For discussion
on 27 February 2018

LEGISLATIVE COUNCIL PANEL ON DEVELOPMENT

Landscape and Tree Management Work in Hong Kong

PURPOSE

This paper briefs Members on the landscape and tree management work in Hong Kong.

BACKGROUND

2. Landscape and trees are integral parts of our outdoor environment. They contribute to our quality of life by providing passive amenity, moderating temperature, improving air quality and enhancing the visual appeal and biodiversity of our densely built-up city. In March 2010, the Greening, Landscape and Tree Management Section (GLTMS) was established under the Works Branch of the Development Bureau to take up the overall policy responsibility for formulating and coordinating landscape and tree management strategy and initiatives in Hong Kong.

3. The GLTMS is underpinned by the Greening and Landscape Office (GLO) and the Tree Management Office (TMO). The two offices work in close cooperation to promote a holistic approach, embracing adequate space allocation for new planting, proper selection of planting species, as well as quality landscape design and planting practices in the upstream, and proper vegetation maintenance in the downstream, with protection of public safety as a priority consideration. The GLO is responsible for central coordination of the Government's greening and landscape planning and design efforts, while the TMO for advocating the adoption of a professional approach to tree management among tree management departments and in the community at large.

4. We have established the Community Involvement Committee on Greening (CICG) and the Urban Forestry Advisory Panel (UFAP) to seek expert advice from recognised practitioners and to engage the community and industry

stakeholders. The CICG comprises 12 local and overseas members representing green groups, educators, industry and community stakeholders, and property management representatives. The non-official members together with representatives from tree management departments discuss initiatives to encourage quality landscape and tree management in our community.

5. The UFAP comprises 18 local and overseas expert practitioners on urban forestry management, urban arboriculture, tree risk assessment and management, forest pathology, urban ecology, soil science, landscape architecture, horticulture and geotechnical engineering. The inter-disciplinary panel provides advice on the formulation of policies, strategies and measures in relation to the effective management of Hong Kong's tree assets.

6. The terms of reference of the CICG and the UFAP are at **Annex A** and **Annex B** respectively.

LANDSCAPE MANAGEMENT

7. The GLO serves as the central authority and coordinator of landscape efforts, including the setting of policies and guidelines to deliver high quality landscape planning and design. The GLO focused on identifying suitable greening opportunities at the planning and design stages of development projects and promoting proper planting practices in pursuance of healthy and sustainable urban landscapes.

8. The quantity of new planting in government projects totalled approximately 82 million plants, including 9.1 million trees[1] in the past ten years. However, vegetation only forms a part of our urban landscape. Taking a holistic approach, the urban context along with hard and soft landscape factors must also be considered in a comprehensive manner to maximise safety and enjoyment for the community. To this end, circulars and guidelines to enhance our urban landscape in pursuit of liveability and sustainability objectives have been promulgated, such as the circulars on the "Site Coverage of Greenery for Government Building Projects" to achieve a quality and sustainable built environment, and the "Allocation of Space for Quality Greening on Roads" to mandate the provision of adequate space for greening on at-grade public roads to promote quality planting works for our street environment.

[1] The 9.1 million trees planted include 6.6 million in country parks and 2.5 million in built-up areas.

9. The health of trees and vegetation starts with a favourable landscape from the outset to facilitate their subsequent maintenance. The concept of "greening" has matured over time into a holistic and integrated approach of the planning and design of urban landscapes, through to the implementation and life-cycle management of urban forests. A number of trees planted in the past might have been suitable for a particular location at that time. However, some trees, such as afforestation planting on slopes, have out-grown their compact urban environment or are reaching the end of their life-cycle and are no longer appropriate.

10. Trees grown in the past are gradually due for replacement, presenting opportunities for the adoption of sustainable landscape strategies and practices. These include the principles of "Right Tree Right Place", improving soil quality and increasing vegetation diversity. An example is replacing senescent *Acacia* with a palette of native and naturalised plant species by the Highways Department to address public safety as well as to improve the biodiversity and resilience. Our designed landscape can also help make Hong Kong more resilient to severe weathers. An example is the Rain Garden at the intersection of Princess Margaret Road and Wylie Road by the Civil Engineering and Development Department to help ameliorate stormwater runoff.

11. A landscape of healthy vegetation is one of the most effective prevention strategies to safeguard tree health and public safety. A diversified plant community increases resilience to pests and diseases, thereby guarding against significant loss or premature decline of trees. A study to develop a practical guide for selecting trees and complementary community plant mixes suitable for Hong Kong streets is currently under finalisation. The guide supports strategic street tree planting and urban forest management, with the objective to achieve sustainable, healthy and resilient streetscape and minimise tree decline and failure.

