Contents

Section  Title

Foreword

Structure of this Guide

Glossary of Abbreviations

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INTRODUCTION 8</td>
<td>8</td>
</tr>
<tr>
<td>1.1 Overview 8</td>
<td>8</td>
</tr>
<tr>
<td>1.2 Objective of the Guide 8</td>
<td>9</td>
</tr>
<tr>
<td>1.3 What is Street Ecology? 9</td>
<td>9</td>
</tr>
<tr>
<td>1.4 What is Urban Forestry? 9</td>
<td>9</td>
</tr>
<tr>
<td>1.5 Benefits of Urban Forest 9</td>
<td>9</td>
</tr>
<tr>
<td>1.6 Why is Biodiversity Important? 10</td>
<td>10</td>
</tr>
<tr>
<td>1.7 An Overview of Existing Standards and Guidelines 10</td>
<td>10</td>
</tr>
<tr>
<td>2. CHALLENGES AND OPPORTUNITIES 13</td>
<td>13</td>
</tr>
<tr>
<td>2.1 Challenges 13</td>
<td>13</td>
</tr>
<tr>
<td>2.2 Opportunities for Hong Kong 19</td>
<td>19</td>
</tr>
<tr>
<td>3. PRINCIPLES AND STRATEGIES 20</td>
<td>20</td>
</tr>
<tr>
<td>3.1 Principles and Strategies 20</td>
<td>20</td>
</tr>
<tr>
<td>4. RIGHT TREE 23</td>
<td>23</td>
</tr>
<tr>
<td>4.1 Roadside Urban Forest Today 23</td>
<td>23</td>
</tr>
<tr>
<td>4.2 Limitation of Research Information 28</td>
<td>28</td>
</tr>
<tr>
<td>4.3 Approach to the Guide 28</td>
<td>28</td>
</tr>
<tr>
<td>4.4 Street Tree Selection Criteria – Essential Attributes 30</td>
<td>30</td>
</tr>
<tr>
<td>4.5 Street Tree Selection Criteria – Valued Attributes 32</td>
<td>32</td>
</tr>
<tr>
<td>5. RIGHT PLACE 35</td>
<td>35</td>
</tr>
<tr>
<td>5.1 Introduction 35</td>
<td>35</td>
</tr>
<tr>
<td>5.2 Review of Existing Roadside Tree Planting Standards Requirements &amp; Guidelines 35</td>
<td>35</td>
</tr>
<tr>
<td>5.3 Methodology 38</td>
<td>38</td>
</tr>
<tr>
<td>5.4 Spatial Requirements for Tree Planting 39</td>
<td>39</td>
</tr>
<tr>
<td>5.5 Road Hierarchy 40</td>
<td>40</td>
</tr>
<tr>
<td>5.6 Spatial Characteristics and Surrounding Street Environments 41</td>
<td>41</td>
</tr>
<tr>
<td>6. FOR US 45</td>
<td>45</td>
</tr>
<tr>
<td>6.1 Introduction 45</td>
<td>45</td>
</tr>
<tr>
<td>6.2 Liveable City 45</td>
<td>45</td>
</tr>
<tr>
<td>6.3 Site Specific Criteria 46</td>
<td>46</td>
</tr>
</tbody>
</table>
7. **STREET TREE SELECTION**
   7.1 The Selection Process .................................................. 48
   7.2 The Shortlisted Species .................................................. 48

8. **LIFE-CYCLE MAINTENANCE AND MANAGEMENT OF TREES**
   8.1 Introduction ..................................................................... 63
   8.2 4 Stages of the Tree Life-cycle ........................................... 63
   8.3 M&M Operations in 4 Stages of the Life-cycle ......................... 64

9. **COMPLEMENTARY VEGETATION COMMUNITY MIX**
   9.1 Layers of Vegetation ....................................................... 78
   9.2 Urban Ecology ................................................................. 79
   9.3 Benefits of CVCM ............................................................. 80
   9.4 Selection Principles and Considerations ............................... 80

10. **CONCLUSION** ................................................................. 87

**REFERENCES** ................................................................... 89

**APPENDICES**

**APPENDIX A** Tree Datasheets

**APPENDIX B** Tree Selection Criteria Rating

**APPENDIX C** Maintenance Requirements at Different Phases of Trees’ Life-cycle

**APPENDIX D** Suitable Tree Species for each Street Typology

**APPENDIX E** Recommended List of Complementary Vegetation Community Mix
Foreword

The Greening, Landscape, and Tree Management Section (GLTMS) in the Development Bureau (DEVB) of the HKSAR commissioned a Consultancy Study to rationalise and guide the selection of street trees in Hong Kong. The purpose is to improve the resilience of the Territory's urban forest by maximising species diversity under the principle of “Right Tree, Right Place” to improve ecological health upstream and in turn, minimise tree risks downstream.

A number of trees planted in the past might have been suitable for a particular location at that time. Some trees, such as afforestation pioneer planting on slopes, have out-grown their compact urban environment or are reaching the end of their life-cycle and are no longer appropriate. As trees are gradually due for replacement, it presents opportunities for the adoption of sustainable landscape strategies and practices. The result is the Street Ecology Strategy for Hong Kong (the Study). It aims to provides a strategic framework for sustainable long-term management of our street trees in a holistic manner, and forms part of government’s overall efforts in supporting the Hong Kong Biodiversity Strategy and Action Plan (BSAP), the Hong Kong’s Climate Action Plan 2030+ (CAP) and the Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030 (Hong Kong 2030+). The Study includes a Street Tree Selection Guide (the Guide). It is a practical reference tool to assist designers in selecting tree species suitable for different common streetscape typologies in the urban area of Hong Kong.

This Study provides an analysis and evaluation of the current urban Hong Kong streetscape conditions and recommends a more diverse tree species list for different street types. Methods of analysis include the overview of existing guidelines and ordinances, site observations, local experiences and valuable inputs from the landscape and arboriculture industry, relevant government departments and related disciplines.

The Study has found that the current Hong Kong roadside urban forest is dominated by a small range of 20 common tree species in large quantity and planted en-masse. Such homogenous planting or monoculture reduces plant diversity and make our urban forest more vulnerable to outbreaks of pests and diseases, and diminished soil quality. In response, 80 less commonly used but suitable tree species are recommended in the Guide to support a long term sustainable, healthy and resilient urban forest. Due to the scope and limitation of the Study, users are welcome to select other tree species not shortlisted using the same principles and methodology including the 20 common tree species, which are not in the Guide due to its abundance in stock. These commonly used species are however not encouraged to be widely planted as previously practised, to improve the vegetation diversity of our future urban forest.

The Guide is written for consultants, government works departments, professionals and practitioners, involved in street trees replacement and planting. To achieve a healthy and resilient urban forest, it recommends making reference to the 10-20-30 basic rule of plant diversity as a start, i.e. no more than 10% of any one species, 20% of any one genus and 30% of any one family. As roadside planting environment can be very different due to site specific landscape conditions such as narrow footpaths, underground utilities, microclimate, minimal air movement, etc., the Guide is not meant to be prescriptive. Professional advice from Landscape Architects and other relevant disciplines should be sought during the planning and design stages to ensure the overall street landscape as well as other supporting elements such as complementary vegetation community mixes (CVCM), tree pit details, structural soils or cells, drainage, below-ground infrastructure, etc. are duly taken into consideration.

---
1 For the purpose of this Study, urban area means built-up areas within the Hong Kong Island, Kowloon and the New Territories.
2 Expressways, highways and trunk roads were excluded in the analysis as both are considered to have very specific requirements to be studied separately.
The health of trees and vegetation starts with a favourable landscape from the outset to facilitate their subsequent maintenance. Designers and departments are encouraged to widely apply the Guide in the replacement and new street tree planting projects. With more practical applications of the shortlisted species, more experience can be developed to review and update the Guide. Users are encouraged to provide comments to the GLTMS so that continual improvements can be made for the future of our urban ecology.
Street Tree Selection Guide

Structure of this Guide

The information in the below sections are structured to facilitate clear decision making for selecting suitable tree species under the principle of “Right Tree, Right Place”.

Section 1 – Introduction
The introduction outlines main purpose of the report and its relationship with the Hong Kong Climate Action Plan 2030+ (CAP), Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030 (Hong Kong 2030+) and the Hong Kong Biodiversity Strategy and Action Plan (BSAP). It summarises the current roadside urban forest of Hong Kong today.

Section 2 – Challenges and Opportunities
This section summarises the key issues roadside tree planting in Hong Kong are facing both today and in the future.

Section 3 – Principles and Strategies
This section lays out the 3 basic principles and its strategies for selecting suitable tree species for Hong Kong urban streets.

Section 4 – Right Tree
This section identifies the process for selecting suitable roadside tree species for Hong Kong.

Section 5 – Right Place
This section identifies the typical street conditions for growing urban street trees in different street typologies and the process of analysing the suitability for tree planting within the street.

Section 6 – For Us
This section identifies the general tree selection considerations based on the community and people needs and desires. Examples of selection criteria to address community and people needs are given.

Section 7 – Street Tree Selection
This section lays out the different methods in selecting suitable tree species for different street typologies.

Section 8 - Life-cycle Maintenance and Management of Trees
This section gives a summary of general maintenance operations and requirements at each stage of the life-cycle of street trees.

Section 9 – Complementary Vegetation Community Mix (CVCM)
This section highlights the basic principles and strategies for selecting a complementary understorey planting to form a complete street ecology.

Section 10 – Conclusion
This section recommends actions for the next stage.

Appendix A to C provides the general tree species information, rating and life-cycle management for the 80 shortlisted tree species. This section is intended to be a ‘living document’ with the ability to be updated as more data, information and research become available.

Appendix D provides a summary for tree species recommended for each street sub-type. This section is intended to be a ‘living document’ with the ability to be updated as more data, information and research become available.
Appendix E provides examples of CVCM that can be used in urban streets. Professional advice from Landscape Architects is recommended for proper street planting planning and design in selecting the appropriate CVCM for the selected tree species.
Street Tree Selection Guide

### Glossary of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFCD</td>
<td>Agriculture, Fisheries and Conservation Department</td>
</tr>
<tr>
<td>ArchSD</td>
<td>Architectural Services Department</td>
</tr>
<tr>
<td>BSAP</td>
<td>Hong Kong Biodiversity and Strategy Action Plan 2016-2021</td>
</tr>
<tr>
<td>CAP</td>
<td>Hong Kong Climate Action Plan 2030+</td>
</tr>
<tr>
<td>CEDD</td>
<td>Civil Engineering and Development Department</td>
</tr>
<tr>
<td>CMGZ</td>
<td>Central Median Greening Zone</td>
</tr>
<tr>
<td>CVCM</td>
<td>Complementary Vegetation Community Mix</td>
</tr>
<tr>
<td>DBH</td>
<td>Diameter at Breast Height</td>
</tr>
<tr>
<td>DEVB</td>
<td>Development Bureau</td>
</tr>
<tr>
<td>DSD</td>
<td>Drainage Services Department</td>
</tr>
<tr>
<td>GLTMS</td>
<td>Greening, Landscape, Tree Management Section</td>
</tr>
<tr>
<td>GMP</td>
<td>Greening Master Plan</td>
</tr>
<tr>
<td>HD</td>
<td>Housing Department</td>
</tr>
<tr>
<td>HKO</td>
<td>Hong Kong Observatory</td>
</tr>
<tr>
<td>Hong Kong 2030+</td>
<td>Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030</td>
</tr>
<tr>
<td>HKPSG</td>
<td>Hong Kong Planning Standards and Guidelines</td>
</tr>
<tr>
<td>HyD</td>
<td>Highways Department</td>
</tr>
<tr>
<td>LCSD</td>
<td>Leisure and Cultural Services Department</td>
</tr>
<tr>
<td>RVGZ</td>
<td>Roadside Verge Greening Zone</td>
</tr>
<tr>
<td>UHI</td>
<td>Urban Heat Island Effect</td>
</tr>
<tr>
<td>ULE</td>
<td>Useful Life Expectancy</td>
</tr>
<tr>
<td>TMIS</td>
<td>Tree Management Information System</td>
</tr>
<tr>
<td>TPDM</td>
<td>Transport Planning and Design Manual</td>
</tr>
<tr>
<td>WSD</td>
<td>Water Supplies Department</td>
</tr>
</tbody>
</table>
1. Introduction

1.1 Overview

The Paris Agreement came into force on 4 November 2016. The Agreement calls for global actions to keep global average temperature increase below 2°C and achieve a balance between carbon sinks and sources within the second half of the 21st century. Hong Kong Climate Action Plan 2030+ (CAP) outlines the action plan for Hong Kong to achieve the targets set out in the Paris Agreement. One of the ways to achieve this is through the planning, creation and improvement of urban forests, green and blue spaces to enhance Hong Kong’s overall liveability, biodiversity and climate-readiness. Moreover, the Hong Kong Biodiversity and Strategy Action Plan 2016-2021 (BSAP), states that urban forests can serve as important ecological linkages with the countryside and encourage the movement of wildlife. To accomplish this, the following specific actions are recommended in BSAP and relevant to this Guide:

- Formulate an urban forestry strategy that contributes to a sustainable urban landscape, and promote the appreciation of urban biodiversity;
- Promote diversification of soft landscapes and optimise use of native species for enriching urban biodiversity; and
- Recognize the importance of street trees in urban forestry.

In addition, the Hong Kong 2030+ advocates to uplift liveability in Hong Kong by enhancing green and blue space and bringing nature to the increasingly compact city. Under this initiative, the Hong Kong 2030+ seeks to provide a conducive environment for biodiversity to thrive.

The purpose of this Guide is to aid in selecting urban street trees suitable for common road hierarchies in Hong Kong to facilitate tree replacement or new tree planting. It is intended to support strategic street tree planning, urban forest strategy and management and promoting a sustainable built environment as recommended in the CAP, BSAP and Hong Kong 2030+.

1.2 Objective of the Guide

The objective of the Guide is to provide a practical guide to facilitate tree selection for different street typologies of Hong Kong.

The processes involved are summarised below:

- Establish criteria for selecting tree species for common street typologies in Hong Kong based on the principle of “Right Tree, Right Place” and the life-cycle planning of street trees.
- Shortlist suitable tree species based on the above principles.
- Recommend suitable tree species and complementary vegetation community mixes (CVCM) for common street typologies to achieve a sustainable, healthy and resilient urban forest and minimise risk.

---

of tree failure or premature decline (tree losing vigour before its expected time for its species). CVCM refers to the vegetation underneath the tree canopy, it will be discussed further in Section 9.

A set of tree datasheets together with the tree selection criteria rating (Appendix A-D) are developed to aid the process of tree selection for Hong Kong streets. It is intended to be a living document with the ability to be updated as more information, data and research is available.

It should be noted that tree species selection should not be restricted to those given in Appendix A to C as due to the limitations of this Study, only 80 species were selected as an example. Under the “Right Tree, Right Place” principle, other suitable tree species can be selected using the same methodology proposed in this Guide.

1.3 What is Street Ecology?

“A space of dynamic relationship that results from the complex web of interconnected activities and phenomena...a place that thrives on the co-existence of diverse people, activities, forms and objects and modes of control and negotiation, as it operates as a social, cultural, economic and political space. As a corollary, this also means not thinking the street as a complete and stable state of equilibrium but recognizing the street as a place in flux with some level of conflict.” -- Vikas Mehta 7

By definition, street ecology is applying the concept of ecology to the street context. For this Guide, it is the investigation of the relationships and interactions between a street and its immediate environs (carriageway, through-zone, parking spaces, bus stops, surrounding buildings and landscaped area), planting (trees and shrubs) and its users (people and urban wildlife).

1.4 What is Urban Forestry?

Urban forestry is a city wide, integrated, inter-disciplinary approach combining strategic planning and multi-managerial practices to improve the social, environmental and economic benefits to public through a sustainable long-term management of urban vegetation. The term ‘urban’ refers to the dense, built-up areas of the city. As recognized in CAP and Hong Kong 2030+, it is important for different government departments to work together to develop an urban forestry strategy as well as good management practices which are essential to achieve healthy urban forests and enhance Hong Kong’s overall liveability, biodiversity and climate-readiness.

1.5 Benefits of Urban Forest

For this Guide, the main focus will be on street trees. Urban street trees are a major component of a city urban forest. They can provide a range of social, environmental and economic benefits that are often unnoticed and underappreciated. Understanding the benefits of urban street trees aid in making the right decisions in selecting and managing street trees. Possible benefits are summarised in Figure 1.1.

1.6 Why is Biodiversity Important?

One of the important components to create and maintain a healthy and sustainable urban forest is to maintain biodiversity. Biodiversity is defined as the variety of living organisms in a habitat. A high level of biodiversity is desirable because it boosts ecosystem productivity, sustainability, climate resilience, urban forest benefits and urban forest health. Some species may be better at providing specific urban forest benefits due to intrinsic (morphological and physiological) and temporal (seasonal) characteristics. Thus, to optimise the multiple benefits of the urban forests, it is essential to have vegetation diversity. A broader diversity of urban trees can guard against the risk of large-scale devastation by pests and large-scale replacements due to ageing or environmental changes.

To achieve a resilient urban forest, Dr. Frank Santamour, a Research Geneticist at the US National Arboretum, had recommended in his paper that urban tree planning should follow the 10-20-30 rule for planting diversity. The rule of thumb suggests an urban tree population should include no more than 10% of any one species, 20% of any one genus, and 30% of any family. Following this rule can result in a more biologically diverse planting. 8

1.7 An Overview of Existing Standards and Guidelines

As mentioned previously, street ecology studies the relationship and interactions between the street environs, planting and its users. In Hong Kong, the existing standards and guidelines related to the spatial consideration requirements for a safe, functional and comfortable street environs are listed below.

Street Tree Planting Spatial Consideration Requirements


Accordingly, planting, maintenance and user requirements can be broadly summarised in the existing standards, guidelines, specification and relevant studies listed below.

Street Tree Selection Guide

Landscape Planting and Maintenance Work Requirements


Based on these existing standards, guidelines and specification, key considerations relevant to roadside tree planting and maintenance works are summarised in *Figure 5-1* and *Figure 5-2*.
Figure 1-1 – Benefits of Urban Forest

- Combat urban heat island effect
- Increase economic value of properties
- Captures harmful air pollutants, particulate matter and dust
- Provides ecological linkages with natural habitats and encourages movement of wildlife among different parts of the territory
- Provides a safety buffer
- Provides a habitat and enhance biodiversity
- Provides a human scale open space
- Provides seasonal interest
- Provides shade
- Encourages outdoor activity
- Sequester & store carbon
- Calming traffic, slowing speeds
- Reduces the flow of stormwater, intercepting & reducing rainfall and runoff
2. Challenges and Opportunities

2.1 Challenges

This Section seeks to tackle the key challenges encountered in the existing and future roadside urban forest of Hong Kong to achieve a self-sustainable, resilient urban streetscape design as part of the initiatives set out in CAP. Many of these challenges are shaped from the harsh urban environment. These include, but not limited to microclimate, soil conditions, overhead and underground space, social and functional uses and surrounding land uses. Other challenges arise from past planting practices, lack of knowledge on proper planting and maintenance, limited available data and experience. Listed below are the most common challenges currently faced in Hong Kong.

Declining Vegetation Diversity

Biodiversity refers to the variety and abundance of living species within the ecosystem. It can be simply partitioned into 2 components – species richness (the abundance of species) and species evenness (variety of species).  

From the recent data gathered, it was discovered that our roadside urban forest scored high in species richness but low in species evenness. (Refer to Section 4) This is mainly due to the planting practices in the past, where there was an over-reliance on a limited variety of species, of which many were exotic species. One of the risks of homogenous planting practice is that any pest or disease affecting a single tree species may cause a domino effect of dying or diseased trees for multiple streets or districts.

As discovered from the desktop research, much of the original vegetation in Hong Kong was removed to make way for rapid urbanisation, particularly in the new towns. In the older districts, carriageways and pedestrian footpath widths were kept to the minimum to maximise space for the increasing population. This inherited shortage of large planting spaces has led to general a lack of large-size trees that could have been planted on urban streets. Also, existing large trees in the urban streets are often seen growing in unfavourable conditions.

These issues lead to stressful growing environment for street trees, resulting in reduced Useful Life Expectancy (ULE) for street tree species and the gradual decline in vegetation diversity in Hong Kong. If the situation continues, this may further lead to a decrease in their pest and disease resilience and adaptability.

