meet the demands of cloud gaming. The trial will also look into how to design low latency cloud gaming hardware to deliver a quality gaming experience, and a broader range of gaming experiences. The trial is currently ongoing.
- **Urban Mobility and Smart Estates:** Announced in October 2019, CapitaLand partnered Navinfo Datatech and TPG Telecom to create a 5G-enabled smart estate in Science Park 1 and 2. CapitaLand will leverage the ultra-high speed and ultra-low latency capabilities of 5G standalone networks at those sites to deploy and test innovative estate-level solutions. It is currently testing a 5G-enabled Cellular Vehicle-to-Everything (C-V2X) technologies for Smart Estates mobility solutions in a commercial space. The 5G-enabled Smart Urban Co-Innovation Lab has launched in October 2020, trials are on-going.
- **IMDA-Microsoft MOI:** IMDA and Microsoft signed a MOI in November 2019 to offer a 5G development environment. This site will be connected to PIXEL as part of Microsoft's Centre-to-Centre collaboration programme to facilitate efforts to create new 5G applications, services, and capabilities.
- **Urban Mobility:** M1 and the Nanyang Technological University (NTU) are collaborating to deploy 5G technology at the university's campus. The deployment,

announced in October 2019, will enable NTU to expand its current C-V2X communications trials on autonomous vehicle, traffic infrastructure and unmanned aircraft systems to use 5G. Companies will also be able to design and test their connected mobility solutions on the campus-wide testbed. This project, which is ongoing, is supported by the A\*Star, NRF and the Singapore Economic Development Board.

- **Industry 4.0:** IMDA, M1, IBM and Samsung announced Singapore's first 5G Industry 4.0 trial in May 2020, to demonstrate the transformative impact of 5G for enterprises and drive the next bound of Singapore's digital economy. The trial aims to develop insights and showcase benefits of 5G in Industry 4.0. This trial is on-going.
  - **Industry 4.0:** Singapore's Agency for Science, Technology and Research's (A\*STAR) Advanced Remanufacturing and Technology Centre (ARTC), JTC and Singtel signed a memorandum of understanding in 2019 to develop Industry 4.0 solutions based on 5G technology.
  - **Maritime Operations:** Supported by IMDA and MPA, M1 has partnered Airbus to conduct coastal 5G standalone network trials at the Singapore Maritime Drone Estate. This use case, announced in June 2020, aims to assess 5G standalone network performance in real-world environments to ensure that unmanned aerial vehicles can operate safely and efficiently during all phases of their flights.
  - **5G Talent:** In September 2020, IMDA partnered with Singapore's Mobile Network Operators ("MNOs") to hire and reskill 1,000 professionals to support Singapore's 5G rollout. Of these, 30% are new roles, while the remaining are telecom professionals who will be upskilled in the areas of 5G network, cyber security and solution engineering to futureproof their jobs. The demand for 5G professionals is expected to grow as Singapore's 5G rollout gathers momentum and more enterprises participate in the ecosystem.
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