Positioning Infrastructure and Indoor Positioning

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SUMMARY

The Positioning Infrastructure in Hong Kong has been evolved from a passive Geodetic Survey Control Network to Continuously Operating Reference Stations (CORS) to support high accuracy satellite positioning using GNSS anytime and anywhere in the past decades. While smartphones, smart sensors and Internet of Things (IoT) technologies can be found everywhere in a smart city, the demand and expectation of positioning have been expanding. As a result, the developers and managers of the positioning infrastructure must be fully aware of the trend to cater for the changing needs.

The Innovation and Technology Bureau (ITB) of the Government of Hong Kong Special Administrative Region has set up a TechConnect block vote to support Government departments in Hong Kong in planning and implementing technology projects, so as to enhance operational efficiency and improve public services by use of technology. In response to the initiative, a pilot project to explore, set up and test a ubiquitous positioning infrastructure covering both outdoor and indoor environments for potential smart city applications was proposed. The project aims to identify suitable and cost-effective Positioning, Navigation and Timing (PNT) technologies, to design, test and develop the infrastructure in a selected pilot project area, to evaluate the effectiveness and performance, to understand the limitations and concerns and to provide recommendations for review and consideration of the way forward if wider implementation is required in the future.

The project will start from a baseline study of the current situation of the development of various location-based applications, the technologies deployed, architectures of the supporting infrastructure, and the stakeholders involved. The project team will review the international standards and technological trends, as well as legal, social and ethical requirements by case study and stakeholder engagement. Based on the findings, a prototype infrastructure in a pilot project area

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would be designed, implemented, tested and evaluated. Demo applications would be developed to understand the effectiveness, limitation and potential of such prototype infrastructure.

From the experience of the pilot project, common standards, specifications and technological guidelines would be proposed to facilitate the potential applications or infrastructure developments. Last but not the least, the experience learned will be summarized, which will help the evaluation of the financial, technological, practical viability and constraints of various technical options.