Diversifying the vegetation mixes in our roadside urban forests will improve the soil condition, plant health and their immunity to pests and diseases, and hence the subsequent maintenance efforts. A healthy roadside urban forest can also enhance biodiversity through generation of healthy urban ecosystems. Moreover, roadside urban forests with age diversity have shown that they can support a wide range of urban wildlife, including rare or endangered species. By having varying tree life spans and growth rates within the urban forest, it ensures that trees within the streetscape will not decline or need to be replaced all at the same time, thus reducing possible visual impact.

Ageing Tree Population

An ageing or senescent tree is a tree that is near the end of its ULE. Different from the concept of life-cycle which stands for a measure of the biological life of the tree, ULE is an estimate of how long a tree is likely to contribute and remain in the landscape based on health, amenity and environmental services, cultural contributions and risks to the community. When the maintenance cost of a tree outweighs its contributions and benefits, it is deemed to be the ideal time that the tree should be replaced.

An ageing tree is more vulnerable to diseases, pests and other environmental factors before their inevitable decline. Due to the stressful urban environment, many urban trees reach the end of their ULE faster than those planted in their natural environment or a park. Many roadside trees in Hong Kong’s urban areas are reaching the end of their ULE, in particular those planted in the early-1900s and the fast-growing pioneer tree species, such as *Acacia confusa*, planted for the purpose of reforestation in the late-1900s and early development of new towns. Timely replacement is critical to reduce tree failure risk in high trafficked areas, ensure slope stability, maintain tree canopy cover and streetscape design intent. Streets that are symmetrical avenues need to be carefully managed to ensure visual consistency and community consensus are achieved for the replacement planting.

Replacing trees reaching the end of the ULE requires good urban forestry management and practices. An appropriate replacement plan, community collaboration and a comprehensive management and monitoring program are essential to set out the framework for urban street tree replacement and planting.

Urban Heat Island

Urban heat island (UHI) effect occur in areas where there is lack of shade and vegetation cover causing increased heat retention and absorption by paved surfaces, buildings and roads. In Hong Kong, the UHI effect is primarily a night-time phenomenon, where the high heat capacity in the urban area reduces heat release back to higher atmosphere at night. Taller buildings also minimise wind speed and evaporation, which further inhibits cooling. Thus, larger nocturnal cooling rate can indicate a lower UHI effect.

From a study conducted by Hong Kong Observatory (HKO) in 2010, the urban-rural temperature difference or UHI intensity in the urban centre of Hong Kong can be more than 10°C. In general, urban areas are observed to have higher UHI with a noticeably smaller nocturnal cooling rate in summer. On the other hand, the rural areas have a higher nocturnal cooling rate and daytime warming rate (Figure 2-1).

Elevated temperatures resulting from UHI can affect a community’s environment and quality of life. Some of these impacts are:

- Increased energy consumption – With the decreased nocturnal cooling rate resulting in hot nights, an increased overall electricity demand for air-conditioning and other cooling methods.

---

Street Tree Selection Guide

- Increased air pollutants and greenhouse gases – Due to increased energy consumption, there is a greater demand for fossil fuel power plants which leads to increased air pollutants and greenhouse gas emissions. Additionally, some of these pollutants are temperature dependent and tends to form faster under warmer temperature, such as NOx and volatile organic compounds.

- Decreased human health and comfort – The elevated temperatures and increased air pollutants can cause general discomfort, respiratory difficulties, heat cramps, exhaustion, heat strokes and heat-related premature deaths.

Urban forests can become a key factor in combating UHI. Evapotranspiration and shade created from urban forests can cool the air to as much as 1°C to 5°C and reduce the production of temperature dependent pollutants.\textsuperscript{12} Trees providing shade can contribute to regulate temperature extremes, and improve human health and comfort.

\textbf{Figure 2-1 Urban Heat Island (UHI) in terms of Cooling Rate (CR). The CR of rural areas is higher than that of urban areas in general.}\textsuperscript{3}

\textbf{Climate Change}

"Future proofing is about utilising and developing the capabilities of cities to respond to the risks associated with climate change, resource scarcities and damage to ecosystems in a way that catalyses inclusive urban development." – Future Proofing Cities \textsuperscript{13}

Local climate extremes and UHI, both shown in studies conducted by HKO, are worsening. The frequency of temperature extremes, such as high hourly rainfall, hot days and nights, and extreme precipitation, has been increasing over the last hundred years. The annual number of hot nights

\textsuperscript{12} Kurn, D. M., Breitz, S. E., Huang, B., & Akbari, H. (1994). The potential for reducing urban air temperatures and energy consumption through vegetative cooling (No. LBL–35320), Lawrence Berkeley Lab., CA (United States).

(days with minimum temperature of 28°C or above) has increased by twenty times and the annual number of cold days has decreased by 45% since the last 100 years. Extreme precipitation has become more frequent, with the hourly rainfall records increasing more than 60%, breaking past rainfall records at an unprecedented rate. HKO projected that the temperature and weather extremes will continue to rise due to global warming (refer to Figure 2-2). Therefore, developing a long-term planting strategy will better equip Hong Kong to cater and withstand future local climate extremes.

It is also important to understand the future trends in climate change and how these might affect the future growth of the trees. As part of the planning strategy for Hong Kong’s long-term vision of a sustainable and resilient landscape, tree species should be selected with due consideration to climate resilience.

Under the “Right Tree, Right Place” principle, we will not only need to select trees that can thrive in the existing Hong Kong climate, but also in the expected changes in future weather patterns until the end of its ULE.

MORE EXTREME WEATHER IN HONG KONG

FREQUENT HEAT WAVES
According to Hong Kong Observatory's records, the annual number of hot nights during 1986-2015 has increased 20 times than 1885-1914. It is certain that very hot days will occur more frequently.

MORE INTENSE TYPHOONS
A greater number of intense typhoons will be seen which may pose increased humanitarian risks and damage economies. Also, serious flooding may become a recurrent event.

SEA LEVEL RISE
At the end of this century, the sea level of Hong Kong is likely to rise up to 1.07m under high greenhouse gas scenario. This may cause serious flooding in low-lying areas.

HEAVY PRECIPITATION
Under high greenhouse gas scenario, the number of extremely wet years is expected to increase from 3 to 12 by the end of the 21st century. Landslides triggered by heavy precipitation may occur with higher frequency.

Figure 2-2 – More Extreme Weather in Hong Kong
Community Concerns

Most Hong Kong citizens like trees. On the other hand, they have some reservations or concerns of varying degrees in particular trees planted in urban street environs. These concerns include:

- Trees attract animals, causing nuisances like droppings and possible diseases passed from birds
- Trees cause a mess by dropping leaves, flowers or fruit
- Trees may block views
- Trees attract unwanted insects, such as mosquitoes
- Trees block footpaths and cause paving upheaval
- Trees may be dangerous

Currently, the government is educating the community on the benefits of trees and proper tree planting, maintenance and management procedures, through talks, exhibitions and advertising to ease most of the public’s concern. However, it is equally important for the community to realise that trees are living organisms and eventually do age, die and need to be replaced. With appropriate life-cycle planning and planting under the principle of “Right Tree, Right Place”, accompanied by proper urban forestry management and practices, it is possible to maximise a tree’s ULE.

Spatial Constraints

According to the research conducted by The Centre for Urban Forest Research (2004), large trees have more positive impacts on urban ecology and our living environment than small trees in terms of conserving energy, reducing stormwater runoff, mitigating urban heat island effect, improving local microclimate, improving soil and water quality, enhancing visual attractiveness and promoting health and well-being. Although planting large trees may require a higher upfront cost from a long-term perspective, the considerable benefits brought by established mature large trees outweigh the cost of planting a group of small trees within the same space.

However, with a high density urban area and narrow streetscape, planting space in Hong Kong is largely constrained by various functional requirements and complex site situations, such as underground utilities, pedestrian and carriageway width requirements, barrier-free access requirements, building regulations, etc. Flyovers, building line extensions, advertising signboards, traffic headroom and street canopies in older neighbourhoods further compete with the existing trees for overhead growing space. Existing trees are sometimes scarified and extensively pruned to satisfy these functional requirements. Planting or replanting of trees that can reach large mature sizes may not always be possible.

Also, high-rise skyscrapers not only cast large shadows on the ground, but also create wind corridors and wind shields which may have negative impacts on trees. This situation increases the difficulty of selecting the right species for the right places.
Street Tree Selection Guide

Urban Environment

Many researches have proven the benefits of planting large trees in urban landscapes in terms of creating more shaded areas, absorbing more gaseous pollutants, reduced vulnerability to vandalism, cleaning the air and releasing oxygen. However, trees require more space and more years to grow and mature, and maintenance for these trees is essential and relatively expensive.

In urban area, restrictions on the time and frequency of certain horticultural maintenance operations may be imposed to some planting areas as in the case of the central median planters to minimise traffic disruption. This has rendered difficulties for a thorough maintenance services to be carried out to these planters. Understanding that the possibility of human injury and property damage from tree failure in urban areas is significantly higher than the rural areas because of the higher quantity of possible targets and frequent foot traffic, tree selection must balance between maintenance cost / requirements and the tree benefits including social, environmental, visual amenity, etc.

2.2 Opportunities for Hong Kong

Under CAP, Hong Kong 2030+ and BSAP, a strategic framework has been set out to guide Hong Kong into becoming a sustainable and resilient city. One of the strategies is to formulate an urban forestry management strategy. The first step is to formulate a baseline to the current situation and a basis for ensuring biodiversity within the urban forest as part of the management strategy. A sustainable, resilient urban forest will require selecting the most appropriate tree species to deal with current and future challenges.

The next step is to select the appropriate tree species for the location, and to further develop and implement an urban forest management programme that is committed to work in a tree life cycle and provide a better street environment for urban trees to grow. For example, the management programme should be able to allow the selection of appropriate tree species to replace ageing street trees or high-risk trees to form new, potential green corridors within the existing urban framework. Blue-green drainage concept can also be considered in the early planning stage for new streets and for replacement planting where the existing planting area can be improved, as blue-green drainage infrastructure could reduce surface runoff, water pollution, heat island effect, carbon footprint and energy consumption, and blend the natural water environment into the city. These will all require close coordination and input across multi-disciplines to form an integrated and holistic approach that takes into consideration the planning, landscape design, engineering, economics, environmental and general community requirements. With the concerted efforts from different disciplines and professionals, our urban forests will be sustainable, resilient and healthy for passing on to the future generations.

3. Principles and Strategies

3.1 Principles and Strategies

The Government has committed to develop Hong Kong into a sustainable and enjoyable place to live and work through the promotion of resilient and adaptive landscapes, enriching vegetation diversity, applying robust urban forestry principles, and enhancing blue and green eco-services networks. In response to policy initiatives and action plans set out in CAP, Hong Kong 2030+ and BSAP, 3 considerations guiding the decision making in street tree selection have been identified. They are summarised in Figure 4-1. Details are listed as follows:

RIGHT TREE (ensuring the suitable tree species are selected)

- **Build a sustainable, resilient and adaptive urban forest** – A healthy, biodiverse urban ecology is more resilient to climate change and potential pest outbreaks due to the widened gene pool. A rich vegetation diversity can support a higher diversity of fauna by providing a variety of different food and habitats for urban wildlife. With a smart selection of tree species mix and CVCM combined with proper planting and management practices, urban forest can help the city to cope and adapt with potential environmental challenges in the future.

- **Minimise risk of tree failure** – Trees should be assessed if they are high risk trees (Black or Red Category under TRIAGE, Tree Risk Assessment and Management Arrangement) or have reached the end or near the end of their ULE. High risk trees have high potential of tree failure and should be replaced as soon as feasible especially if targets are identified. For other trees, an assessment of the ULE should be conducted. This includes analysing the tree maintenance costs and the tree benefits provided in terms of monetary value. A tree is deemed to have reached the end of its ULE and ready for tree replacement when the tree maintenance costs outweigh the tree benefits provided.

- **Improve vegetation and soil health by planting species that can coexist within the same niche** – CVCM can further support similar fauna in terms of increased variety of food and habitat. Some CVCM can even aid in decreasing soil erosion and improve urban soil health through nitrogen fixation that will be beneficial to adjacent trees. Proper selection is required to ensure the CVCM do not overly compete with the tree for nutrients.

- **Select planting species that can tolerate, mitigate and adapt to future climatic extremes and weather events** – As reported by Hong Kong Observatory (HKO), there is evidence that local Hong Kong weather is already affected by climate change. Effects of climate change include summers becoming increasingly hot and for longer periods, higher average temperatures, higher annual rainfall and fiercer typhoons. Temperature changes can affect potential pests’ life cycle or widen the pests’ geographical range, enabling pest and disease dispersal via new flight routes or vectors. New pests and diseases, previously not found in Hong Kong, may also occur. Similarly, higher temperatures may cause foliage and trunk scorch in some tree species. Fiercer typhoon may cause a higher frequency of tree uprooting. As such, the tree species selection for the urban forest should give priority to trees with higher resistance to potential pest and pathogens outbreak and be able to tolerate the changing climate and extreme weather.
RIGHT PLACE (ensuring the planting place is suitable)

- **Promote place-based landscape** – Landscape is more than planting vegetation. Landscape encompasses all aspects of the outdoor environment including hard and soft elements such as landform, water, water bodies and vegetation. Moreover, landscape must consider making “places for people”. The planning and design of our outdoor environment including street shall address human life in our city, with respect to the site context including physical environmental, social and cultural considerations, and relationship with adjacent land uses and building structures. Proper street design with appropriate planting is one of the important elements in creating an attractive place identity and sustainable landscape within our urban environment.

- **Select plants adaptable to multiple urban street functions with a focus on walkability** – Planting trees in tree pits may be preferable for certain street environs to maximise available open space at ground level for other street functions. Overhead space (e.g. signage, traffic lights, traffic sightlines) should also be studied for site specific considerations before selecting the appropriate tree species. To enhance walkability, a pleasant microclimate is crucial. With the increasingly hot summers in the city and the urban heat island effect, trees that cast shade in summer should be given priority in more heavily trafficked streets.

- **Strengthen blue-green corridors** – Identifying streets for possible blue-green corridor transformation or enhancing existing corridors with appropriate planting can greatly decrease the effects of habitat fragmentation. Planting tree species of higher ecological value and maintaining larger size trees in these blue-green corridors can increase habitat attractiveness to urban wildlife and facilitate wildlife movements.

- **Maximise opportunities for blue-green infrastructure** – Blue-green infrastructure aims to mimic natural water cycle through infiltration, evaporation and transpiration to capture rain, control flood and reuse stormwater. Stormwater can be captured and reused for street planting. Harvesting stormwater for landscape should be considered in the early stages of urban planning and in the planter design for successful incorporation into the maintenance and management program.

FOR US (ensuring the function of the tree is reached)

- **Design for safety and liveability** – Planting conducted under the “Right Tree, Right Place” principle with proper maintenance and management practices adopted should minimise tree risk failure, thus, making the streets safer. Improved liveability of a city can be achieved through appropriate street-level design that maximises human comfort, encourage outdoor activities and social interaction. Particular to the Hong Kong context, this includes maximising shade cast by trees in summer heat to create a more comfortable street micro-climate.

- **Respect local identity** – Appropriate tree selection, CVCM and streetscape design would strengthen and enhance the character of the district. The local environment, history, social dynamics and cultural specificities of the community can build a stronger relationship between the people and place and therefore promote place-ecology.
Raise public awareness and understanding – Street trees are a valuable asset of our community. The Government will continue to foster an attitude of care of trees across the territory by the community and to cultivate proper values and attitude towards protecting the environment, including the protection of our street trees with the urban forests.
4. Right Tree

4.1 Roadside Urban Forest Today

A desktop literature review and investigation has been undertaken to understand the current situation of Hong Kong’s roadside urban forest. Two major sources of research data have been thoroughly analysed and compared. They are:

1) “Multipurpose census methodology to assess urban forest structure in Hong Kong” (Jim, 2008) – This is a large-scale tree survey conducted from 1985 to 2008 by a local university that provides comprehensive data on tree composition, conditions and environmental interactions of urban forests in Hong Kong. The study areas covered 124 km² of built-up parts of the core around Victoria Harbour that include ten urban districts. The ten districts are: 1) Central & Western; 2) Southern; 3) Eastern; 4) Wan Chai; 5) Yau Ma Tei & Tsim Sha Tsui; 6) Mong Kok; 7) Sham Shui Po; 8) Kowloon City; 9) Wong Tai Sin; 10) Kwun Tong. All roadside planting in public roads of the 10 districts were studied. Raw data on 19,154 roadside trees from 149 species distributed in 509 different streets was collected.

2) Data gathered from the electronic Tree Management Information System (TMIS) on 2 Oct 2016 – The TMIS, developed by the Greening, Landscape, and Tree Management Section (GLTMS) of Development Bureau, is a tree inventory system of existing trees under the management of various government departments. Data was extracted on 2 October 2016, 698,523 trees from 554 different species were collected from all over Hong Kong, of which 12.27% (or 85,705 nos.) of trees were not identified to species level. The overall percentage of the surveyed tree numbers against the known existing tree numbers in TMIS at the date where the data extracted is approximately 70%.

As revealed from the above data sources, in the past, tree species selection tends to be towards a few dominant species. The top twenty species, out of the total 149 species, contributed to approximately 77.5% of the tree recorded as revealed by the tree survey data (Jim, 2008); while the top twenty species, out of the total 554 species, contributed to approximately 49% of the tree recorded by TMIS data (2016).

Variations were observed between the lists of top 20 common species presented by the roadside tree survey by Jim (2008) and the TMIS data (2016). 8 species have been found on both common species lists (refer to Table 4-1) Variations in the species compositions between the two studies were likely accounted by different groups of tree population. In Jim’s study, only street trees located in Victoria Harbour regions were covered, while TMIS’s data covers slope plantation, park plantation and including New Territories and Outlying Islands areas. Moreover, the former study’s dataset was last updated in 2008 versus the latter survey in 2016. Overall, a limited range of common species has dominated the tree population, and a broad range of uncommon species has enriched the species diversity.

There is a prominent increase in the native species population recorded when comparing the two data sources, from 18% in 2008 to 37% in 2016. The increase in native tree population may be accounted by a larger sampling size and the inclusion of roadside slope forests in the TMIS data. For example, native trees (e.g. Schima superba; Machilus chekiangensis) were strategically planted on slope reforestation projects. This may also indicate the recent trend of increased adoption of native species in urban forest planting. For

instance, trial planting of native species (e.g. Ailanthus fordii; Rhodoleia championii) was noted in urban parks. In terms of genera diversity, the top three genera (Acacia, Ficus and Bauhinia) dominated over 21% of the total number of trees recorded in TMIS.

In terms of family diversity, the dominant families included Mimosaceae (10.79%), Myrtaceae (9.9%), Euphorbiaceae (9.11%) and Caesalpiniaceae (8.36%). The dominance of Mimosaceae family was largely contributed by the abundance of Acacia confusa, which had an occurrence of 7.87%. Other species in the Mimosaceae family include Leucaena leucocephala (0.78%), Acacia auriculiformis (0.77%), Acacia mangium (0.74%), Albizia lebbeck (0.48%), Albizia julibrissin (0.04%), Archidendron lucidum (0.04%), Archidendron clypearia (0.03%) and few minor species which had occurrence less than 0.01% (refer to Table 4.1, 4.2 and 4.3).