TREE ASSET MANAGEMENT

12. Our urban forest is a valued asset that requires a holistic approach when managing and maintaining the individual trees within it. Like other living organisms, trees grow, age, and eventually decline. The management of this life-cycle is important in minimising tree risks to an "as low as reasonably practicable" level for safeguarding public safety while replenishing and regenerating our urban forest.

13. The Government adopts a five-pronged strategy that includes undertaking the annual Tree Risk Assessment and Management as part of the precautionary measures before the wet season, implementing a dedicated regime for high-risk trees, promoting proper tree care on private properties, building capacity in the workforce, and stepping up community education and involvement. Given the large number of trees across the territory, the Government adopts an "integrated approach", under which departments are responsible for managing the trees in the facilities and land under their purview, with the GLTMS as the overall coordinating authority.

Tree Risk Assessment and Management (TRAM)

14. The GLTMS has promulgated the Guidelines on Tree Risk Assessment and Management, which is based on a two-step (area-basis and tree-basis) assessment to professionally and systematically identify and mitigate tree risks. Before the onset of the wet season every year, tree management departments are required to complete Tree Risk Assessments (TRAs) and implement necessary mitigation measures, such as removal of dead branches, pruning, pest and disease control, etc., in areas with high pedestrian and vehicular flows to reduce the risk of tree failure and protect public safety.

15. In 2015, the Government updated this Panel on the enhanced TRAM covering the introduction of the triage system, along with the inclusion of reference notes and checklists to better facilitate management, monitoring and maintenance. The triage system is now in use to identify trees in need of priority care. Taking the 2017 TRAM exercise for illustration, about 940 000 urban trees were assessed through tree group inspection, of which approximately 8 700 trees required detailed individual TRAs. About 12 000 mitigation measures were carried out by the tree management departments.

Dedicated Regime for High-Risk Trees

16. High risk trees are those with incurable health conditions, structural defects, of problematic root anchorage and stability, or in senescent age. These trees are inspected twice a year to safeguard public safety.

Brown Root Rot (BRR) Disease

17. BRR disease is a highly infectious disease that can seriously affect tree health but without any known cure so far. The GLTMS adopts preventive and management tactics to safeguard our urban forest assets from BRR disease. Working with relevant members of the UFAP and their extended network of expertise in BRR disease, the GLTMS is developing a Brown Root Rot Disease Operations Manual ("the Manual")[2] to deliver a step-by-step guide to managers, supervisors and frontline staff in the safe removal and disposal of BRR infected trees and debris. An education video is also being produced to supplement the Manual. Education and awareness amongst tree management departments have improved and cases have been reported in a timely manner. In 2016 and 2017, 154 and 135 BRR-infected trees were reported for removal respectively.

Stonewall Trees (SWTs)

18. Stone walls in Hong Kong were not designed to grow trees. As such, trees growing on stone walls require bi-annual TRAs and additional management. In 2013, the GLTMS promulgated the "Management Guidelines for Stonewall Trees" for tree management departments to maintain the health and structure of SWTs, with a view to minimising the risk of failure.

19. In 2015, the TRAM was revamped to include different types of SWTs and potential failure risk assessment. We have undertaken a number of geotechnical and arboricultural studies to examine the root anchorage and stability of SWTs with a view to understanding their structural and bio-mechanical behaviours and their interaction with stonewalls. We are currently piloting with a smart sensor technology on SWTs to detect potential displacement of the trunk and decline in yield capacity (paragraph 34 below refers).

Old and Valuable Trees (OVTs) and Trees in Unfavourable Conditions

20. The risk of trees is attributed to a number of interdependent factors such as weather, tree health, age and growing environment. Since many OVTs are in mature or even senescence stages, these trees are given close attention. Tree management departments have to undertake detailed TRAs for OVTs every six

[2] The Brown Root Rot Disease Operations Manual will be piloted in the 2018 wet season for further refinements to develop a new protocol to limit the spread of BRR disease.

months to review and assess tree health and structural conditions.

21. For trees growing in restricted environments, such as trees planted in pots or trees with high risk of failure, departments have implemented necessary mitigation measures, such as crown pruning and removal of dead branches in a timely manner to ensure their healthy growth and protect public safety.

Promoting Proper Tree Care on Private Properties

22. The GLTMS reminds property managers and private property owners before the wet season to undertake TRAs for the trees in their properties and carry out timely mitigation works, with the assistance of qualified arborists as necessary. To provide guidelines and standards of tree management, the GLTMS promulgated the Handbook on Tree Management (the Handbook) in April 2016. The Handbook will be incorporated into the Home Affairs Department's Code of Practice under section 44 of the Building Management Ordinance (Cap. 344) by mid-2018.

