Application of Backpack Mobile System for Tree Survey

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SUMMARY

The Greening, Landscape and Tree Management Section (GLTMS) under the Development Bureau of the Hong Kong Government was established to champion a new and strategic policy on greening, landscaping and tree management, with a view to achieving the sustainable development of a greener environment for Hong Kong. At present, there are 1.2 million individual trees with data maintained by different government departments. It is estimated that information of more trees will be maintained from time to time and will have more than 1.7 million tree records eventually which require regular updating by the departments. The Survey and Mapping Office of Lands Department together with GLTMS are actively exploring the use of suitable technologies to assist in identifying or monitoring problematic trees, in which Backpack Mobile Mapping System (BMMS) which integrated 3D laser scanner with positioning system was one of them. Global Navigation Satellite Systems (GNSS) and Inertial Measurement Unit (IMU), or Simultaneous Localization And Mapping (SLAM) technology are the two main positioning techniques widely used by BMMS. And this paper examines the application of these two kinds of BMMS for collecting individual tree information, including location, tree height, crown spread and diameter at breast height (DBH), for different tree sites in Hong Kong. The feasibility, accuracy and limitation of the two types of BMMS for collecting tree information were compared and assessed. Recommendation for use of BMMS on tree information collection and validation for different tree sites in Hong Kong was also made.