TMIS did not include data on tree size and age. From Jim (2008), data showed that small-sized trees dominated roadside planting. Two-thirds of the trees surveyed had height less than 5m, crown spread less than 5m and diameter at breast height (DBH) less than 150mm. Only approximately 10% of trees were large in size (with DBH more than 300mm). Jim (2008) concluded that a majority of young and small-sized trees represented a recent spate of diligent planting efforts. Also, many trees failed to reach their maximum dimensions due to urban environmental constraints such as limited roadside planting space, close proximity to buildings and overhead structures. These harsh urban environment constraints also restricted the planting of trees with larger mature sizes.
Street Tree Selection Guide

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Chinese Common Name</th>
<th>Family</th>
<th>Provenance</th>
<th>Occurrence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acacia confusa</em></td>
<td>台灣相思</td>
<td>MIMOSACEAE</td>
<td>Exotic</td>
<td>7.87</td>
</tr>
<tr>
<td>Melaleuca cajuputi subsp. cumingiana *</td>
<td>白千層</td>
<td>MYRTACEAE</td>
<td>Exotic</td>
<td>3.80</td>
</tr>
<tr>
<td><em>Bauhinia x blakeana</em></td>
<td>洋紫荊</td>
<td>CAESALPINIACEAE</td>
<td>Native</td>
<td>3.62</td>
</tr>
<tr>
<td><em>Macaranga tanarius var. tomentosa</em></td>
<td>血桐</td>
<td>EUPHORBIACEAE</td>
<td>Native</td>
<td>3.59</td>
</tr>
<tr>
<td><em>Ficus microcarpa</em></td>
<td>榕樹 (細葉榕)</td>
<td>MORACEAE</td>
<td>Native</td>
<td>3.37</td>
</tr>
<tr>
<td>Schefflera heptaphylla</td>
<td>鵝掌柴 (鴨腳木)</td>
<td>ARALIACEAE</td>
<td>Native</td>
<td>2.48</td>
</tr>
<tr>
<td>Casuarina equisetifolia</td>
<td>木麻黄</td>
<td>CASUARINACEAE</td>
<td>Exotic</td>
<td>2.41</td>
</tr>
<tr>
<td><em>Lagstroemia speciosa</em></td>
<td>大花紫薇 (洋紫薇)</td>
<td>LYTHRACEAE</td>
<td>Exotic</td>
<td>2.31</td>
</tr>
<tr>
<td><em>Livistona chinensis</em></td>
<td>蒲葵</td>
<td>ARECACEAE</td>
<td>Exotic</td>
<td>2.27</td>
</tr>
<tr>
<td>Celtis sinensis</td>
<td>朴樹</td>
<td>ULMACEAE</td>
<td>Native</td>
<td>2.27</td>
</tr>
<tr>
<td>Sterculia lanceolata</td>
<td>假蘋婆</td>
<td>STERCULIACEAE</td>
<td>Native</td>
<td>2.17</td>
</tr>
<tr>
<td>Cinnamomum camphora</td>
<td>樟</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>2.03</td>
</tr>
<tr>
<td>Lophostemon confertus</td>
<td>紅膠木</td>
<td>MYRTACEAE</td>
<td>Exotic</td>
<td>1.57</td>
</tr>
<tr>
<td><em>Delonix regia</em></td>
<td>鳳凰木</td>
<td>CAESALPINIACEAE</td>
<td>Exotic</td>
<td>1.44</td>
</tr>
<tr>
<td>Eucalyptus spp.</td>
<td>桉屬</td>
<td>MYRTACEAE</td>
<td>Exotic</td>
<td>1.41</td>
</tr>
<tr>
<td>Mallotus paniculatus</td>
<td>白楸</td>
<td>EUPHORBIACEAE</td>
<td>Native</td>
<td>1.40</td>
</tr>
<tr>
<td>Aleurites moluccana *</td>
<td>石栗</td>
<td>EUPHORBIACEAE</td>
<td>Exotic</td>
<td>1.32</td>
</tr>
<tr>
<td><em>Hibiscus tiliaceus</em></td>
<td>黃槿</td>
<td>MALVACEAE</td>
<td>Native</td>
<td>1.29</td>
</tr>
<tr>
<td>Spathodea campanulata</td>
<td>火焰樹</td>
<td>BIGNONIACEAE</td>
<td>Exotic</td>
<td>1.21</td>
</tr>
<tr>
<td><em>Bauhinia variegata</em></td>
<td>宮粉羊蹄甲</td>
<td>CAESALPINIACEAE</td>
<td>Exotic</td>
<td>1.19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>49.02%</strong></td>
</tr>
</tbody>
</table>

Note: * species also being the top 20 common species in the roadside tree survey by Jim (2008).

*Table 4-1 - Frequency of Occurrence of the Top 20 Common Urban Trees in Hong Kong on TMIS (2 October 2016)*
Street Tree Selection Guide

<table>
<thead>
<tr>
<th>Genus</th>
<th>Genus (Chinese)</th>
<th>Family</th>
<th>Family (Chinese)</th>
<th>Occurrence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACACIA</td>
<td>金合歡屬</td>
<td>MIMOSACEAE</td>
<td>含羞草科</td>
<td>9.38</td>
</tr>
<tr>
<td>FICUS</td>
<td>榕屬</td>
<td>MORACEAE</td>
<td>桑科</td>
<td>6.09</td>
</tr>
<tr>
<td>BAUHINIA</td>
<td>羊蹄甲屬</td>
<td>CAESALPINIACEAE</td>
<td>蘇木科</td>
<td>5.80</td>
</tr>
<tr>
<td>MELALEUCA</td>
<td>白千層屬</td>
<td>MYRTACEAE</td>
<td>桃金娘科</td>
<td>3.82</td>
</tr>
<tr>
<td>MACARANGA</td>
<td>血桐屬</td>
<td>EUPHORBIACEAE</td>
<td>大戟科</td>
<td>3.59</td>
</tr>
<tr>
<td>CINNAMOMUM</td>
<td>樟屬</td>
<td>LAURACEAE</td>
<td>樟科</td>
<td>2.89</td>
</tr>
<tr>
<td>EUCALYPTUS</td>
<td>桉屬</td>
<td>MYRTACEAE</td>
<td>桃金娘科</td>
<td>2.62</td>
</tr>
<tr>
<td>SCHEFFLERA</td>
<td>鵝掌柴屬</td>
<td>ARALIACEAE</td>
<td>五加科</td>
<td>2.60</td>
</tr>
<tr>
<td>CASUARINA</td>
<td>木麻黄屬</td>
<td>CASUARINACEAE</td>
<td>木麻黄科</td>
<td>2.41</td>
</tr>
<tr>
<td>LAGERSTROEMIA</td>
<td>紫薇屬</td>
<td>LYTHRACEAE</td>
<td>千屈菜科</td>
<td>2.36</td>
</tr>
<tr>
<td>CELTIS</td>
<td>朴屬</td>
<td>ULMACEAE</td>
<td>楸科</td>
<td>2.30</td>
</tr>
<tr>
<td>LIVISTONA</td>
<td>蒲葵屬</td>
<td>ARECACEAE</td>
<td>棕櫚科</td>
<td>2.28</td>
</tr>
<tr>
<td>STERCULIA</td>
<td>藤婆屬</td>
<td>STERCULIACEAE</td>
<td>梧桐科</td>
<td>2.18</td>
</tr>
<tr>
<td>LOPHOSTEMON</td>
<td>紅膠木屬</td>
<td>MYRTACEAE</td>
<td>桃金娘科</td>
<td>1.57</td>
</tr>
<tr>
<td>MALLOTUS</td>
<td>野桐屬</td>
<td>EUPHORBIACEAE</td>
<td>大戟科</td>
<td>1.44</td>
</tr>
<tr>
<td>DELONIX</td>
<td>凤凰木屬</td>
<td>CAESALPINIACEAE</td>
<td>蘇木科</td>
<td>1.44</td>
</tr>
<tr>
<td>MACHILUS</td>
<td>潤楠屬</td>
<td>LAURACEAE</td>
<td>樟科</td>
<td>1.35</td>
</tr>
<tr>
<td>ALEURITES</td>
<td>石栗屬</td>
<td>EUPHORBIACEAE</td>
<td>大戟科</td>
<td>1.32</td>
</tr>
<tr>
<td>HIBISCUS</td>
<td>木槿屬</td>
<td>MALVACEAE</td>
<td>錦葵科</td>
<td>1.29</td>
</tr>
<tr>
<td>SPATHODEA</td>
<td>火焰木屬</td>
<td>BIGNONIACEAE</td>
<td>紫葳科</td>
<td>1.21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>57.95</strong></td>
</tr>
</tbody>
</table>

*Table 4-2 - Frequency of Occurrence of the Top 20 Genera of Urban Trees in Hong Kong on TMIS (2 October 2016)*
<table>
<thead>
<tr>
<th>Family</th>
<th>Family (Chinese)</th>
<th>Occurrence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIMOSACEAE</td>
<td>含羞草科</td>
<td>10.79</td>
</tr>
<tr>
<td>MYRTACEAE</td>
<td>桃金娘科</td>
<td>9.90</td>
</tr>
<tr>
<td>EUPHORBIACEAE</td>
<td>大戟科</td>
<td>9.11</td>
</tr>
<tr>
<td>CAESALPINIACEAE</td>
<td>蘇木科</td>
<td>8.36</td>
</tr>
<tr>
<td>MORACEAE</td>
<td>桑科</td>
<td>6.64</td>
</tr>
<tr>
<td>ARECACEAE</td>
<td>棕櫚科</td>
<td>6.03</td>
</tr>
<tr>
<td>LAURACEAE</td>
<td>樟科</td>
<td>5.09</td>
</tr>
<tr>
<td>ARALIACEAE</td>
<td>五加科</td>
<td>2.61</td>
</tr>
<tr>
<td>CASUARINACEAE</td>
<td>木麻黃科</td>
<td>2.41</td>
</tr>
<tr>
<td>LYTHERACEAE</td>
<td>千屈菜科</td>
<td>2.36</td>
</tr>
<tr>
<td>ULMACEAE</td>
<td>楸科</td>
<td>2.32</td>
</tr>
<tr>
<td>STERCULIACEAE</td>
<td>梧桐科</td>
<td>2.27</td>
</tr>
<tr>
<td>BIGNONIACEAE</td>
<td>紫葳科</td>
<td>1.50</td>
</tr>
<tr>
<td>MALVACEAE</td>
<td>錦葵科</td>
<td>1.32</td>
</tr>
<tr>
<td>CUPRESSACEAE</td>
<td>柏科</td>
<td>1.18</td>
</tr>
<tr>
<td>MELIACEAE</td>
<td>楝科</td>
<td>1.15</td>
</tr>
<tr>
<td>THEACEAE</td>
<td>山茶科</td>
<td>0.97</td>
</tr>
<tr>
<td>APOCYNACEAE</td>
<td>夾竹桃科</td>
<td>0.94</td>
</tr>
<tr>
<td>BOMBACACEAE</td>
<td>木棉科</td>
<td>0.88</td>
</tr>
<tr>
<td>SAPINDACEAE</td>
<td>無患子科</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>76.69</strong></td>
</tr>
</tbody>
</table>

*Table 4-3 - Frequency of Occurrence of the Top 20 Families of Urban Trees in Hong Kong on TMIS (2 October 2016)*
4.2 Limitation of Research Information

The survey conducted by Jim in 2008 is considered to be outdated as it was done 10 years ago and only selected urban areas were surveyed. Also, some urban trees may no longer exist due to various reasons, such as, collapsed during inclement weather, construction works, etc. As such, the TMIS has been used as the main basis for this Study as it is the best available and most comprehensive data source covering a large extent of Hong Kong urban areas at the time of the Study. The TMIS covers tree data from eight core tree management departments, namely AFCD, ArchSD, CEDD, DSD, HYD, HD, LCSD and WSD. It is noted that there are some unidentified tree species within the gathered TMIS data. However, these species only covered a small majority of tree data gathered and should not have a significant effect on the general analysis on the dominance of tree species planted. Also, the TMIS data does not include information on tree size, dimension, age, date of planting, and roadside trees under private maintenance and management. This information, if available could facilitate the analysis on the distribution of tree size diversity and tree age population within the urban area.

The TMIS tree data sorted covers roadside street trees, man-made slope plantation and trees with public parks and government properties under the management of ArchSD, CEDD, HyD, LCSD and other government departments. This data adopted gives a good baseline on the tree species mix of our existing urban forest. However, it does not provide analysis of tree health condition and their suitability of planting in different road hierarchies.

Finally, although many researches have been conducted on the benefits and ULE of urban trees, these studies are conducted outside of Hong Kong. The extent of benefits brought by urban trees, especially in the context of economic and social aspects, are not specific to Hong Kong.

4.3 Approach to the Guide

The urban environment is predominantly man-made built-up areas. Roadside planting environments are especially harsh for trees. The effects of climate change may make the environments even more difficult for trees to grow. In the Guide, the recommended tree species for Hong Kong urban streets shall be species that can establish and survive in stressful urban conditions and fulfil their required functions, rather than simply restricted to only native species. Vegetation diversity is essential for a resilient urban forest. Planting a mix of exotic and native species can help maintain the health and resilience of the urban forest. Basing on this, the Guide has examined both native and exotic tree species to match street planting requirements.

To promote vegetation diversity, this Guide seeks to explore lesser known species for urban street planting to enrich biodiversity based on the 10-20-30 rule (refer to Section 1.6). The existing top 20 dominant roadside tree species are therefore not selected for further study and inclusion into the Guide (Table 4-1).

Under the principle of “Right Tree, Right Place” and the strategies mentioned in Section 3, the decision-making criteria affecting street tree selection were deduced (Figure 4-1).
Figure 4-1 - Tree Selection Criteria
Street Tree Selection Guide

To summarise, the main strategies in selecting tree species appropriate for Hong Kong urban street planting are as follows:

- Non-dominant species to enhance urban forest diversity
- Tree species that nurture local biodiversity by providing ecological benefits to local fauna in Hong Kong
- Native tree species with good potential for street planting
- Species that can be propagated with existing technology or species that are currently commercially available
- Tree species planted in Hong Kong under similar roadside environments and observed to have relatively good tree health and condition. For instance, *Machilus* spp. is observed to do quite well in highly polluted areas.

4.4 Street Tree Selection Criteria – Essential Attributes

The Essential Attributes are the fundamental abilities of the tree to survive and maintain its physiological functions in the urban street environment. These are the basic requirements that need to be met before a tree species will be further considered. Species with a “low” rating in any essential attribute is regarded as not suitable and therefore has not been shortlisted. Details for the rating are included in Appendix B. The Essential Attributes and their ratings are described below:

**Climate Resilience**

- **Heat tolerance**

  Hong Kong has a sub-tropical climate, where mean temperature in summer is generally around 26°C but the temperature often exceeds 31°C in the afternoon. It is expected that the overall mean temperature to increase further by 1.5-3°C by mid-21st century\(^\text{18}\) due to global warming. Recorded by the Hong Kong Observatory (HKO), the mean temperature for summer in Hong Kong is 29.1°C in 2016.\(^\text{19}\) Species that can withstand to 29°C summer mean temperature but with sign of leaf or bark burn or abnormal health stresses are rated as "low" and have not been considered further as they are unable to tolerate mean summer temperature and anticipated adverse climatic conditions.

- **Drought tolerance**

  Hong Kong experiences a hot and humid summer and relative dry and cool winter. Dry spells occasionally occur starting from November to February and can last up to 3 months. Severe drought may affect water supply and reliance on irrigation may not be sustainable in the long run. According to HKO, in the past 10 years, the longest dry spell with monthly rainfall below 10mm lasted for a period

---


Street Tree Selection Guide

of 3 months. One of the measures to decrease water usage is through planting suitable tree species. According to HKO, maximum duration of absolute drought in Hong Kong is 60 days in the last century.\(^{20}\) Established roadside tree species that can tolerate less than 1 month dry spell and require supplemental watering were rated “low” due to their high water demand and have not been considered further.

- **Waterlogging tolerance**

As reported by HKO, extreme precipitation has become more frequent in the last 100 years, with the hourly rainfall records increasing more than 60%, breaking past rainfall records at an unprecedented rate. It is predicted that the annual rainfall and occurrence for extremely wet years for Hong Kong and around southern China will increase.\(^{21}\) Large volumes of stormwater runoff may cause sudden flooding and water-logged soil conditions. Most tree species can withstand one to four months of flooding during the dormant season. However, when flooding occurs during the growing season, especially during warmer weather, one to two weeks of flooding can cause major and long-term root damage to sensitive trees and shrubs, leading to tree decline and even death with some species.\(^{22}\) Tree that require well-drained pit, or cannot survive in a saturated pit for less than one week were rated “low” and have not been considered further.

**Life-Cycle Planning**

Street tree planting should be designed for safety and liveability. One of the ways to do this is through proper life-cycle planning for urban trees. Life-cycle planning can be broken down into the following four key aspects:

- **Urban Useful Life Expectancy**

Urban Useful Life Expectancy (urban ULE) is an estimate of how long a tree is likely to beneficially contribute and remain in the urban landscape based on health, amenity, environmental services, cultural contributions to the community that warrants the cost of maintenance. The urban ULE gives the approximate time in which tree replacement should be considered, and thus continuing the life-cycle.

In general, a mixed ULE for urban street trees is preferable to minimize the potential loss of visual quality from sudden loss of a large group of trees at the same time. Choosing tree species with long urban ULE provide benefits to the community for a longer period with less cost. However, long urban ULE should be balanced against other tree selection criteria and the age of the tree community in the surrounding. Tree species with a very short urban ULE require higher maintenance cost as they need to be replaced sooner. Species projected with less than 20 year growth before senescence were rated “low” due to their short lifespan and have not been considered further.

- **Wind Tolerance**

---


Wind is the main mechanical stress on trees in Hong Kong due to tropical cyclones and monsoons typically occurring from April to October. They can cause severe damage to trees incurring risk to public safety and properties. There are two main types of tree damages. Brittle trees may lose their branches, leaves or even major limbs during intense winds; and shallow-rooted trees may blow over entirely. Adequate tree support can stabilise the trees during establishment and reduces the occurrences of tree limb failure. Nevertheless, trees that have brittle limbs and low mechanical stress requiring extra support throughout most of the tree’s life-cycle were rated “low” and have not been considered further as they required high maintenance cost maintenance and lead to safety issues.

- **Manageability**

Newly planted street trees require regular maintenance (e.g. irrigation, weeding, fertilisation, etc.) during the establishment period. The need of maintenance lessens as the tree reaches establishment and maturity. Other maintenance issues may arise due to extensive tree branches, aggressive root system, leaf littering and fruit dropping on footpaths, blocked drains, etc. which would be a nuisance and safety concern to public. Tree species that do not require regular high maintenance frequency are preferred. Species with large amount of plant litter with potential to block drains, or with fruit or seed drops creating sticky footpath surfaces were rated "low" and have not been considered further.

- **Crown Management**

In urban roadside area, accessibility for pruning may be an issue in particularly for trees planted within the central median. Partial closure of a lane may be required to carry out tree pruning works as part of the normal horticultural maintenance and also to avoid obstruction to traffic sightlines. Smaller sized trees with fast growth rate and wide spreading crown will require frequent pruning and were rated “low” due to high maintenance cost.

**Pest and Disease Resistance**

Changes in temperature and moisture will directly affect the growth, spread, range and survival of pests, pathogens, vectors and competitors. As this will have significant direct effects on pests and pathogens’ behaviour and population, the timing and severity of outbreaks may also be affected. Diseased trees require higher and more regular maintenance and may present hazards to pedestrians and vehicles alike. A “low” rating was given to tree species with a history of pathogen outbreaks in Hong Kong or require an aggressive regime of treatment and have not been considered further.

### 4.5 Street Tree Selection Criteria – Valued Attributes

Valued Attributes are the tree characteristics that will benefit ecological, human or/and other valued aspect. These are the desirable criteria and are applied depending on the local site context and road hierarchies and conditions. Details for the rating are included in Appendix B. The Valued Attributes are described below:

**Roadside Pollution Tolerance**

Street trees in urban areas should be able to withstand the polluted roadside environments. For example, trees planted in the central median greening zone have to tolerate a high level of traffic density
Street Tree Selection Guide

which causes air and runoff pollution. Therefore, a highly valued attribute for street tree selection is the capability to tolerate urban pollution. Some tree species may even be effective in reducing pollutants and/or particulates. 23

Pruning Tolerance

Most roadside trees require pruning from time to time to maintain clear headroom for pedestrians and vehicles, clear sightlines, reduce wind resistance, maintain or improve tree appearance and promote or reduce tree growth. Pruning tolerance of a species is assessed by its ability to compartmentalize and recover from pruning wounds over a period of time.

Urban Soil Adaptability

- **Soil Compaction Tolerance**

Soil compaction is defined as the mechanical increasing of soil density. Soil compaction is affected by soil type, changes in soil moisture content and the type of stress applied to the soil. Many urban planting sites are surrounded by hard paving with compacted sub-soil base. Soil compaction in urban streets may increase over time through regular foot traffic. Compacted soils have poor aeration and lower oxygen level. Tree selected for these sites should have the ability to tolerate relatively low soil oxygen levels and compacted soil conditions (e.g. *Taxodium distichum* & *Juniperus chinensis* cv. Kaizuka). Species that can survive with restricted soil aeration were rated “High”.

- **Root System (Manageability)**

Aggressive tree root system can uplift pavement causing tripping hazard to pedestrians. Species with aggressive root system should only be considered where there is sufficient space to accommodate the tree root system or where there is no significant limitation to soil volume.