23. In support of property managers and private property owners in this respect, the GLTMS organises seminars and field demonstrations to explain the key points of tree care work and the proper ways to conduct TRAs. Between 2016 and 2017, 13 onsite TRA demonstrations and seminars were organised, with 500 participants. In January and February 2018, the GLTMS briefed private property owners and managers on the responsibility and essentials of tree management in three workshops on building management organised by the Home Affairs Department covering Hong Kong Island, Kowloon and the New Territories. The GLTMS will continue to organise training courses and sharing sessions for private property managers, property owners, and general workers to strengthen their awareness and knowledge on proper tree care.

Capacity Building in the Workforce

24. We work closely with the arboriculture industry, which is in high demand but still evolving, to develop a quality workforce. In 2016, the GLTMS in collaboration with the Qualifications Framework Secretariat of the Education Bureau established the Arboriculture and Horticulture Industry Training Advisory Committee to uplift and standardise the training and operation of the industry, and to enhance the professional standing and career prospects of practitioners in the long run. At present, the priority task is to develop the set of Specification of Competency Standards (SCS) for the industry.

The SCS will set out the skills, knowledge and outcome standards required for practitioners to effectively perform various tasks of different complexity. Training courses developed and accredited with reference to the SCS will be recognised under the Qualifications Framework.

25. The GLTMS also facilitated the formation of the Horticultural and Arboricultural Trade Confederation, which represents industry professional bodies, associations and labour unions to streamline communication, support the roll-out of the SCS, and develop a common code of conduct, with a view to promoting safety awareness in frontline operations and practices, upholding quality standards and encouraging continuous professional development. This will form the basis for the industry to explore the merit and feasibility of various regulatory options, including legislation, self-regulation etc.

26. To nurture a professional workforce capable of providing quality knowledge in tree asset management, the GLTMS has been arranging a variety of training programmes, including tree asset management courses, talks, and seminars for tree management staff at managerial, supervisory and frontline levels to raise their professional knowledge in urban arboriculture. In 2017, the GLTMS co-organised with the Chinese University of Hong Kong the "Symposium on Brown Root Rot Disease Management", and organised the first "Urban Forestry Forum 2017". Members of the UFAP have also conducted seminars targeting supervisory and frontline staff on BRR disease, pest and disease, and tree risk assessment and management.

27. Apart from organising training and seminars for staff within the Government and the private sector, the GLTMS has strengthened collaboration with education and training institutions to uplift the quality of the training courses and to ensure continuous enhancement, thus improving the professional workforce in the tree management industry.

Community Education and Involvement

28. To raise public awareness and foster a culture of tree care, the GLTMS organises promotional and educational activities for the public and the industry. In 2017, the GLTMS organised school talks, public seminars, and a roving exhibition on various tree management topics, which attracted over 5 640 participants. In 2018, a training programme for private property owners and property managers to enhance their knowledge on tree asset management, in

particular regular care and maintenance, identification of tree risks and proper risk mitigation arrangements through seminar and field demonstration will be implemented. The GLTMS will continue to collaborate with key industry sectors to promote the horticulture and arboriculture industries as well as the professionalism and image of the industry.

WAY FORWARD

Proper Landscape Practices

29. Following the development of the tree selection guide (paragraphs 11 refers), we will prepare another guide to put into practice the integrated life-cycle planning, design, implementation and management practices to optimise street planting and achieve a healthy and resilient streetscape.

30. From the experience gained from the Rain Garden at Wylie Road (paragraph 10 refers), we will promote the concept of permeable and functional urban landscape, and explore adopting water sensitive design into infrastructure works in new development and upgrading projects.

TRAM Enhancement

31. In 2017, the GLTMS started a comprehensive review on the TRAM regime to optimise the TRA workflow for handling the urban trees according to priorities and enhance the criteria to align with the latest international standards and practices. The major enhancement measures cover areas such as the identification of mature trees in poor growing conditions for TRAs, inclusion of residual tree risk after completion of mitigation measures, and qualification and experience requirements of inspection officers for TRAs. We aim at rolling out the enhanced TRAM progressively starting from 2019.

Wider Use of Technology

32. The GLTMS has been working with our UFAP members and their extended network to explore a more systematic and analytical framework to better coordinate, assess and manage our tree assets. This includes the adoption of technologies to support and enhance the TRA to safeguard tree health and public safety.