- **Soil Volume Tolerance**

Confined planting sites (e.g. planting area with narrow width and/or closed, compacted bottom with defined volume of soil) are common to roadside planting situations. Trees with large rooting system in a confined planting site may result in root girdling, shallow rooting surface and pre-mature decline. Generally, species with larger mature size will have larger rooting system. Small-sized species with smaller root system would be more suitable for planting in sites with confined soil volume (e.g. *Polyalthia longifolia* & *Pongamia pinnata*). Tree species that can perform in small planting sites (1.2m to 1.5m dia. x 1.2m depth) are rated as “High”.

- **pH of Soil (Range)**

Street Tree Selection Guide

Urban soil with alkaline condition is common as soils are often contaminated by construction debris containing calcareous materials. Literature suggests that a pH in the range of 6.0 to 6.5 is generally favourable for most plants. Planting areas (either new or existing) will be filled with new topsoil with the acceptable soil pH level of 5.5 – 7.0, according to ArchSD GS 25.02 (a)(iii)24 and CEDD GS 3.30 (2)(a)25. However even though soil pH level can be modified, for cost-effectiveness, soil pH tolerance should also be considered as one of the valued attributes.

Tree Size Dimension

Generally large trees provide more positive impacts on urban ecology and the living environment than small-sized trees. They can increase urban biodiversity by providing more habitat areas, mitigate UHI effect, conserve more energy, improving local microclimate, soil and water quality, reducing stormwater runoff, enhancing visual attractiveness, promoting health and well-being better than small trees. Under the main principle, the selection of tree species should be appropriate to local environment conditions and constraints of the planting site. Given due consideration to site constraints, tree species with large ultimate size are encouraged for planting as far as practicable.

Ecological Value

Trees that provide a stable food source or habitat for wildlife (e.g. birds, fruit bats, butterflies, etc) could create ecological corridors in urban areas and enhance the green linkage between natural habitats and improve urban biodiversity and genetic diversity for both plants and animals. Establishing a stable ecosystem can help regulate pests and diseases through activities of its natural predators and parasites.

Ornamental Value

Species that relate to Hong Kong’s cultural or historical context, appeals to one of the 5 senses, have unique tree form, bear fragrant flowers or fruits and provide high ornamental value for a prolonged period of time were rated as having high ornamental value.

Shade Cast

Shade casted by trees can help to reduce heat absorption by paved surfaces, buildings and road and thus reduce UHI effect. This rating provides a qualitative estimate of the degree of shade cast projected by a tree. In general, the larger the crown spread coupled with higher foliage density and bigger leaf size/area, the better shade cast is expected to be provided by the tree. Since Hong Kong winters are usually mild, summer shade is considered to be of greater importance in offering a comfortable walking environment to the pedestrian. The ratings of shade cast in this Guide are primarily based on scientific and visual judgement of the canopy.

5. Right Place

5.1 Introduction

Each street has its own spatial limitations set by relevant standards and guidelines which form the basic and fundamental requirements for safety of road users including pedestrian and motorist. In order to maximise tree planting opportunity and fulfil the fundamental safety requirements, early coordination between Engineers, Landscape Architects and Designers is required at planning and design stage.

Existing urban street spatial elements and surrounding conditions within urban Hong Kong areas were identified and analysed. These streets were first categorised into 3 main road hierarchies, Primary Distributor Road, District Distributor Road and Local Distributor Road as defined in the Transport Planning and Design Manual (TPDM) as a baseline. Further analysis was conducted on the spatial conditions and the surrounding environs of these 3 road hierarchies. These road hierarchies were then further categorized into 7 main street typologies and 14 sub-types based on the street surroundings.

Expressways, highways and trunk roads were not covered in this Study as they are considered to have very specific requirements and special needs different from the common street typologies. Pedestrianised streets were also excluded in this Study due to their special street characteristics. For the purpose of this Study, urban areas mean built-up areas within the Hong Kong Island, Kowloon and the New Territories.

5.2 Review of Existing Roadside Tree Planting Standards Requirements & Guidelines

To form a baseline for further study into the existing urban street conditions, the latest technical requirements, standards and guidelines relevant to roadside planting were analysed and summarised in Figure 5-1 and 5-2.
RELEVANT ROADSIDE PLANTING REQUIREMENTS AND GUIDELINES

GENERAL NOTES

Tree Planting and other Form of Roadside Planting Aspects
- Landscape areas should be identified in the early planning stage, so long as the minimum clear width of footpath can be provided.
- Planting can be used to change the perceived width of a road, to define a gateway and to improve the overall environment.
- Trees should be planted clear of traffic signals and/or traffic signs to ensure their visibility. Furthermore, they should not be planted in such locations that may hinder the operation and maintenance of speed enforcement cameras and traffic surveillance equipment/facilities, such as CCTV cameras, automatic incident detectors, police observation spots, etc.
- Trees should be planted at least 5m (measured along the carriageway) away from the approach side of a pedestrian crossing, run-in or a bus stop.
- Trees should be planted at least 10m (measured along the carriageway) away from a road junction.
- A minimum lateral clearance of 800mm should be maintained between the outside part of the tree trunk including tree guard and kerbside. This dimension should be increased to 1.0m for high speed roads with a designed speed limit of 70km/h or above.
- Adequate footpath widths should be maintained to cater for pedestrian traffic.
- For avenues/street tree planting, the trees should normally be spaced at a minimum distance of 5m from centre to centre. However, such requirement is not applicable if the trees are planted at the back of a footpath or in the CMGZ.
- Lowest tree branch overhang should have a minimum height clearance of 5.5m. If the branch overhang occurs above a footpath or cycletrack, it should have a minimum height clearance of 2.5m.
- Trees planted within visibility splays should have a high canopy and a single slender trunk to ensure minimal obstruction of driver vision is affected.
- Trees should be planted at least 5m from existing street lighting to avoid shading effect.
- Agreement should be obtained from the relevant maintenance authority for the future maintenance of trees, including trimming of branches, felling and transplanting, if necessary, due to traffic management schemes.
- Tree planting, including small canopy trees, upright tree/palm with narrow trunks, turf, groundcovers or low shrubs, is allowed along the kerbside as long as they will not cause sightline and visibility problems. Alternatively, trees can be planted away from the kerb, such as at the back of footpath.
- In the CMGZ of a dual carriageway approach to a roundabout and the central island of a roundabout with diameter less than 10m, tree planting is restricted for preservation of visibility. But groundcovers, turf or low shrubs can be planted.
- Raised planters adjacent to footpath can provide a very attractive feature and improved pedestrian environment. However, additional footpath width should be provided to allow for any shrubs in the raised planter to grow over the footpath as the plant can reduce the effective footpath width.
- To ensure that the planters in the vicinity of crossings will not obscure pedestrians, in particular children, from the view of approaching vehicle drivers, nor interfere pedestrians’ sightlines to coming traffic, the overall height of the planters including shrubs should not exceed 0.5m within 30m on the approach to a crossing.
- Recommended minimum widths for footpath are dependent on peak pedestrian volume and type of land use. They can be summarized as:
  - Commercial and Residential Land use - 2m to 4.5m
  - Industrial Land use - 3.5m to 4.5m
- Vertical clearance for structures over footpaths:
  - Over and within 0.6m of a carriageway - 4.1m
  - Over a footpath but not within 0.6m of a carriageway - 3.5m
- Projection of signage should not be more than 4.2m from the main building line or beyond the center of the street. Minimum clearance of 5.8m is needed if signage is projecting over a street. If signage is projecting over a pavement, it should have a minimum clear distance of 1m from the kerb and a minimum clearance of 3.5m. Two adjacent signs should have a lateral distance of 2.4m. Two signs erected from opposite sides of street should have a minimum clear distance of 3m.
- Building frontage zone minimum width is to be 1m for areas with shopping frontage.

Maintenance and Management Aspects
- The safe operation of the road as well as method of maintaining any planting or other elements associated with landscaping should be considered at the design stage. In this respect, the maintenance authorities should be consulted on the proposals before they are implemented and preferably during the design process.
- Landscape designs which require frequent and regular maintenance, whether by persons on foot or in slow moving vehicles, which increases the risk to operatives and other road users, must be avoided.
- If tree planting are planned for verges, embankment, cutting or similar, it provision of water supply is necessary.

REFERENCES
2. “Guide on Erection & Maintenance of Advertising Signs”, Building Department, HKSAR
3. “Hong Kong Planning Standards and Guidelines”, Planning Department, HKSAR, 2016. Print

Figure 5-1 - Relevant Roadside Planting Requirement and Guidelines
<table>
<thead>
<tr>
<th>Road Hierarchy Functional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connection</strong></td>
</tr>
<tr>
<td>Major network of the urban area; Connects centres of main urban areas, main centres of population and activities</td>
</tr>
<tr>
<td><strong>General Design Characteristics</strong></td>
</tr>
<tr>
<td><strong>Carriageway Min. Width</strong></td>
</tr>
<tr>
<td>Single Carriageway</td>
</tr>
<tr>
<td>Double Carriageway</td>
</tr>
<tr>
<td>6.75-7.3m (2 lane)</td>
</tr>
<tr>
<td>7.3 or 10.3m (2 lane)</td>
</tr>
<tr>
<td>Main road network within district</td>
</tr>
<tr>
<td><strong>Max. Speed</strong></td>
</tr>
<tr>
<td>50km/h</td>
</tr>
<tr>
<td>50km/h</td>
</tr>
<tr>
<td><strong>Sight Distance</strong></td>
</tr>
<tr>
<td>Desirable Min.</td>
</tr>
<tr>
<td>Absolute Min.</td>
</tr>
<tr>
<td>70m</td>
</tr>
<tr>
<td>70m</td>
</tr>
<tr>
<td>145m</td>
</tr>
<tr>
<td><strong>24 Hour Stopping Restrictions</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Restricted</td>
</tr>
<tr>
<td><strong>On-street Parking Provision</strong></td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Restricted</td>
</tr>
<tr>
<td><strong>Minimum Headroom for On-street Parking</strong></td>
</tr>
<tr>
<td>Private Cars</td>
</tr>
<tr>
<td>Light good Vehicles</td>
</tr>
<tr>
<td>Medium and Heavy good Vehicles</td>
</tr>
<tr>
<td>Container Vehicles</td>
</tr>
<tr>
<td>Coach and Buses</td>
</tr>
<tr>
<td>Light Buses</td>
</tr>
<tr>
<td><strong>Min. Horizontal Clearance from the Carriageway to Obstruction</strong></td>
</tr>
<tr>
<td>&gt; 3m above 1m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.6m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.6-0.8m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.5m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.6m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.5m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.8m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.6m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.5m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.8m</td>
</tr>
<tr>
<td>Height of object &lt; 3m above 0.6m</td>
</tr>
<tr>
<td><strong>Min. Width of Central Reserves</strong></td>
</tr>
<tr>
<td>2.5m</td>
</tr>
<tr>
<td>2m</td>
</tr>
<tr>
<td>2m</td>
</tr>
<tr>
<td><strong>Min. Width of Roadside Verge Greening Zone</strong></td>
</tr>
<tr>
<td>0.6m</td>
</tr>
<tr>
<td>0.6m</td>
</tr>
<tr>
<td>0.6m</td>
</tr>
<tr>
<td><strong>For Central Median Greening Zone</strong></td>
</tr>
<tr>
<td>Visibility shall not be interfered and the width of central reserve shall be suitably widened to provide sufficient plant growing space with automatic irrigation system. Only low shrubs or small upright trees/palms with narrow trunks can be planted on the central reserve within the sight line envelope.</td>
</tr>
<tr>
<td><strong>Parking and/or loading/unloading space if likely to interfere with through traffic flow</strong></td>
</tr>
<tr>
<td>An additional 3m width on one or both sides of the carriageway should be provided</td>
</tr>
</tbody>
</table>

**REFERENCES**
1. “Hong Kong Planning Standards and Guidelines”, Planning Department, HKSAR, 2018 Print

Figure 5-2 - Road Hierarchy Functional Requirements
5.3 Methodology

There are many spatial considerations from different government standards and guidelines related to the 3 main road hierarchies. Out of all steps, the first and most important step should be to examine the suitability and feasibility of tree planting in the street. Should tree planting be deemed possible, the next step is to identify the road hierarchy and the immediate street environs. This shall give a comprehensive baseline of the spatial considerations for that particular street. Methodology to determine the feasibility of street tree planting is shown in the flowchart below (Figure 5-3).

![Figure 5-3 – Methodology to Determine Suitability of Tree Planting in a Street](image-url)
5.4 Spatial Requirements for Tree Planting

Before considering the tree species, the street should first be analysed for their feasibility to support tree planting. There are 5 main spatial factors to determine the suitability of tree planting in a street location. These are existing underground utilities, through zones requirement and pedestrian flow, building frontage zone requirement, location of bus stops/loading and unloading bays and overhanging structures.

In order for street tree planting to be sustainable, it is essential to satisfy the requirements of these 5 main spatial factors to avoid conflict, creating obstruction and hence reducing subsequent maintenance and premature decline of trees. If these factors cannot be fulfilled, that particular street location is considered unsuitable for street tree planting. Details of these 5 main spatial factors are given below.

It should be noted that these 5 factors may not truly reflect the site context because each street environment is unique. Professional advice from Landscape Architects is recommended to be sought to ensure all suitable roadside planting areas are being explored.

Sufficient Soil Volume & Existing Underground Conditions

The presence of underground utilities, including telecommunications, electricity distribution, town gas pipes, traffic/street light cables, storm water drains, fresh water and wastewater pipes etc., usually located beneath footpaths and limited the underground space and thus available soil volume for tree root growth. Other underground conditions, such presence boulders or man-made structures (e.g. basement ceilings) may further limit the underground space. The general rule of thumb is to have a minimum soil volume of 1.2m x 1.2m x 1.2m for tree planting. Another factor to consider is the proximity of underground structures or utilities to the root growth zone. Additional maintenance difficulties may occur if excavation is required close by the tree protection area. Alternative measures to reduce conflict with underground utilities can be considered in the early planning and design stage, e.g. installation of root barriers to minimize future maintenance complications. Structural elements, such as structural frames and soil cells, can also be assembled underground to enlarge soil volume whilst providing a load-bearing structure to the footpath.

Through Zone

The basic function of a footpath in an urban street is to ensure pedestrian safety by providing a clear physical separation and demarcation from vehicular traffic (the carriageway) with the footpath. The width of the footpath (Through Zone) should be sufficient to cater for basic pedestrian flow and be freely accessible by the disabled. Ideally, this zone should be free of obstructions. In general, the minimum width requirement for the Through Zone is 2m, which is considered sufficient to provide an adequate environment for two-way flow by pedestrians and wheelchair users, especially on streets with moderate to low pedestrian flow. In general, footpaths with Through Zone less than 2m wide are not recommended to plant trees.

Building Frontage Zone

The Building Frontage Zone is the area between the Through Zone and the edge of buildings. It is a separate zone and cannot be calculated as part of the Through Zone. This zone accommodates cross movements into adjacent buildings, allows area for browsing and shopping frontages and provides pedestrians with additional moving space adjacent to buildings. As such, it is not recommended to
plant trees within this zone to prevent obstruction. According to HKPSG, Building Frontage Zone with width of 0.5m should be allowed for dead areas and increased to 1m for streets with active shopping frontages.

**Location of Bus Stops, Loading and Unloading Bays, Pedestrian Crossings and Run-in**

Bus stops and loading and unloading bays include areas dedicated to coaches, school buses, public buses and cars for passenger pick-up and drop-off. As these areas indicate regular and active pedestrian traffic, tree planting is not recommended as it may cause sightline blockage and safety issues. Trees should be planted at least 5m away from the approach side of a bus stop, loading and unloading bays, pedestrian crossing or run-in.

**Overhanging Structure**

Streets with overhanging structures covering part or an entire planting area of a street (e.g. above ground signs and building structures) may limit tree canopy growth. Depending on the extent of the overhead structures, the effect can be significant. It is noted that tree planting opportunities directly under overhanging structures are limited due to extended periods of overshadowing and space restrictions. There may also be conflicts with access requirements as certain types of overhanging structures may require frequent maintenance which will greatly limit the planting area size and thus the type of suitable planting species. Tree planting areas with overhanging structure covering the whole or part of the planting area along the street should be reviewed on a site-by-site basis.

**5.5 Road Hierarchy**

The road hierarchy classification system defined in the TPDM is adopted in this Guide for identifying the street location type because this system best reflects a set of standardised road dimensions and associated footpath standards that are well understood and typically used in Hong Kong across different professional disciplines.

The 3 main road hierarchies in urban areas (including Hong Kong, Kowloon and New Towns) comprise of the following:

(a) Primary distributor roads: Roads connecting the main centres of population. High capacity roads, with no frontage access or development, segregation of pedestrians, widely spaced grade-separated junctions, and 24 hour stopping restrictions 26;

(b) District distributor roads: Roads Linking Districts to the Primary Distributor Roads. High capacity at-grade junctions, with peak hour stopping restrictions and parking restrictions throughout the day 22; and

(c) Local distributor roads: Roads within Districts linking developments to the District Distributor Roads 22.

---

5.6 Spatial Characteristics and Surrounding Street Environs

Spatial characteristic and functional requirements which affect tree species selection considerations in the 3 road hierarchies will be selected for further analysis. These spatial characteristics can be generalised into 3 major categories in which the street typology can be identified. (Refer to Figure 5-6) These are summarised below:

Greening Zones

2 types of greening zones are associated with street tree planting. They are -

- Central Median Greening Zone (CMGZ) is the greening zone at the central median of a carriageway. According to DEVB TC(W) No. 2/2012, CMGZ only occurs in the primary distributor roads and district distributor roads.

- Roadside Verge Greening Zone (RVGZ) is the verge planting zone adjacent to the footpath. RVGZ is usually found along all 3 main road hierarchies. Figure 5-4 shows the relationship between CMGZ/RVGZ and a typical road layout.

Figure 5-4 Relationship between CMGZ/RVGZ and a Typical Road Layout

The size of the greening zone can in future divided into 2 types – wide and narrow, illustrated below.

<table>
<thead>
<tr>
<th>Greening Zone</th>
<th>Road Hierarchy</th>
<th>Planter Width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Wide</td>
</tr>
<tr>
<td>CMGZ</td>
<td>Primary Distributor Road</td>
<td>≥2.5m</td>
</tr>
<tr>
<td></td>
<td>District Distributor Road</td>
<td>≥2m</td>
</tr>
<tr>
<td></td>
<td>Local Distributor Road</td>
<td>n/a</td>
</tr>
<tr>
<td>RVGZ</td>
<td>Primary Distributor Road</td>
<td>≥2m</td>
</tr>
<tr>
<td></td>
<td>District Distributor Road</td>
<td>≥2m</td>
</tr>
<tr>
<td></td>
<td>Local Distributor Road</td>
<td>≥1.5m</td>
</tr>
</tbody>
</table>

Table 5-1 Planter Width for Different Road Hierarchy

Kerbside Activities

Kerbside activities include loading/unloading, on-street parking and vehicle passenger drop-off at the kerb. To facilitate pedestrian movement, tree pits or shorter, non-continuous planters are recommended. Large trees with aggressive root systems may not be suitable for planting in a confined space as they may cause pavement upheaval.

Interface Conditions

Interface condition refers to the direct interface between footpath and the adjacent land use of a street. 2 types were identified - landscape area or property development.

Landscape area refers to an area with no building development adjacent to the street, and it could be public open space, park, green belt, etc. With close proximity to the existing urban forest, species selection could give priority to those with a higher ecological value to enhance or extend the existing habitat areas.

Property development can be further generalised into 2 types – those with building frontage and those without. Building frontage is defined as buildings with active space adjacent to the footpath. This may include shop frontages, entrances, exits and windows. In these areas, visual and physical blockage must be carefully considered when selecting the appropriate tree species.

Buildings without frontage may be areas where a fence is surrounding the property development, or those parts of the building façade without entrances, exits or windows. Depending on the site context, utilising trees for visual screening can aid to soften the straight architectural lines and create a more human-scale space underneath the canopy.
Figure 5-5 – Checklist of Spatial Requirements for Tree Planting in Streets

If all boxes are checked, the street is suitable for tree planting. Professional advice should be sought to identify site specific considerations.

- A minimum soil volume of 1.2m x 1.2m x 1.2m clear of underground utilities, services and other man-made structures or natural features

- Through zone ≥ 2m achieved*

- For active shopping frontage, building frontage zone ≥ 1m achieved
  - OR
  - For deadzone, building frontage zone ≥ 0.5m achieved

- ≥ 5m from the approach side of a bus-stop/ pedestrian crossing/run-in

- ≥ 2.4m from overhanging structures

Note:
* In general, the min. width requirement for through zone is 2 m according to HKPSG. However, the min. through zone width depends on the land use type and the peak pedestrian volume. (pedestrians per minute). Refer to Table 9 of Section 5.8.15, Chapter 8 HKPSG for the recommended min. width standards for through zone width/ peak pedestrian volume for different land use type.
Figure 5-6 Consolidated Summary of the Street Typology Selection Process

1. **CMGZ** means Central Median Greening Zone
   **RVGZ** means Roadside Verge Greening Zone
   (Referred to "Allocation of Space for Quality Greening on Roads", Development Bureau Technical Circular (Works) No. 2/2012)

2. "Kerbside activities" include loading/unloading, on street parking, bus stop or any other major activities taking place along the kerb side in the carriageway.

3. Tree pits and other discontinuous RVGZ are recommended for streets with kerbside activities.

4. "Building frontage" includes shopping frontage, doorways, windows, entrances
   (i.e. no visual/physical blockage required)

5. "Landscape Area" refers to an area with no building development, such as public open spaces, parks, green belt areas etc.

6. Subtype categorize the internal planter width, which means distance between inner wall of planter.
   "W" is wide internal planter width, where:
   (a) for Primary Distributor Road, the min. width should be 2.5m for CMGZ;
   (b) for District Distributor Road, the min. width should be 2m for CMGZ;
   (c) for Primary Distributor Road and District Distributor Road, the min. width should be 2m for RVGZ;
   (d) for Local Distributor Road, the min. width should be 1.5m for RVGZ

   "N" is narrow internal planter width, where:
   (a) for Primary Distributor Road, the width is less than 2.5m for CMGZ;
   (b) for District Distributor Road, the width is less than 2m for CMGZ;
   (c) for Primary Distributor Road and District Distributor Road, the width is less than 2m for RVGZ;
   (d) for Local Distributor Road, the width is less than 1.5m for RVGZ

(Referred to "Allocation of Space for Quality Greening on Roads", Development Bureau Technical Circular (Works) No. 2/2012)

The selection of tree species in accordance with wide or narrow planters, is to be determined by landscape architects or professional designers.
6. For Us

6.1 Introduction

People use streets for many activities, such as walking, sitting, cycling, moving goods, doing business or providing city services. These various activities that streets can accommodate aid to enhance the city’s liveability. The types of users and volume of people in streets are dependent on many factors such as, time of day, size of street, the surrounding environs and local weather. Apart from a thoroughfare providing easy access, a street should also provide a safe and comfortable environment to its users. Although each user moves at a different speed and occupies a different amount of space over a time span for different purposes, the human comfort factor is common to all these users to foster a pedestrian-friendly environment.

6.2 Liveable City

Streets make up of a predominant part of urban landscape in Hong Kong. Streets are the most important element of the public domain in the city, and are fundamental to the appearance and function of the urban environment. In addition to moving vehicular and pedestrian traffic, streets provide the “Place” for social interaction, business activities and portray the image of the city.

Quality streets together with well-designed public spaces are integral to the social, economic and environmental sustainability of Hong Kong and to make a more liveable city for all. Apart from selecting the right trees for the right place, selection should therefore also aim for the users, i.e. the people that drive, walk and work in the streets every day. Tree selection and the associated landscape and planting design shall aim to improve the walkability or comfort of our street environment, encourage outdoor activities and social interaction to support the planning objective of a “liveable high-density city” and “smart, green and resilient Hong Kong” promoted under Hong Kong 2030+.

Some key factors to be considered are listed below as reference. The list is not meant to be exhaustive and should be reviewed / expanded depending on the prevailing street environment.

- Provide shade and moderate microclimate for pedestrian, drivers and buildings
- Contribute to a safer road through calming traffic, slowing speeds and providing buffer between pedestrians and cars
- Helps unify the road corridor environment
- Improve amenity and provide visual interest
- Screen undesirable views and helps filter air pollutants
- Foster sense of place
- Provide human scale within the urban setting with tall buildings and high-rises.
6.3 Site Specific Criteria

The roadside planting environment for each street, even with the same typology could be very different due to the site-specific criteria. Professional advice, such as from Landscape Architects should be sought during the planning and design stage to ensure that all site-specific criteria unique to that street are being considered during the street tree selection process.

Site-specific criteria may exist within a certain part or entirety of that street. Examples of some site-specific criteria are listed in Table 6-1 as a reference. It should be noted that this list is not exhaustive and may not be applicable to all streets. Also, tree selection criteria should not be limited to those stated in this Guide.

Professional advice to ensure that associated supporting elements such as planter details, drainage and irrigation requirements, CVCM, etc. are properly designed/provided in providing suitable growing conditions for the trees. Further study to formulate a street urban forest precinct or master plan taking into consideration the ageing tree replacement can aid to further consolidate a holistic guide in the design, implementation, life-cycle planning and management of the urban forest.

<table>
<thead>
<tr>
<th>Site-Specific Criteria</th>
<th>Design Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory</td>
<td>Consists of the understanding of regulatory, administrative and legal aspects dealing with Hong Kong urban streets. In Hong Kong, different street elements/furniture could be maintained by different government departments/parties. Relevant standards and guidelines related to planting on urban streets should be followed.</td>
</tr>
<tr>
<td>Stakeholders’ feedbacks</td>
<td>Specific tree species may be chosen for the location based on stakeholders’ opinion or feedback.</td>
</tr>
<tr>
<td>Local historical and socio-cultural association</td>
<td>Species should be carefully considered when planting new trees near to existing tree(s) with historical or socio-cultural associated valuable. Planting at locations with significant historical, heritage and socio-cultural values to the neighbourhood, consultation with the community may be needed.</td>
</tr>
<tr>
<td>Interfacing with GMP</td>
<td>Plant species should reference to the GMP themes of plant species palette if the roadside planting works forms part of the district based GMP.</td>
</tr>
<tr>
<td>Planting scheme in the neighbourhood</td>
<td>The existing plant palette and planting scheme in the neighbourhood would influence the choice of species for specific purposes, such as planting alignment and ecological corridor preservation.</td>
</tr>
<tr>
<td>Land use</td>
<td>Planting areas located in areas with higher degree of air pollution should consider species that are rated high in pollution tolerance selection criteria. Planting areas located in formal streets within a main commercial and retail district or in streets with a design theme, due consideration should be given in the number of species variety in the streetscape to maintain the identity and character of the streetscape. Proposed tree species should match with the existing design theme. Consider whether the tree species could fulfil functions of the street, e.g. trees with excessive litter drop should be avoided at footpaths with large pedestrian flows or within on-street parking lots.</td>
</tr>
<tr>
<td>Precinct topography</td>
<td>Consider sloping gradient conditions for the given tree planting area. In general, it is not recommended to plant tree at street with steep sloping gradient (particularly streets in some hilly regions of the Hong Kong Island). Specialist advice should be sought.</td>
</tr>
<tr>
<td>Cycle tracks</td>
<td>In areas, especially new towns or new development areas, where there are cycle...</td>
</tr>
</tbody>
</table>
tracks parallel to carriageways, considerations should be given for tree species which should have overhang of minimum 2.5m on the cycle track to maintain a vertical clearance for the cyclists (5.6.3.1(vii) Vol2 Ch.5 TPDM).

<table>
<thead>
<tr>
<th>Site-Specific Criteria</th>
<th>Design Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical form of planting areas</td>
<td>Tree pit, flush planter and/or kerb planter is more susceptible to soil compaction problem in urban areas than raised planter. Soil compaction is mainly due to pedestrian traffic and activities. If the planting area of a typical street is a tree pit, flush planter and/or kerb planter, the soil compaction criterion should be considered carefully. In urban areas, topsoil pH in flush planter and tree pit is more susceptible to change than in kerb planter or raised planter because these planting areas are subject to direct storm water and surface runoff which contains high content of calcareous materials from construction debris. Therefore, creating more alkaline soil conditions (pH &gt;7.0). Planting species which can perform well in slightly alkaline topsoil condition is required in addition to the general soil pH requirement range (pH 5.5 – 7.0)</td>
</tr>
<tr>
<td>Types of surface paving</td>
<td>For tree pit planting, special care should be given for paver blocks or concreted surfaces surrounding the tree pit where tree root growth will affect the adjacent paving condition as this can cause tripping hazards to pedestrians and increase maintenance required.</td>
</tr>
<tr>
<td>Sunlight preference versus planting location</td>
<td>Trees require sunlight to grow. However, the quality and duration of sunlight that each tree is receiving varies depending on its planting location. For example, for planting areas regularly under shade such as carriageway with heavy shade casted by adjacent high-rise buildings, consideration should be given to species that can perform well under shady conditions. It is suggested that the “Sunlight Preference” listed in Appendix B for each species be verified against its planting location to ensure suitability.</td>
</tr>
<tr>
<td>Other micro-climate considerations</td>
<td>Other micro-climate conditions specific to the location, such as wind tunnel effect, proximity to seaside, etc. should be duly considered.</td>
</tr>
<tr>
<td>Existing Trees</td>
<td>To enhance biodiversity, planting / re-planting shall make reference to the 10-20-30 rule. Surrounding existing tree species will need be examined and reviewed. The urban ULE of existing trees need to be considered to avoid sudden mass tree replacement due to new pests, diseases or the end of their life-cycle.</td>
</tr>
</tbody>
</table>

Table 6-1 – Examples of Site-specific Criteria and Design Considerations
7. Street Tree Selection

7.1 The Selection Process

After confirming the feasibility of street tree planting (Figure 5-3) and identifying the type of street using the flowchart in Figure 5-6, designers can follow one of the following four methods to identity suitable tree species for that street.

**Method 1 - The Street Type Diagrams**

With the known street typology, designer can look up in the corresponding Street Type Diagrams. Based on the "Right Tree, Right Place" principle as discussed in Section 4, 5 and 6, key street tree selection criteria for each of the 14 numbers of street typologies (i.e. Type A1/2 to Type G1/2) are pre-selected and detailed in the Street Type Diagrams.

These diagrams aim to assist designers in the decision-making process to ensure that critical factors related to that particular street type are being considered. Professional advice on site specific factors should also be sought at this point before finalizing the selection. Definitions of the rating (i.e. High, Medium and Low) are detailed in Appendix B – Selection Criteria Rating for Shortlisted Tree Species.

**Method 2 - Summary Table - Suitable Tree Species for each Street Typology (Appendix D)**

Apart from using the Street Type Diagrams, designer can also make reference to the summary table at Appendix D - Suitable Tree Species for each Tree Typology to select suitable trees for that particular street type.

Similarly, professional advice should be sought before finalising the selection.

**Method 3 - Tree Datasheets (Appendix A)**

Designer can also make use of the Tree Datasheets in Appendix A where detailed trees information together with their suitability to the respective street types is provided. Professional advice should be sought before finalising the selection.

**Method 4 - Complementary Tree Selection Software**

This complementary software is designed for the use of designers wish to adjust the pre-selected criteria as defined in the Street Type Diagram to suit site specific requirements after seeking professional advice. A list of suitable tree species will be displayed according to the input selection criteria.

7.2 The Shortlisted Species

Due to the scope of this Study, only 80 species are shortlisted in the Guide. It is not the intention of the Study to limit the number of tree species for future planting to species in the shortlist. Designers are encouraged to use the selection criteria detailed in the Street Type Diagrams as a reference guide to review the suitability of other potential species that would support the long-term goal in achieving a sustainable, healthy and resilient urban forest for Hong Kong.
Street Type A1

Diagram

Street Characteristics

- CMGZ
- Wide planter

Key Selection Criteria

Essential Attributes
- minimal crown management
- high wind tolerance

Valued Attributes
- high roadside pollution tolerance
- medium to high ecological value

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Tree Selection Guide

Street Type A2

Diagram

Street Characteristics

- CMGZ
- Narrow planter

Key Selection Criteria

**Essential Attributes**
- minimal crown management
- high wind tolerance

**Valued Attributes**
- medium to high soil volume tolerance
- high roadside pollution tolerance
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type B1

Diagram

Street Characteristics
- RVGZ
- Wide planter
- No kerbside activity
- No building frontage in building lot

Key Selection Criteria

Essential Attributes

Valued Attributes
- medium to high ecological value

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type B2

Diagram

Street Characteristics

- RVGZ
- Narrow planter
- No kerbside activity
- No building frontage in building lot

Key Selection Criteria

Essential Attributes

Valued Attributes

- medium to high soil volume tolerance
- medium to high ecological value
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type C1

Diagram

Street Characteristics
- RVGZ
- Wide planter
- No kerbside activity
- Building lot with frontage

Key Selection Criteria

Essential Attributes
- high wind tolerance

Valued Attributes
- medium to high ornamental value
- avoid poisonous species
- medium to high pruning tolerance
- medium to large shade cast

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type C2

Diagram

Street Characteristics
- RVGZ
- Narrow planter
- No kerbside activity
- Building lot with frontage

Key Selection Criteria

Essential Attributes
- high wind tolerance

Valued Attributes
- medium to high ornamental value
- medium to high soil volume tolerance
- avoid poisonous species
- medium to high pruning tolerance
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type D1

Diagram

Street Characteristics

• RVGZ
• Wide planter
• No kerbside activity
• Landscape area

Key Selection Criteria

Essential Attributes

Valued Attributes

• high ecological value
• medium to large tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type D2

Diagram

Street Characteristics

- RVGZ
- Narrow planter
- No kerbside activity
- Landscape area

Key Selection Criteria

Essential Attributes

Valued Attributes

- high ecological value
- medium to high soil volume tolerance
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type E1

Diagram

Street Characteristics
- RVGZ
- Wide planter
- Kerbside activity
- No building frontage in building lot

Key Selection Criteria*

Essential Attributes
- high wind tolerance

Valued Attributes
- medium to high root system (manageability)
- medium to high soil compaction tolerance
- medium to high pH of soil (range)
- medium to high pollution tolerance
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type E2

Diagram

Street Characteristics

- RVGZ
- Narrow planter
- Kerbside activity
- No building frontage in building lot

Key Selection Criteria*

Essential Attributes
- high wind tolerance

Valued Attributes
- high root system (manageability)
- medium to high soil volume tolerance
- medium to high soil compaction tolerance
- medium to high pH of soil (range)
- medium to high pollution tolerance
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Tree Selection Guide

Street Type F1

Diagram

Street Characteristics
- RVGZ
- Wide planter
- Kerbside activity
- Building lot with frontage

Key Selection Criteria*

Essential Attributes
- high wind tolerance

Valued Attributes
- medium to high ornamental value
- medium to high pollution tolerance
- medium to high pH of soil (range)
- medium to high root system (manageability)
- medium to high pruning tolerance
- medium to high soil compaction tolerance
- avoid poisonous species
- medium to large shade cast
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type F2

Diagram

Street Characteristics

- RVGZ
- Narrow planter
- Kerbside activity
- Building lot with frontage

Key Selection Criteria*

Essential Attributes
- high wind tolerance

Valued Attributes
- medium to high ornamental value
- medium to high pollution tolerance
- medium to high soil volume tolerance
- medium to high pH of soil (range)
- high root system (manageability)
- medium to high pruning tolerance
- high soil compaction tolerance
- avoid poisonous species
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type G1

Diagram

Street Characteristics

- RVGZ
- Wide planter
- Kerbside activity
- Landscape area

Key Selection Criteria

Essential Attributes
- high wind tolerance

Valued Attributes
- high ecological value
- medium to high soil compaction tolerance
- medium to high pH of soil (range)
- medium to high root system (manageability)
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
Street Type G2

Diagram

Street Characteristics
- RVGZ
- Narrow planter
- Kerbside activity
- Landscape area

Key Selection Criteria*

Essential Attributes
- high wind tolerance

Valued Attributes
- high ecological value
- medium to high soil compaction tolerance
- medium to high pH of soil (range)
- medium to high soil volume tolerance
- high root system (manageability)
- small to medium tree size dimension

* The listed Selection Criteria are key concern for typical street type only. Please consider other site specific criteria and seek advice from relevant professional for selecting appropriate tree species.
8. Life-cycle Maintenance and Management of Trees

8.1 Introduction

Trees are living organisms that naturally grow and age with time. The life spans of trees vary with species and growing conditions. Also, different species have different requirements at each stage of their life-cycle. The life-cycle, by definition, refers to the developmental stages that occur during an organism's life-time. A life-cycle ends when an organism dies.

Trees health conditions will deteriorate with age and change with surroundings. Through proper design and works implementation including provision of adequate planting spaces, selection of quality plant stocks and suitable species, etc., and conducting proper tree care and management, the health of a tree and thus its urban ULE can be increased.

In this Section, the general maintenance and management operations (M&M) for the shortlist of tree species are reviewed. Examples of species that may require special attention are given in Section 8.3. Detailed M&M information for each tree species shortlisted can be found in Appendix A and Appendix C.

8.2 4 Stages of the Tree Life-cycle

The life-cycle of trees is divided into 4 main stages. The 4 stages life-cycle pattern of trees in this Guide is based on literature research and by experience of horticultural and landscape management practitioners to best reflect the current planting practice in urban streets of Hong Kong. It is recommended that professional advice (e.g. qualified arborist) to be sought when identifying the current stage of the tree life-cycle.

A brief description of each life-cycle stage is as below:

1. **Propagation to Seedling** – This life-cycle stage is assumed to be conducted in a tree nursery, where the seed has been germinated or cuttings have begun to grow new roots. Proper planting techniques and practices are to be adopted. At this stage, the tree is weakest and most sensitive to the surrounding environment.

2. **Sapling to Semi-mature** - In general, this is the stage where the tree is most adaptable and able to rapidly establish and grow. A light-standard or standard size tree is usually selected for planting at this stage due to their instant visual effects. Both sizes can be found in the sapling to semi-mature stage of the life-cycle. It is common that the tree specimen at this stage will be selected for transplanting to the final receptor site, i.e. CMGZ or RVGZ. After transplanting, the tree may require 1-2 years to recover from transplant shock before resuming its normal growth, the selection of quality stock is therefore of great importance. Proper maintenance and management is also critical at this stage, especially in the first 2 years after transplanting to ensure proper tree establishment in urban street conditions. 28

3. **Mature** - A mature tree is a fully-established tree that has achieved its full height and crown spread. They play an important role in environmental improvement and ecological enrichment. In general, trees in this stage of the life-cycle have a lower ability to tolerate stress when compared to sapling to semi-mature stage.

---

4. **Senescence** - At this stage, the tree is in the last stage of its life-cycle with declining vigour and will be most vulnerable to environmental and pathogenic stress. In general, a tree with long life-cycle may indicate a longer period of urban ULE. Professional advice should be sought to determine if the tree has reached the end of its urban ULE and whether timely replacement of the tree should be considered.

If fact, life-cycle of trees can be extended beyond senescence by proper use of the felled trees such as recycling them into useful wood products. Further study on this topic is recommended to address the effective disposal of the felled trees.

![Figure 8-1 – The life-cycle of street trees](image)

### 8.3 M&M Operations in 4 Stages of the Life-cycle

A holistic tree care plan can contribute to health and safety of a tree. Although M&M for each tree is dependent on its location, surrounding site environs, past M&M operations and tree species, some general M&M can be applied to most tree species. A summary of the M&M in each of the four stages are given in Table 8-1. Details on each M&M is given on the next page.

29 Useful Life Expectancy (ULE) is an estimate of how long a tree is likely to beneficially contribute and remain in the landscape based on health, amenity, environmental services, cultural contributions to the community that warrants the cost of maintenance. Choosing tree species with long ULE could provide benefits to the community for a longer period with less cost.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shading</strong></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Irrigation</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Weed Control</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Pest / Disease Control</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Tree Protection</strong></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Tree Staking / Guying</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Pruning</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Fertilisation &amp; Soil Aeration</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Tree Inspection and Monitoring &amp; Tree Risk Assessment</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Note: * depends on tree health and state

*Table 8-1 - Maintenance and Management Operations for 4 Life-cycle Stages*
Shading

In general, shade can be provided through shade cloth or panels in the propagation to seedling stage. Shading prevents the build-up of high soil surface temperatures by intercepting solar radiation and insulating seedlings from the heat source. Shading can increase seedling survival. Germinating seed and recently transplanted seedlings need protection from hot sun and heavy rain. On the other hand, shading reduces the amount of water lost by seedlings.