Remote Sensing Multispectral Imagery

33. The Government has embarked on a study to explore the use of fixed-wing aircraft remote sensing to monitor tree health conditions and pathogen infection. The study, which commenced in September 2017, collects multispectral imagery to track changes in tree health over time. The data can show declines in tree health from previous mapping exercises. The study is due for completion in October 2018. A review will be undertaken to determine its effectiveness in identifying trees in need of priority care.

Smart Sensing Technology on Urban Trees

34. With the support of the Hong Kong Jockey Club, the GLTMS is undertaking a collaborative project with local tertiary institutions to install sensors on nine high-risk tree species[3] and SWTs to detect tree stability and anchorage, especially decline in the yield capacity, i.e. the ability of the tree to recover from wind and rain. The sensors will be linked to an alert that will highlight trees with a higher probability to fail in severe weather. Depending on the results of the trial project, it can be used as a real-time tree management platform to protect public safety.

Tree Information Management

35. To provide a centralised platform for all tree inventory data, the GLTMS maintains a Tree Management Information System (TMIS) to capture relevant information on trees such as species, size, location and TRA records under the care of different tree management departments. Information in the TMIS can be accessed and shared across tree management departments.

36. To cater for the growing tree inventory and to provide spatial and risk analysis, the Government plans to upgrade the TMIS into a Tree Risk and Asset Information Platform (TRAIP), which will provide tree inventory and aggregate tree information from various sources including inspections and data gauged by sensors to improve tree management.

[3] The species are Chinese Hackberry, Horsetail Tree, *Bauhinia* spp., Kassod Tree, Lemon-scented Gum, Candlenut Tree Sea Hibiscus, Flame Tree and Coral Tree. These species have been recorded as high failure cases, with some known as brittle species.

Capacity Building

37. The GLTMS will continue its work with the horticulture and arboriculture industry, along with key stakeholders and green groups to continually build knowledge and capacity in all aspects of urban forestry to uplift urban vegetation health, and tree asset management to continually improve proper tree care. Training will also be expanded on proper landscape practices to instil a broader knowledge of favourable landscape environments to maximise tree and vegetation health. The GLTMS will also continue to offer seminars to higher education students from landscape architecture, architecture, and units within geography to engage our youth in the development of resilient and healthy landscapes.

Strengthening Coordination

38. The wet season and in particular the period after significant storm events including typhoons are particularly busy times for tree management departments. As part of the follow-up works during wet season, the GLTMS reminds tree management departments to expedite mitigation and clean-up works after storm events including typhoons. In the light of the experience of strong typhoons such as “Hato”, we will strengthen departmental coordination in addressing community reports on tree incidents and expediting clean-up works in a safe and timely manner.

Timely Community Involvement

39. As living organisms with a finite life-cycle, trees will invariably require removal. This process also allows opportunities to regenerate and replenish our urban forest to be more resilient and adaptive to changing climate and landscape settings. We understand that some trees are of particular interest to the public and often draw intense public attention. When such trees decline or pose imminent danger to life and property, it is prudent to remove the threat without delay to ensure public safety. Tree management departments are required to undertake a sensitivity analysis and to properly inform the affected community members of the assessment findings and seek a common understanding to bring about a dignified conclusion to the tree’s life. We will formalise the protocol for handling complex cases with public concern through proper analysis and community involvement.

ADVICE SOUGHT

40. Members are invited to note and comment on the landscape and tree management work in Hong Kong.

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Annex A

Terms of Reference of
The Community Involvement Committee on Greening (CICG)

The CICG advises on measures to encourage quality greening and to nurture a culture of tree care through public education and community involvement activities, including:

- to work with public, private and community organisations to identify greening opportunities;

- to advise on measures to encourage greening, quality landscape design and quality tree management, particularly in the built-up areas and in private sector developments for consideration by the Steering Committee on Greening, Landscape and Tree Management;

- to formulate public education programmes to foster an attitude of care for trees and the greened environment in the community;

- to advise on the manpower development strategy, including provision of education and training, with a view to building up the capacity of the industry to undertake greening, landscape and tree management works; and

- to enlist community support for greening through civic education and campaign.

Annex B

Terms of Reference of the Urban Forestry Advisory Panel (UFAP)

The UFAP advises the Greening, Landscape and Tree Management Section of the Development Bureau on the following matters:

- strategies in relation to urban forestry, encompassing urban arboriculture, urban ecology and urban landscapes;

- urban forestry applied research and development regime within practical and measurable framework; and

- policies and measures concerning the promotion of positive capacity building on the urban forestry related industries and trades.