For the other stages, the tree will need to be appropriately planted in the “right place” where there is adequate amount of sunlight for its growth. Shading in urban streets may occur due to surrounding tall buildings, bridges or fly-overs and / or other structures. These may be temporary, semi-permanent or permanent. Detailed examination of the surrounding environment, future development and the tree’s life-cycle is essential when selecting the “right tree”. Proper planting practices on providing adequate growing space for trees should follow GLTMS guidelines on Proper Planting Practices. 30

<table>
<thead>
<tr>
<th>1. Propagation to Seedling</th>
<th>Provide shade under existing trees, shade cloth or panels to increase seedling survival as it keeps seedlings cooler during the heat of the day, reduces moisture loss from soil and also benefit evergreens in winter by reducing desiccation. For shade cloth or panels, the specific shade percentage or density should be adjusted to suit the species. 31 Shade cloth is usually made of loosely woven polyester. The UV filtration factors of 50-60%, 64-75% or 90% are derived from the density of the weave. Cloth with more holes allows more UV light to filter through.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sapling to semi-mature</td>
<td>Each tree species has a specific shade tolerance level and a sunlight requirement level in order to grow properly. The tree species selected for each site should reflect their preferred environmental needs. For example, Podocarpus macrophyllus is shade tolerant, thus more suitable under partially shaded urban conditions. It can be suitably planted on a street with tall structures on both sides.</td>
</tr>
<tr>
<td>3. Mature</td>
<td></td>
</tr>
<tr>
<td>4. Senescence</td>
<td>Once the tree species has been determined, the selected tree specimen should be examined to ensure they are suitable for planting in that environment. This should be done in accordance to the “Select and Plant Good Specimens” promulgated by GLTMS (10/2010). 32</td>
</tr>
<tr>
<td>Other Remarks</td>
<td>As a general rule of thumb, providing shade to common trees species in Hong Kong after seedling phase does not promote the growth of trees.</td>
</tr>
</tbody>
</table>

Irrigation

Irrigation is one of the most essential maintenance operations. The need for irrigation depends on the soil type, climate, planter type and the habit of plant species. Neutral pH water is best suited. Irrigation is best done in the early morning or late afternoon to minimize evaporation. Night-time irrigation is not recommended. Care must be taken to avoid interfering with traffic or blocking pedestrian flow when conducting irrigation. Too much irrigation can just be as harmful as too little irrigation. Signs of overwatering, such as yellowing leaves or stunted growth, and underwatering, such as wilting, should be inspected regularly.

Isolated trees may transpire 2-3 times more than trees planted in large dense groups. If the tree is planted in a single row, more irrigation will generally be required.

A planter at grade may receive more surface run-off than a raised planter, therefore require less irrigation in periods after heavy rain. Similarly, a larger planting area may be able to retain more moisture and therefore, require less irrigation. Understorey planting should not be planted too close to the base of the tree trunk as they will compete with the tree for nutrients. A minimum 150-300mm clearance zone around the tree trunk is recommended. Proper planting practices around the base of the tree should follow GLTMS guidelines on Proper Planting Practices.

| 1. Propagation to Seedling | Good draining soil is usually used if plants are grown in nurseries, since the root system of young trees will not become waterlogged after watering or heavy rain. If planted in clay soils, watering is recommended once every 2-3 weeks after a thorough watering as clay soils hold moisture very well but do not drain well. Watering thoroughly to moisten the root zone can encourage deep rooting because light watering may only encourage surface roots and make the tree more susceptible to drought. |
| 2. Sapling to semi-mature | Watering thoroughly to moisten the root zone can encourage deep rooting and allows the tree to be structurally more stable by growing more anchor roots. Until the tree is established, regular irrigation is required. |
| 3. Mature | Irrigation should be done when the top 15-20cm of the soil is dry and no rain is predicted for a few days. |
| 4. Senescence | As a general rule of thumb, plants should be irrigated before they suffer from chronic drought stress and its attendant side effects on growth, appearance, and susceptibility to insects and diseases. Species which are drought-tolerant, on the other hand, do not need too much watering. Over-irrigating will lead to poor health of the tree and waterlogging problems; Wodyetia bifurcata, for example. |

---

Weed Control

Weeds compete with trees for nutrients, water and light. Weeds also tend to grow faster and are more vigorous than the trees. As such, weed control should be conducted regularly. Once the tree is established, there will be limited resources for the weeds to grow. Therefore, in the later stages of the life-cycle, regular weed control may be unnecessary.

| 1. Propagation to Seedling | There are several ways to minimize weed growth.  
- The planting bed can be prepared up to 4 weeks in advance. The planting bed will be watered and any germinated weeds can be removed prior to planting the seedlings.  
- Mulch can reduce evaporation from soil and lower soil temperature, inhibit weed growth but improve seedling growth and survival. To improve effectiveness, organic mulch is preferable since they can also release organic matter and nutrients into the soil. Apart from weed control, mulching can also prevent soil erosion, evaporation and compaction.  
- Hand-weeding is preferable to better avoid damage to the seedlings. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sapling to semi-mature</td>
<td>Weed control is essential for every tree species for the first 1-2 years after it has been planted in the roadside planter. A vegetation clear zone around each tree should be kept. The zone should be 150mm-300mm or wider for larger trees, which also discourages a moist environment for weed or fungal growth around trunk base/root collar. A thin layer of organic mulching can be added to in this zone under the tree to minimise the possibility of weed growth. Attention to the thickness of the mulch should be made as too much may cause tree rot. Manual removal of weeds in the vegetation clear zone is preferable in order to avoid damaging the root zone.</td>
</tr>
<tr>
<td>3. Mature</td>
<td>Climbers and parasitic plants may be found at the tree canopy or on the trunk. They scramble to the tops of tree and blocking the sunlight for photosynthesis. Their roots compete with trees for moisture and nutrients, stunting or even killing them. Hand weeding is recommended to avoid damage to the tree.</td>
</tr>
<tr>
<td>4. Senescence</td>
<td>The handling of herbicides should follow AFCD (Cap. 133) Pesticides Ordinance on “Pesticide Registration and Control”, General Specification by ASD Section 25, or General Specification (2006) by CEDD Section 3.9. Only herbicides registered in Hong Kong and distributed with a Pesticides License may be used.</td>
</tr>
</tbody>
</table>

---


Pest and Disease Control

Examination on tree health treatment or removal of diseased trees can prevent spread of pests and diseases. Integrated Pest Management (IPM) approach should be undertaken. This is a long-term, ecosystem based strategy to suppress and control the pest population to an acceptable level, through a combination of physical, biological, cultural and chemical methods with the least risk to the environment. IPM is very site-specific. It is based on the identification of pests, accurate measurement of pest populations, assessment of damage and knowledge of available pest management strategies or tactics to make an informed decision.

Signs of pests and diseases and its corresponding treatment should be updated regularly in the maintenance record. If an outbreak occurs, treatment should be immediate. Spraying of pesticides or other chemical products should follow the “Code of Practice for the Safe and Proper Use of Pesticides in Public Areas” jointly issued by AFCD, FEHD and LCSD (Sept. 2014) and “Safe and Proper Use of Pesticides - Turf and Landscape Management” by AFCD (2017, 2nd Ed.). Spraying areas should be temporarily zoned and isolated from pedestrians for safety considerations. Do not apply pesticides when rain is expected within 24 hours, under windy conditions or if the day is expected to reach above 30°C.

1. Propagation to Seedling
   Plant in sterilized / fumigated clean planting beds and selecting only healthy seedlings or propagules. Termites are one of the most common insects recorded in the nursery that can cause serious considerable damage. They eat the roots and stems of many tree species and seedlings are especially vulnerable. Termites can be controlled by regularly using pesticides, applying a thin layer of ash (2-3cm thickness) around the seedlings bed or physically removing the termite queen through the use of plant extracts and chemicals. 41

2. Sapling to semi-mature
   The selected sapling or semi-mature tree should be inspected closely to ensure it is pest and disease free before planting in its final receptor site. After planting, the tree still requires close monitoring for pests and disease to prevent spreading to adjacent trees.

3. Mature
   Regular tree inspection for pests and disease should be conducted to control initial outbreaks and prevent spreading to adjacent trees.

4. Senescence
   At this final stage of the life-cycle, trees spend a majority of their energy just to maintain themselves. Thus, senescent trees are more vulnerable due to their decreased resistance to pest and diseases. 42 Root decay and heart rot are common and can create an ideal habitat for bark beetles and wood boring insects. The affected tree can become a source of a pathogenic inoculum that may affect other nearby healthy trees. 43

Other Remarks
Fuscoporia senex, fungus that cause tree canker, can result in symptoms such

---


Street Tree Selection Guide

as crown defoliation, cavities, cracks and eventually leading to death. In Hong Kong, species such as *Cassia javanica var. indochinensis* are prone to infection\(^44\).

Brown Root Rot Disease caused by fungi pathogen, *Phellinus noxius*, can lead to rapid health and structural deterioration of trees, ultimately to tree failure. This pathogen has a wide host range and reported on more than 200 plant species, representing 59 families. Some of these plant families include, MORACEAE and LAURACEAE. \(^45\) The management approach for this disease is promulgated by GLTMS “Guidelines on Brown Root Rot Disease” (Dec. 2012).\(^46\)

The handling of pesticide should follow AFC (Cap. 133) Pesticides Ordinance on “Pesticide Registration and Control”, General Specification by ASD Section 25, or General Specification (2006) by CEDD Section 3.9. Only pesticide registered in Hong Kong and distributed with a Pesticides License may be used.

---

\(^44\) Greening, Landscape and Tree Management Section, HKSAR Government. (2015). *Note on Common Wood Decay Fungi on Urban Trees of Hong Kong*. Hong Kong: Greening, Landscape and Tree Management Section, Development Bureau.

\(^45\) Ann, P. J., Chang, T. T., & Ko, W. H. (2002). *Phellinus noxius brown root rot of fruit and ornamental trees in Taiwan*. Plant Disease, 86(8), 820-826.

# Tree Protection

Tree protection provides a physical barrier between the tree and the harsh environment. With suitable protection in place, it is possible to enhance and extend the urban ULE of street trees. Tree protection operations should be inspected regularly to ensure they are providing adequate protection and not being detrimental to tree health. Proper tree protection should be carried out in accordance with the following guidelines by GLTMS, “Tree Care During Construction,” “Guidelines on Tree Preservation during Development” (4/2015) and “Design for Tree Protection Zone”.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Propagation to Seedling</td>
<td>Protection from weather conditions such as fierce winds, heavy rains and sunlight is needed as this is a delicate stage in the tree’s life-cycle. Fencing with mesh roof cover (usually doubled up as a cover for shade protection) may also protect against human, wild animals and insects damage. For example, wild animals, such as rodents, can cause serious damage by eating the seedlings. Birds may also eat seedlings that have just germinated.</td>
</tr>
<tr>
<td>2. Sapling to semi-mature</td>
<td>Protection for the tree in urban streets is usually in the form of tree guards, which are used to deter vandalism, urban traffic and provide support in windy conditions. Tree guards need to be large enough to avoid inhibiting the growth of the tree whilst not affecting the pedestrian or traffic flow. Water should be allowed to flow freely into the tree planting area so that the tree can receive irrigation naturally. Regular inspection of the tree guard and the trees are required to ensure they are properly in place and not inhibiting the growth of trees.</td>
</tr>
<tr>
<td>3. Mature</td>
<td>Removal of tree guard is necessary when the tree has reached the mature stage.</td>
</tr>
<tr>
<td>4. Senescence</td>
<td></td>
</tr>
</tbody>
</table>

**Other Remarks**

Trees with buttress roots or large trunk flare, for example *Ficus virens*, should be planted in large planting areas where sufficient space is provided for their growth. Planting in tree pits is not recommended. Meanwhile, *Ficus spp.* are recommended for large planting areas as it would not only provide adequate space, but also allowing aerial roots to grow and reach the ground for stability.
Tree Staking / Guying

Tree stakes and guys should not be installed in areas where they can become a potential tripping hazard or safety concern to the public. Some movement should be allowed so that the tree is better able to adapt to the environment. Regular inspection should be conducted to adjust the staking or guying to benefit tree health. Once the tree can support itself, tree stakes and guys should be removed immediately. Proper tree staking and guying practices should be carried out in accordance to the following guideline by GLTMS, “Staking and Guying of Trees.”

<table>
<thead>
<tr>
<th>Stage Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Propagation to Seedling</td>
<td>Nil</td>
</tr>
<tr>
<td>2. Sapling to semi-mature</td>
<td>Since Hong Kong is located in typhoon-prone zone, sapling and semi-mature street trees are usually supported by stakes. The staking method should avoid damaging the rootball. Connection of the stakes to the tree should be smooth, elastic and non-abrasive. The attachment should not be too high (around one third of the tree height) as this may result in smaller root systems and slender stems. 47 Most street trees require a maximum of 2 years of staking and should be removed after establishment. In windy areas, as many as 3-4 stakes might be required. The general exception to this is palms. Palms, such as <em>Wodyetia bifurcata</em>, may require some staking if planted in high wind areas in the first few years. 48</td>
</tr>
<tr>
<td>3. Mature</td>
<td>Most trees should not require staking during this stage in the life-cycle, with the exception that if the tree is transplanted to the roadside during this stage. Similar to the previous stage of the life-cycle, the staking method should avoid damaging the rootball. In some cases, cabling is used at this stage. Cabling is a way to stabilize a tree, which if otherwise left uncorrected, may shorten its urban ULE due to structural failure. As a tree matures, the weight of the canopy and additional load imposed by rain or wind may increase the stress of the limb. This is especially true if the tree species is prone to included bark or V-shaped crotch, for example, <em>Cassia javanica</em> var. <em>indochinensis</em>. Properly installed cables can aid in redistributing the load and allow the limbs to support each other. Cabling is used as an alternative to large pruning cuts that may otherwise be required to reduce risk of failure. Often, cabling is used to provide stability until the end of the tree urban ULE. The cabling system should be inspected regularly by a tree-care professional and determined if they need to be replaced or readjusted. 49</td>
</tr>
<tr>
<td>4. Senescence</td>
<td>At this stage, the tree may become more vulnerable to limb breakage. A properly installed tree support system reduces the risk of tree failure and extends its lifespan. However, extensive metal frame supporting system is not recommended as it can compromise the ability of the tree to support itself by becoming more dependent on the metal support.</td>
</tr>
</tbody>
</table>

Other Remarks

In some cases, pavement renovation works may directly or indirectly affect tree roots and thus the tree stability. Proper inspection and planning is required before the works to assess whether tree staking is needed. “Guideline on Pavement Renovation Works and Tree Stability” by GLTMS (4/2013) should be followed.

---


Street Tree Selection Guide

Pruning

Pruning involves the selective removal of certain parts of a tree, usually branches or twigs. Commonly done to street trees to improve health, reduce potential public risk, shaping, or ensuring sightlines are not blocked. Proper pruning techniques should refer the “General Guidelines on Tree Pruning” by ETWB, 2007, “Do's and Don'ts in Pruning” and “How to Prune a Tree” by GLTMS. Pruning should be performed by trained personnel and under proper supervision by experienced personnel with expertise in horticulture, arboriculture and tree care.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Pruning Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Propagation to Seedling</td>
<td>Nil</td>
</tr>
<tr>
<td>2. Sapling to semi-mature</td>
<td>Structural pruning is an essential practice for saplings in assisting the young and developing tree to provide a desirable and stable form at maturity. For instance, Plumeria rubra is a tree species which is more likely to develop two or more central leaders or stems, together with the presence of included bark. It is recommended to remove the weaker stems when the tree is still young so that the tree can develop a strong central stem. Some smaller lower branches may be kept temporarily for tree health reasons if they do not block traffic or pedestrian flow. These may eventually be pruned as the tree matures. Hong Kong is located in a typhoon-prone zone and strong winds can be experienced in urban streets. Regular thinning or reduction of tree crowns before the typhoon season begins can ensure less wind load. Thus, the tree can receive less damage during these tropical storms. 50 The percentage of crown thinning or reduction must be adjusted to account for inherent tolerance, age and condition and environmental factors. ANSI A300 Pruning Standards state that “not more that 25 percent of a tree’s foliage should be removed within an annual growing season 51.</td>
</tr>
<tr>
<td>3. Mature</td>
<td>If trained properly in the early stages of growth, a mature tree usually does not need pruning often. However, they should be inspected annually to identify and remove hazards. Usually, during crown cleaning, crown thinning, crown raising or crown reduction a maximum of 25% of the foliage can be removed at any given time. Removal of too much foliage may affect the tree’s health. 52 Proper pruning practices should follow the “Management Guidelines for Mature Trees” by GLTMS (12/2014). Due to the constraints of the street environment, regular pruning for most species is inevitable - including but not limited to removal of structural defects, dead or hazardous branches. The lower branches of tree species (e.g. Polyspora axillaris) may interfere with people or vehicles, or block visibility of signs or street lighting; sometimes their branches may grow into buildings, then pruning of overgrown branches is required. 53</td>
</tr>
<tr>
<td>4. Senescence</td>
<td>Special care is needed when pruning senescence trees. Pruning should only be conducted if there is a safety concern or emergency. As senescent tree energy reserves are small, removing large amounts of wood is not recommended and can hasten tree decline.</td>
</tr>
</tbody>
</table>

If the senescent tree is required to be kept, a qualified professional should inspect the tree for potential or existing hazards and create a long-term pruning plan for the tree if necessary. Crown-reduction may be recommended to reduce height and width of the canopy and encourage new interior growth. Weaker structures should be pruned away to make the tree safe.  

### Other Remarks

Trees that develop aerial root or buttress root should not be planted in tree pits or small planters as this will restrict their growth or cause root girdling.

Pruning of aerial roots may be necessary for some species. *Ficus spp.* (especially *Ficus religiosa*) requires aerial root management in their mature stage due to their “adventitious” growth habit. Aerial root management is important as aerial roots are used for water and nutrient absorption from the surroundings and provides additional lignified support. In this case, aerial roots should be retained unless they become a nuisance. For stonewall trees, pruning may result in wall or tree stability issues. Proper maintenance strategies and operations should refer to “Management Guidelines for Stonewall Trees” by GLTMS (12/2013).

Other types of pruning include formative pruning, crown lifting, crown reduction, crown thinning and crown cleaning. The frequency and type of pruning is dependent on tree species and the street typology. For example, *Pongamia pinnata* may require more frequent pruning because it is a fast-grower. It requires formative pruning in the sapling to semi-mature stage. Crown reduction pruning may be required depending on the site context.

---

54 Roddick, C., & Hanson, B. (2007). *The Tree Care Primer (No. 186)*. Brooklyn Botanic Garden.

Fertilisation & Soil Aeration

Misapplication of fertiliser can be detrimental to a tree’s health. The best time to apply fertilizer is when the tree can use it, i.e. the active growing season. The type of fertiliser, application method and nutrients should be based on the species, life-cycle stage, tree health, soil ability to absorb nutrients and location factors.

Slow-release fertiliser is recommended for most tree species. Application of water-soluble fertiliser is not recommended during the rainy season as the fertiliser can quickly leach away before the tree can absorb the nutrients. Deep root fertilisation is preferable as this method can also reduce soil compaction and provide some degree of soil aeration. Also, it ensures that human activity or pets will not remove the fertiliser accidentally. 56

Prevention is better than cure concerning soil compaction causing insufficient oxygen level reaching tree roots. Methods to prevent soil compaction include the application of mulch, tilling, replacement of soil or planting of complementary vegetation mix. Tree guards can be extended to protect not only the tree but the entire planting area from possible soil compaction due to foot traffic. Signs of soil compaction include hard soil, standing water, poor plant growth and surface crusting. If soil compaction occurs, it can be alleviated through soil aeration. Soil aeration can be done by core aeration, vertical mulching, radial trenching or air excavation. It is recommended to conduct soil aeration operations at the same time when applying fertiliser.

Application of structural elements in pavement, such as structural frames or root cell, is an alternative measure to resolve the soil compaction problem. It also enables an integrated design for planting, paving and underground utilities where the soil volume and quality for tree growth could be maintained without compromising the structural integrity of the footpaths.

1. Propagation to Seedling
   Mulch, a layer of material applied to surface soil, is used to protect seed beds to prevent overheating and rapid drying of surface soil, heavy raindrops, and washing or blowing away of fine soil particles. Fertilizers should be applied to growing nursery plants for needs of nutrient shortage or change of pH57.

2. Sapling to semi-mature
   Compacted soil, generally found in urban roadside planting sites, can greatly reduce the soil ability to hold onto nutrients. Additionally, root loss from tree transplant further limits the uptake of nutrients. Fertilisation at the planting stage may yield minimal results. However, if coupled with soil remediation practices such as raking and harrowing, fertilisation can aid in improving initial tree growth and establishment. A soil test should be performed prior to planting, to determine if there are nutrients deficiency and how the soil can be ameliorated. 58

3. Mature
   As the tree reaches maturity, the need for nitrogen drops as their growth rate naturally slows down. Application of fertilisation can be reduced and a low maintenance level is needed to maintain the tree in healthy condition without excessive vegetative growth. Where possible, it is recommended to conduct a soil test to determine the type of fertiliser is needed. Depending on species, 59


fertilisation can be carried out once every 2-3 years to maintain foliage and vigour.

<table>
<thead>
<tr>
<th>4. Senescence</th>
<th>Nil</th>
</tr>
</thead>
</table>

**Other Remarks**

For evergreen tree species, such as *Podocarpus macrophyllus*, a fertilizer mix that encourages foliar growth (one with a higher ratio of Nitrogen) is recommended to be added during the growing season which is in the early spring. In addition, extra supplements of iron and magnesium are beneficial to its health. Similarly, for flowering tree species, a fertilizer mix that encourages blossoming and flowering (one with higher ratio for Phosphorous) should be applied.

---


# Tree Inspection and Monitoring & Tree Risk Assessment

Proper inspection, monitoring and undertaking of tree risk assessment will minimise risk of tree failure. This should be conducted by qualified professionals for arboricultural works. The information should be gathered across different government departments and centralised for record keeping. Operations requiring emergency response should be done immediately.

<table>
<thead>
<tr>
<th>1. Propagation to Seedling</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sapling to semi-mature</td>
<td>The mortality rate of a sapling or semi-mature tree is the highest in the first 3 years after transplanting to the roadside receptor site. Close monitoring during these first few years is crucial in identifying and mitigating site conditions linked to low rates of survival and establishment rate. 61</td>
</tr>
<tr>
<td>3. Mature</td>
<td>Regular inspection should be carried out at least once a year to identify if there are any changes to the tree condition or surrounding site. Recommendation for treatment should be identified and carried out in accordance with the Guidelines for Tree Risk Assessment and Management Arrangement by GLTMS, DevB. 62</td>
</tr>
<tr>
<td>4. Senescence</td>
<td>Close tree monitoring and inspection is recommended to be conducted by qualified professionals for arboricultural works. Injuries and decay that happened in the earlier stages of the life-cycle, can become more problematic as the tree reaches senescence. Senescent trees become less effective in compartmentalization, which leads to the spread of infection. Likewise, as the tree becomes more vulnerable, close inspection for pests and diseases should be conducted to prevent spreading. Depending on the tree species, detailed annual or half-yearly tree risk assessment may be necessary. For example, <em>Plumeria rubra</em> may require half-yearly assessments as it has relatively brittle branches and is a fast-grower. Some indicators may not be clearly visible and specialized instruments, e.g. resistographs, should be used to determine the amount of decay or other defects in the wood.</td>
</tr>
<tr>
<td>Other Remarks</td>
<td>The purpose of tree risk assessment is to identify potential tree risks and carry out mitigation measures in a timely manner to reduce risk. Tree management departments are required to carry out tree risk assessment in accordance with the “Guidelines for Tree Risk Assessment and Management Arrangement” promulgated by GLTMS (currently the November 2015 edition or the latest edition after).</td>
</tr>
</tbody>
</table>

---


The Guide aims to promote an ecologically sustainable streetscape and vegetation diversity for a healthy urban forest. Ecologically sustainable refers to the biosphere to meet the needs of this current generation without hindering the needs of the future generation. Although this Guide mainly focuses on selecting the “right tree” for the “right place”, having vegetation underneath the tree canopy is beneficial to the health and longevity of the urban forests, organisms and environment, ensuring the quality of the streetscape will be maintained or improved for future generations. The vegetation cover that is compatible with trees and other plant species to form a community is known as the Complementary Vegetation Community Mix (CVCM).

Vegetation underneath tree canopy can be arranged roughly in 3 layers according to the height and growth habit. These 3 layers are – tree layer, shrub layer and herbaceous / groundcover layer (Figure 9-1). The grouping of different vegetation layers and species which share a common environment and interact with inhabiting plants, animals, and the physical environment, is called “plant community”.[63] Similarly, an animal community is the association of two or more different animal species occupying the same geographical area in a particular time. Plant communities can affect the different animal communities that inhabit in that particular area or enlarge existing urban habitats. To enhance street ecology and available habitats, the CVCM should be able to simulate natural habitats for the target animal community where appropriate.

---

9.2 Urban Ecology

For the purpose of this Study, urban ecology refers to the co-existence of different urban vegetation in promoting the overall health of the urban soft landscape environment such as soil quality, floristic health, and increased contributions of fauna ecology. Improvements in this ecological cycle contribute towards the overall improvements to urban microclimates, tree safety, street comfort, improved visual amenity, and perceptions of a more liveable city.

Planting areas providing a continuous tree canopies with rich understories plants and interconnected with other vegetation can create an ecological corridor for the migration and habitation of wildlife. Connecting different areas of food and shelter can create larger living spaces and complex food webs that benefit wildlife higher up the food chain. (Figure 9-2). Recent studies found that the urban bird species richness directly correlates to heterogeneity of vegetation heights, which means the height diversity between layers of tree, shrub, and groundcover height. Therefore, besides the tree layers, evergreen shrubs should also be planted underneath deciduous trees to provide protection as well as maintaining aesthetic value during winter.

Figure 9-2 – Examples of Hong Kong Urban Wildlife Food Web in Different Vegetation Layers


9.3 Benefits of CVCM

Individual plant species have a natural disposition to some species and not to others. This ability of different species to co-exist creates the vegetation communities commonly found in natural landscapes, as well as the destruction of other plant species and vegetation communities when in conflict. In an urban setting where species are individually selected and then combined to make a larger planting area, it is essential to consider the entire planting plan as a holistic vegetation community. Benefits include:

- A healthy plant ecosystem
- Reduced maintenance
- Reduced weed infestation
- Improved soil quality

The planting of CVCM should take into account the vegetation clear zone as promulgated in the Proper Planting Practice “Keep Sufficient Space Clear of Vegetation at the Base of Trees” (08/2011) by the GLTM Section. This space is recommended to be filled with organic mulch to discourage weeds and decrease possible soil compaction and to ensure the complementary vegetation will not compete with the tree for nutrients. Professional advice from Landscape Architects should be sought during the design process to identify suitable CVCM for the planting area.

9.4 Selection Principles and Considerations

The main principles and considerations are as below. Examples of CVCM species with high ecological value in providing food source to the wildlife and less commonly used species but with long-term propagation potential is shown in Appendix E for reference.

- **Nature Knows Best**: vegetation communities found in natural landscapes make the best reference when selecting and composing species mix for urban landscapes. The species within vegetation communities are complementary because they have evolved to co-exist.

- **Near Enough is Actually Good Enough**: the CVCM does not require a literal species-to-species match with existing vegetation communities. Similar species of species within the same genus are also suitable. If in doubt, consult a horticulturalist or make advice from the AFCD herbarium.

- **Aim for Complexity**: increasing the vegetation diversity will always result in the natural selection of CVCM. If all else fails, aim for complexity by making reference to the 10-20-30 rule for planting diversity, especially in the shrub and herbaceous layers. Professional advice is recommended in order to design and plan for a visually appealing streetscape with a high biodiversity that requires minimal maintenance. (*Figure 9.3 to 9.7*)

- **Propagation Potential**: species that can be propagated is an indication of the plant’s vigour, and will also improve commercial interest and supply.

- **Urban Compliance**: species that would comply with the visibility and sightline requirements through routine maintenance.
Figure 9.3 10-20-30 Rule for Planting Diversity
Figure 9.4 Examples to Showcase Planting Rhythm and Diversity (Plan)

Feature trees to anchor street corners and provide a visual reference to city blocks along major streets. Larger corner trees also maximise shade at intersections where people congregate. Functionally, these trees can be vetted to tree pits as soak wells — connecting to adjoining drainage infrastructure.

Species B and C to create urban rhythm along the streetscape and maintain visual continuity.

Complementary Vegetation Community Mix (CvCM)
Figure 9.5 Examples to Showcase Planting Rhythm and Diversity (Section)

Note: The planting design should consider each street in its entirety, with the relationship between species' form defining the vertical rhythm of the streetscape. Depending on street length and type, considerations should also be given to seasonal colours and foliage texture, contrast and leaf shape and size across the vegetation assemblage from tree, shrub, to herbaceous plants.

1. Continuous tree canopy at top layer
2. Understorey planting at lower layer
As a good horticultural practice, it is recommended to provide a low groundcover zone around tree base to facilitate tree maintenance and inspection.

Understorey vegetation following the 10-20-30 rule of planting diversity. Different layers and forms are recommended to enhance urban ecology. (see Figure 9.7)

Plant trees away from road kerb. (Refers to HyD standard drawings)

Figure 9.6  Roadside Planting - Good Practice
Figure 9-7 – Different Layers and Forms of Understorey Vegetation

**Not recommended**
(Simple Structure & Single Layer)

**Recommended**

Higher shrubs at roadside to block and filter localised vehicular pollution.

Consider species with dense foliage with small leaf size. Can also consider rain garden species so that roadside planting act as bioswales.

Lower shrubs adjoining footpath to maximise visual perspective and interest. Planting strip can also be bermed to create same effect.

**Recommended**

Lower shrubs at roadside to maximise visual perspective and interest from car. Planting strip can also be bermed to create same effect.

Higher shrubs adjoining footpath to better define barrier planting, yet at the same time engage a more tactile streetscape, especially for children. Ideal for areas with wider footpath.
Recommended

Ideal for median planting, a central height accentuates the rhythm of a continuous planting strip. Shrubs can be very diverse so long as form and size are similar at maturity.

Figure 9-7 – Different Layers and Forms of Understorey Vegetation (continued)
10. Conclusion

As cities continue to rapidly urbanise and densify, street trees have become a focal point in our community’s aspirations to maximise ecological benefits and our connection with nature. Having one of the most compact and dense urban environments in the world\(^{66}\), Hong Kong is particularly challenged to maximise street tree planting in the face of progressive development, unpredictable climate, and ageing street tree assets. Indeed, the effects of climate change in Hong Kong can already be seen by the increased frequency of extreme hot days and rainfall\(^{67}\), and some of our ageing trees planted decades ago may not be able to adapt to these changes. Increasing temperatures due to urban heat and climate change are proven a threat to some tree species in other economies\(^{68}\). Hong Kong needs to be prepared to ensure our urban forest is resilient, adaptable and sustainable to meet these changes.

This Guide proposes that roadside trees should be selected and planted under the principle of, “Right Tree, Right Place” to create an urban forest that can tackle the challenges brought about by future changes. To further future-proof this valuable asset, the 10-20-30 rule of plant diversity should be considered for wide application in new planting and replacement planting as far as practicable.

By increasing tree species diversity supported by CVM, the on-ground outcomes of the Guide can contribute toward the reduction of risks associated with inadequate upstream life-cycle planning and design of street tree assets. Adoption of species diversity in urban city planting has been practised by international cities, with emerging landscape design re-imagining the traditional streetscape environment. The preparation and development of district-wide urban forest precincts or master plans are also recommended to better articulate landscape design themes, and more importantly to provide territory-wide cohesion of overall landscape strategy. The potential for design innovation is significant, as complexity demands creative solutions. This Guide offers designers in Hong Kong the unique opportunity to be at the forefront of streetscape design for compact and linear landscapes.

Professional advice from Landscape Architects, qualified Arborists, horticulturalists, and other relevant disciplines should be sought for further investigation on the suitability of species relative to the street type and design, in particular replacement planting of ageing tree assets. Proper hard and soft streetscape design with professional input from Landscape Architects is recommended across all work stages. This include, but not limited to, the allocation of sufficient planting space at the initial planning stage, proper designing of CVM and supporting hard landscape elements such as tree pit details, structural soils or cells, drainage and irrigation requirements, specification of suitable planting media etc. at design stage, and selection of quality nursery stocks, and supervision of planting works to ensure proper workmanship etc. at implementation stage.

To consolidate a robust life-cycle inventory, the development of a holistic urban forest database with tree planting date, health condition, form, size and urban ULE, etc is strongly recommended to ensure continual assessment and review of tree species performance within different street types. Further studies into the propagation, procurement, growth characteristics and performance of tree and CVM species, especially

---


native species are also recommended. With more experience gained in application and trial planting of the tree species in the shortlist, it will inform and enrich the updating of the species list in the Guide to maintain continual improvement of Hong Kong’s urban forest stock. Supporting studies to modernise planting conditions include tree pit details, specification options of urban soils, drainage and planting practices will be required to minimise downstream tree management and maintenance risks. Tree planting along carriageways and pavements in the urban areas form an effective landscaped connector. However, other suitable locations for urban forestry planting not included in this Guide, such as man-made slopes, public parks, green spaces within government properties, etc., are equally as important. Apart from roadside planting, to explore planting opportunities at project planning stage to connect to the surrounding areas into a “Green and Blue System” network with eco-corridors as envisioned under the Hong Kong 2030+ is encouraged to multiply the landscape benefits.

We engage with the street every day, and given our streetscape can make up as much as 75% of our outdoor environment, its resilience, comfort, and safety greatly impact our perception of a quality city where the community can stay and enjoy. The importance and benefits of a healthy and resilient urban forest is an investment that should be more widely recognised. With the broader application of this Guide, it is hope that this investment in our urban forest will safeguard these valuable tree assets for passing on to our future generations.
References


Street Tree Selection Guide


Street Tree Selection Guide


Street Tree Selection Guide


Street Tree Selection Guide


薛聰賢 (2001). 景觀植物實用圖鑑 第 7 輯 - 精選 木本花卉 196 種. 北京: 北京科學技術出版社


呂福原、歐辰雄 (1997). 臺灣樹木解說. 臺北: 行政院農業委員會

周琳潔 (2010). 華南鄉土樹種與應用. 北京: 中國建築工業出版
Appendix A. Tree Datasheets
Albizia julibrissin

**General Information**

- **Native/Exotic**: Exotic
- **Evergreen/Deciduous**: Deciduous
- **Partial Shade/Full Sun**: Partial Shade
- **Family**: MIMOSACEAE
- **Heat Tolerance**: Moderate

**Special Properties**

- Pink fragrant flowers
- Symbiotic relationship with nitrogen-fixing soil bacteria

**Ecological Value**

- Ornamental

**Heat Tolerance**: Moderate

**Recommended Street Types**

- A
- B
- C
- D
- E
- F
- G

**Tolerance**

- **Drought**: Moderate
- **Waterlogging**: High
- **Roadside Pollution**: High
- **Pest & Disease Resistance**: High
- **Pruning**: High
- **Root System**: Sensitive to wilt
- **Installation of root barriers or guides is recommended**

**Soil Volume**

- **Adaptability**: Large
- **Soil Volume**: Large
- **pH of Soil**: Moderate

**Recommended Tree Characteristics**

- **Fruiting, Flowering and Tree Characteristics** shown in shade
- **Special Maintenance Requirements**
- **Distinctive Attribute or Quality of the Tree**
- **Period in which a tree normally produce flowers/fruit/foliage interest in Hong Kong are shown in shade**
- **Life Cycle of a tree if planted in urban Hong Kong streets**
- **Approximate tree size, form and root system at mature stage**
- **Special maintenance requirements unique to this tree**

**How to Read the Tree Datasheets**

- Refer to Section 5 for Street Typology Classification
- General information of tree characteristics shown in shade
- Distinctive attribute or quality of the tree
- Period in which a tree normally produce flowers/fruit/foliage interest in Hong Kong are shown in shade
- Approximate tree size, form and root system at mature stage
- Approximate starting time for each life cycle of a tree if planted in urban Hong Kong streets. Propagation to seedling stage is assumed to take place in the nursery.
- Special maintenance requirements unique to this tree

**Appendix A - Tree Datasheets**

- How to read the tree datasheets
- Refer to Appendix B for detailed explanation of the ratings
**Adenanthera microsperma**

海紅豆, 孔雀豆

### General Information

**Family:** MIMOSACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Attractive red fruits; Symbiotic relationship with nitrogen-fixing soil bacteria; Flower nectar attractive to wildlife

### Tolerance

**Drought**
- Low
- Moderate
- High

**Waterlogging**
- Low
- Moderate
- High

**Wind**
- Low
- Moderate
- High

**Soil Compaction**
- Low
- Moderate
- High

**Root System**
- Aggressive
- Moderate
- Manageable

### Special Maintenance Requirements

- Shrubby form may require formative pruning
- Mature trees may have slightly buttressed trunk
- Entire plant is poisonous

### Life-cycle Pattern

- 1-4 yrs
- 5-8 yrs
- 9-50 yrs
- 51-60 yrs
- 12-15m
- 15-20m
- 51-60yrs

### Feature

- Ecological Value
- Ornamental
- Shade Cast

### Adaptability

- Large
- Medium
- Small

### pH of Soil

- Low
- Moderate
- High

### Recommended Street Types

A 1 2
B 1 2
C 1 2
D 1 2
E 1 2
F 1 2
G 1 2

### Fruiting, Flowering and Tree Characteristics

- **Fruit**
- **Flower**
- **Foliage Change**

- **Maintenance:**
  - Propagation to Seedling
  - Sapling to Semi-mature
  - Mature
  - Senescence

### Life-span Pattern (Years)

- 1-4 years
- 5-8 years
- 9-50 years
- 51-60 years

### Special Properties:

- Attractive red fruits; Symbiotic relationship with nitrogen-fixing soil bacteria; Flower nectar attractive to wildlife
**Arenga pinnata**

砂糖椰子, 恆榔

**Special Properties:** Fruits attractive to wildlife; Fruiting period should be 2-3 years after flowering period

**Family:** ARECACEAE  
**Heat Tolerance:** Moderate

**Recommended Street Types**

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>B2</td>
<td>C1</td>
<td>D2</td>
<td>E1</td>
<td>F2</td>
</tr>
</tbody>
</table>

**General Information**

- **Tolerance**
  - Drought: Moderate – High
  - Roadside Pollution: Low – High
  - Pest & Disease Resistance: Low – High
  - Pruning: N/A
  - Soil Compaction: Low – High
  - Root System: Aggressive – Manageable
  - Soil Volume: Large – Small
  - pH of Soil: H – L

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

- No Special Maintenance Requirements

**Life-cycle Pattern (Years):**
- Sapling to Seedling
- 1-3 yrs
- Propagation to Seedling
- 16-40 yrs
- Senescence
- 41-50 yrs
- Mature
- 3-5 m
- Fruiting
- 4-15 yrs
- Flower
- 15-20 m
- Foliage Change
- 3-5 yrs
Albizia julibrissin

**General Information**

- **Family:** MIMOSACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Pink fragrant flowers; Symbiotic relationship with nitrogen-fixing soil bacteria

**Propagation to Seedling**
- Sapling to Semi-mature
- Mature
- Senescence

**Fruiting, Flowering and Tree Characteristics**

- **Tree Bark**
- **Fruit**
- **Flower**
- **Foliage Change**

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Installation of root barriers or guides is recommended

**Tolerance**

<table>
<thead>
<tr>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Soil Compaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waterlogging</th>
<th>Pest &amp; Disease Resistance</th>
<th>Root System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Aggressive</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>Manageable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wind</th>
<th>Pruning</th>
<th>Soil Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Large</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>Small</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>pH of Soil</th>
<th>Adaptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>L</td>
</tr>
</tbody>
</table>

**Recommended Street Types**

- A
- B
- C
- D
- E
- F
- G
**Aporosa dioica**
銀柴, 大沙葉

### General Information

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Family:** EUPHORBIACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Fruits attractive to wildlife; Larval food plant of butterflies

### Life-cycle Pattern (Years)
- Sapling to Semi-mature: 4-6m  
- Mature: 7-10m  
- Senescence: 1-4 yrs  
- 5-8 yrs  
- 9-50 yrs  
- 51-60 yrs

### Tolerance

**Drought**
- Low  
- Moderate  
- High

**Roadside Pollution**
- Low  
- Moderate  
- High

**Waterlogging**
- Low  
- Moderate  
- High

**Wind**
- Low  
- Moderate  
- High

**Pest & Disease Resistance**
- Low  
- Moderate  
- High

**Pruning**
- Low  
- Moderate  
- High

**Root System**
- Aggressive
- Moderate
- Manageable

**Soil Compaction**
- Low
- Moderate
- High

**Soil Volume**
- Large
- Medium
- Small

**pH of Soil**
- High
- Medium
- Low

### Special Properties:
Fruits attractive to wildlife; Larval food plant of butterflies.
**Bixa orellana**

**Recommended Street Types**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**General Information**

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Family:** BIXACEAE  
**Heat Tolerance:** High

**Special Properties:** Pink flowers; Red fruit; Flower nectar attractive to wildlife

---

**Fruiting, Flowering and Tree Characteristics**

- Fruits
- Flower
- Foliage Change

**Feature**

- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**

- Moderate maintenance manageability

---

**Tolerance**

**Drought**

- Low
- Moderate
- High

**Waterlogging**

- Low
- Moderate
- High

**Wind**

- Low
- Moderate
- High

**Roadside Pollution**

- Low
- Moderate
- High

**Pest & Disease Resistance**

- Low
- Moderate
- High

**Soil Compaction**

- Low
- Moderate
- High

**Root System**

- Aggressive
- Moderate
- Manageable

**Soil Volume**

- Large
- Medium
- Small

**pH of Soil**

- H
- M
- L

Adaptability
Brachychiton acerifolius
槭葉蘋婆

General Information
- Family: STERCULIACEAE
- Heat Tolerance: Moderate
- Special Properties: Red bell-shaped flowers; Flower nectar attractive to wildlife

Tolerance
- Drought: Low
- Roadside Pollution: Low
- Pest & Disease Resistance: Low
- Soil Compaction: Low
- Waterlogging: Low
- Wind: Low
- Pruning: Low

Recommended Street Types
- A
- B
- C
- D
- E
- F
- G

Special Maintenance Requirements
- Hairs inside the seedpods may cause skin irritation
- Tree crown may require annual maintenance
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

Fruiting, Flowering and Tree Characteristics

Flowers
- Fruit
- Flower
- Foliage Change

Li f e-cycle Pattern (Years)
- Sapling to Semi-mature: 1-3yrs
- Senescence: 4-8yrs
- Mature: 9-70yrs
- Senescence: 71-80yrs
- Shading: 6-8m
- Ecological Value: Ornamental

Feature
- Ecological Value: H
- Ornamental: H
- Shade Cast: X

Special Properties:
- Red bell-shaped flowers; Flower nectar attractive to wildlife
- Heat Tolerance: Moderate

Soil Volume
- pH of Soil
- Adaptability: Large
- Medium
- Small

Family: STERCULIACEAE

20181508
**Bridelia tomentosa**

**General Information**

- **Family:** EUPHORBIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits, seeds and leaves attractive to wildlife

**Fruiting, Flowering and Tree Characteristics**

- **Flowers**
- **Fruits**
- **Foliage Change**

**Life-cycle Pattern (Years)**

- 1-3 yrs
- 4-8 yrs
- 9-40 yrs
- 41-50 yrs

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - High

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Shrubby form may require formative pruning
- Moderate maintenance manageability

**Heat Tolerance:** Moderate
Caesalpinia ferrea

General Information

- **Family:** CAESALPINIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Ornamental tree bark; Symbiotic relationship with nitrogen-fixing soil bacteria

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Formative pruning to prevent narrow crotch angles
- Tree crown may require annual maintenance
- Installation of root barriers or guides is recommended

**Life-cycle Pattern (Years)**

- 1-4 yrs
- 5-10 yrs
- 11-50 yrs
- 51-60 yrs

**Soil Volume**

- Adaptable: Large, Medium, Small

**pH of Soil**

- Adaptability: High, Moderate, Manageable

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Tree Bark**
  - Formative pruning to prevent narrow crotch angles
  - Tree crown may require annual maintenance
  - Installation of root barriers or guides is recommended
**Carallia brachiata**

**General Information**

- **Family:** RHIZOPHORACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife

**Tolerance**

- **Drought:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Roadside Pollution:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Pest & Disease Resistance:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Pruning:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Waterlogging:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Wind:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Soil Compaction:**
  - Low: Manageable
  - Moderate: Manageable
  - High: Manageable

- **Root System:**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume:**
  - Large
  - Medium
  - Small

- **pH of Soil:**
  - Low
  - Medium
  - High

**Feature**

- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**

- No Special Maintenance Requirements
Cassia x nealiae
彩虹雨樹

**General Information**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Special Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td>- Crown thinning may be needed to reduce wind resistance</td>
</tr>
<tr>
<td>Ornamental</td>
<td>- Tree crown may require annual maintenance</td>
</tr>
<tr>
<td>Shade Cast</td>
<td>- Drooping branches may require regular pruning</td>
</tr>
<tr>
<td></td>
<td>- Installation of root barriers or guides is recommended</td>
</tr>
</tbody>
</table>

**Heat Tolerance:** Moderate

**Special Properties:** Red and white flowers; Flower nectar attractive to wildlife

**Family:** CAESALPINIACEAE

**Adaptability:** Large

**Recommended Street Types:** A2B1C1D1E1F1G1

**Fruiting, Flowering and Tree Characteristics**

- **Fruit**
- **Flower**
- **Foliage Change**

**Soil Volume**

- **pH of Soil**
- **Soil Compaction**
- **Root System**

**Life-cycle Pattern (Years):**

- **1-4yrs**
- **5-8yrs**
- **9-50yrs**
- **51-60yrs**

**Crown thinning may be needed to reduce wind resistance**

**Installation of root barriers or guides is recommended**
**Cassia javanica var. indochinensis** 節果決明

### General Information

- **Family:** CAESALPINIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Pink and white flowers; Larval food plant of butterflies

### Fruiting, Flowering and Tree Characteristics

- **Flowers**
- **Fruit**
- **Foliage Change**

#### Life-cycle Pattern (Years)

- Sapling to Seedling
- Propagation to Seedling
- Shade Cast
- Ecological Value

#### Special Maintenance Requirements

- Drooping branches may require regular pruning
- Tree crown may require annual maintenance
- Installation of root barriers or guides is recommended

### Tolerance

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - Low
  - Moderate
  - High

- **Adaptability**
  - Large
  - Medium
  - Small
**Celtis timorensis**

假玉桂,樟葉朴

---

### General Information

- **Family:** ULMACEAE
- **Heat Tolerance:** High
- **Special Properties:** Fruits attractive to wildlife

### Tolerance

- **Drought:**
  - Low
  - Moderate
  - High

- **Waterlogging:**
  - Low
  - Moderate
  - High

- **Wind:**
  - Low
  - Moderate
  - High

- **Roadside Pollution:**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High

- **Pruning:**
  - Low
  - Moderate
  - High

- **Soil Compaction:**
  - Low
  - Moderate
  - High

- **Root System:**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume:**
  - Large
  - Medium
  - Small

- **pH of Soil:**
  - High
  - Moderate
  - Low

---

### Special Maintenance Requirements

- Ecological Value: High
- Ornamental: High
- Shade Cast: Moderate

---

### Feature

- Malodourous wood and tree sap

---

### Life-cycle Pattern (Years)

- 1-4yrs
- 5-8yrs
- 9-50yrs
- 51-60yrs

---

### Fruiting, Flowering and Tree Characteristics

- Propagation to Seedling
- Sapling to Semi-mature
- Mature
- Senescence

---

### Adaptability

- Large
- Medium
- Small

---

### Soil Volume

- Low
- Moderate
- High

---

### pH of Soil

- High
- Moderate
- Low

---

### Comprehension

- **Celtis timorensis** is a species known for its attractive fruits that are beneficial to wildlife.

---

### Conclusion

- This plant is recommended for street types B2 and C2 due to its high tolerance to drought and moderate tolerance to roadside pollution.

---

### Further Reading

For more detailed information on specific management practices and ecological significance, refer to the relevant sections within this document or consult a specialized horticultural guide.
**Choerospondias axillaris**

**General Information**

- **Family**: ANACARDIACEAE
- **Heat Tolerance**: Moderate
- **Special Properties**:
  - Fibrous tree bark
  - Fruits attractive to wildlife

**Tolerance**

- **Drought**: Low, Moderate, High
- **Roadside Pollution**: Low, Moderate, High
- **Pest & Disease Resistance**: Low, Moderate, High
- **Pruning**: Low, Moderate, High
- **Soil Compaction**: Low, Moderate, High
- **Root System**: Aggressive, Moderate, Manageable
- **Soil Volume**: Large, Medium, Small
- **pH of Soil**: Adaptability

**Feature**

- **Ecological Value**: High
- **Ornamental**: High
- **Shade Cast**: High

**Special Maintenance Requirements**

- Tree crown may require annual maintenance
- Moderate maintenance manageability

**Life-cycle Pattern (Years)**

1-3 yrs, 4-8 yrs, 9-60 yrs, 61-80 yrs

**Fruiting, Flowering and Tree Characteristics**

- **Flowers**
- **Fruits**
- **Foliage Change**
- **Heat Tolerance**: Moderate
**Chukrasia tabularis**

**General Information**

- **Family:** MELIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Roosting site

**Features**

- **Ecological Value:** High
- **Ornamental:** High
- **Shade Cast:** High

**Special Maintenance Requirements**

- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

**Tolerance**

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Adaptability
Cinnamomum parthenoxylon

General Information

Family: LAURACEAE  Heat Tolerance: Moderate
Special Properties: Fruits are attractive to wildlife

Feature

Ecological Value: High
Ornamental: High
Shade Cast: High

Special Maintenance Requirements
- No Special Maintenance Requirements

Tolerance

Drought
- Low
- Moderate
- High

Waterlogging
- Low
- Moderate
- High

Wind
- Low
- Moderate
- High

Roadside Pollution
- Low
- Moderate
- High

Pest & Disease Resistance
- Low
- Moderate
- High

Pruning
- Low
- Moderate
- High

Soil Compaction
- Low
- Moderate
- High

Root System
- Aggressive
- Moderate
- Manageable

Soil Volume
- Large
- Medium
- Small

pH of Soil
- High
- Moderate
- Adaptability
**Cleistocalyx nervosum**

Water

---

**General Information**

- **Family:** MYRTACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits, seeds and flower nectar are attractive to wildlife

---

**Tolerance**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Pest &amp; Disease Resistance</th>
<th>Pruning</th>
<th>Root System</th>
<th>Soil Compaction</th>
<th>Soil Volume</th>
<th>pH of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Aggressive</td>
<td>Low</td>
<td>Large</td>
<td>Large</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Manageable</td>
<td>High</td>
<td>Small</td>
<td>Small</td>
</tr>
</tbody>
</table>

---

**Life-cycle Pattern (Years)**

- Sapling to Semi-mature: 1-4 yrs
- Mature: 5-8 yrs
- Senescence: 9-50 yrs
- Propagation to Seedling: 51-60 yrs

**Ecological Value**

Ornamental

---

**Ornamental Characteristics**

- **Flowering:** November - December
- **Fruiting:** December - January
- **Leaf Change:** March - April
- **Shade Cast:** Moderate
- **Adaptability:** Large
- **Soil Volume:** Medium
- **pH of Soil:** Medium
- **Heat Tolerance:** Moderate
**Cordia dichotoma**

**General Information**

- **Family:** BORAGINACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits, seeds and flower nectar are attractive to wildlife

**Fruiting, Flowering and Tree Characteristics**

- **Life-cycle Pattern (Years):**
  - Sapling to Semi-mature: 1-3yrs
  - Senescence: 4-10yrs
  - Mature: 11-40yrs
  - Propagation to Seedling: 41-60yrs
- **Height:** 3-5m
- **Width:** 5-8m

**Ecological Value**

- Ornamental

**Feature Special Maintenance Requirements**

- Tree crown may require annual maintenance
- Moderate maintenance manageability

**Tolerance**

- **Drought:**
  - Low
  - Moderate
  - High
- **Waterlogging:**
  - Low
  - Moderate
  - High
- **Wind:**
  - Low
  - Moderate
  - High
- **Roadside Pollution:**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High
- **Pruning:**
  - Low
  - Moderate
  - High
- **Root System:**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume:**
  - Large
  - Medium
  - Small
- **pH of Soil:**
  - High
  - Medium
  - Low

**Additional Information**

- Photos provided by AFCD
- All photos provided by AFCD
Crateva trifoliata
鈍葉魚木

**General Information**

- **Family:** CAPPARACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** White and yellow flowers; Fruits attractive to wildlife

**Feature Special Maintenance Requirements**
- No Special Maintenance Requirements

**Tolerance**

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Adaptability

**Recommended Street Types**

- A1, B1, C1, D1, E1, F1, G1
**Crateva unilocularis**

**General Information**
- **Family**: CAPPARACEAE
- **Heat Tolerance**: Moderate
- **Special Properties**: White and yellow flowers; Fruits attractive to wildlife

**Fruiting, Flowering and Tree Characteristics**

**Feature**
- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**
- No Special Maintenance Requirements

**Tolerance**
- **Drought**: Low → Moderate → High
- **Waterlogging**: Low → Moderate → High
- **Wind**: Low → Moderate → High
- **Roadside Pollution**: Low → Moderate → High
- **Pest & Disease Resistance**: Low → Moderate → High
- **Pruning**: Low → Moderate → High
- **Soil Compaction**: Low → Moderate → High
- **Root System**: Aggressive → Moderate → Manageable
- **Soil Volume**: Large → Medium → Small
- **pH of Soil**: H/m/L
**Cratoxylum cochinchinense**

**Family:** CLUSIACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:**  
Flowers nectar attractive to wildlife; Larval food plant for butterflies

---

### General Information

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Tolerance

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Low, Moderate, High

---

### Special Maintenance Requirements

- Shrubby form may require formative pruning  
- Moderate maintenance manageability

---

### Life-cycle Pattern (Years)

- 1-4yrs
- 5-10yrs
- 11-50yrs
- 51-60yrs

---

**Heat Tolerance:** Moderate  
**Soil Volume:** Medium  
**pH of Soil:** Low
Dalbergia assamica

General Information

- **Family:** Fabaceae
- **Heat Tolerance:** Moderate
- **Special Properties:** Good host tree for Laccifer Lacca; Symbiotic relationship with nitrogen-fixing soil bacteria; Flowers attractive to wildlife

Fruiting, Flowering and Tree Characteristics

- **Life-cycle Pattern:** 1-3 yrs Sapling to Seedling, 4-10 yrs Propagation to Seedling, 11-70 yrs Mature, 71-80 yrs Senescence
- **Shade Cast:** Moderate
- **Ecological Value:** Ornamental
- **Adaptability:** Medium
- **Heat Tolerance:** Moderate
- **No Special Maintenance Requirements**

Tolerance

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** H, M, L

Feature Special Maintenance Requirements

- Ecological Value: High
- Ornamental: High
- Shade Cast: Moderate

Recommended Street Types

- A
- B
- C
- D
- E
- F
- G

Special Properties:

- Good host tree for Laccifer Lacca;
- Symbiotic relationship with nitrogen-fixing soil bacteria;
- Flowers attractive to wildlife

Dalbergia assamica

南嶺黃檀

Family: FABACEAE

Heat Tolerance: Moderate

Special Properties: Good host tree for Laccifer Lacca; Symbiotic relationship with nitrogen-fixing soil bacteria; Flowers attractive to wildlife
**Diospyros morrisiana**

### General Information

**Family:** EBENACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Fruits and seeds are attractive to wildlife; Larval food plant of butterflies

### Fruiting, Flowering and Tree Characteristics

- **Life-cycle Pattern:** 1-3yrs  
  4-8yrs  
  9-40yrs  
  41+ yrs

- **Shade Cast:** 7-12m
- **Height:** 10-20m

- **Tree crown may require annual maintenance**  
  - Moderate maintenance manageability

### Special Maintenance Requirements

- Propagation to Seedling
- Sapling to Semi-mature
- Mature
- Senescence

### Tolerance

#### Drought
- **Low**
- **Moderate**
- **High**

#### Roadside Pollution
- **Low**
- **Moderate**
- **High**

#### Pest & Disease Resistance
- **Low**
- **Moderate**
- **High**

#### Pruning
- **Low**
- **Moderate**
- **High**

#### Soil Compaction
- **Aggressive**
- **Moderate**
- **Manageable**

#### Root System
- **Soil Volume**
  - **Large**
  - **Medium**
  - **Small**

#### pH of Soil
- **Adaptability**
  - **H**
  - **M**
  - **L**
**Dracontomelon duperreanum**

### General Information
- **Family:** ANACARDIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife

### Fruiting, Flowering and Tree Characteristics
- **Fruits:**
- **Flowers:**

### Feature
- **Ecological Value:** 
- **Ornamental:** 
- **Shade Cast:**

### Special Maintenance Requirements
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

### Tolerance
- **Drought:**
  - Low
  - Moderate
  - High
- **Waterlogging:**
  - Low
  - Moderate
  - High
- **Roadside Pollution:**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High
- **Pruning:**
  - Low
  - Moderate
  - High
- **Soil Compaction:**
  - Low
  - Moderate
  - High
- **Root System:**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume:**
  - Large
  - Medium
  - Small
- **pH of Soil:**
  - Acid
  - Neutral
  - Alkaline

### Life-cycle Pattern (Years)
- 1-4 yrs
- 5-8 yrs
- 9-15 yrs
- 20-25 yrs

### Propagation to Seedling
- Sapling to Semi-mature
- Mature
- Senescence
**Ehretia longiflora**

**General Information**
- **Family:** BORAGINACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife

**Life-cycle Pattern (Years)**
- 6-10yrs
- 11-30yrs
- 5-8m
- 10-15m

**Feature**
- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**
- No Special Maintenance Requirements

**Tolerance**
- **Drought**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - L
  - M
  - S
  - Adaptability
**Elaeocarpus apiculatus**

**General Information**

- **Family:** ELAECARPACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Crown naturally layered in symmetrical tiers; Fruits attractive to wildlife

**Fruiting, Flowering and Tree Characteristics**

- **Fruits:**
- **Flowers:**

**Feature**

- **Ecological Value:**
- **Ornamental:**
- **Shade Cast:**

**Special Maintenance Requirements**

- Crown lifting may be required in sapling to semi-mature phase

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - High

- **Adaptability**

**Recommended Street Types**

- **A**
- **B**
- **C**
- **D**
- **E**
- **F**
- **G**
**Elaeocarpus chinensis**

**General Information**
- **Family:** ELAEOCARPACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife; often misidentified as other *Elaeocarpus* spp. eg. *Edubius*

**Feature**
- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**
- Crown lifting may be required in sapling to semi-mature phase

**Tolerance**
- **Drought**
  - Low
  - Moderate
  - High
- **Waterlogging**
  - Low
  - Moderate
  - High
- **Wind**
  - Low
  - Moderate
  - High
- **Roadside Pollution**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High
- **Pruning**
  - Low
  - Moderate
  - High
- **Soil Compaction**
  - Low
  - Moderate
  - High
- **Root System**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume**
  - Large
  - Medium
  - Small
- **pH of Soil**
  - Adaptable
**Elaeocarpus hainanensis** 水石榕

### General Information

- **Family:** ELAOCARPACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Crown naturally layered in symmetrical tiers; Fruits attractive to wildlife

### Special Maintenance Requirements

- Shrubby form may require formative pruning
- Tree crown may require annual maintenance

### Tolerance

#### Drought
- Low
- Moderate
- High

#### Roadside Pollution
- Low
- Moderate
- High

#### Pest & Disease Resistance
- Low
- Moderate
- High

#### Pruning
- Low
- Moderate
- High

#### Soil Compaction
- Low
- Moderate
- High

#### Root System
- Aggressive
- Moderate
- Manageable

#### Soil Volume
- Large
- Medium
- Small

#### pH of Soil
- L
- M
- S
- Adaptability

---

**Feature**

- Ecological Value: L
- Ornamental: M
- Shade Cast: L

---

**Recommended Street Types**

- A
- B
- C
- D
- E
- F
- G

---

**Fruiting, Flowering and Tree Characteristics**

- **Flowers**
- **Fruit**
- **Foliage Change**
**Elaeocarpus japonicus**

**General Information**
- **Family:** ELAECARPACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Crown naturally layered in symmetrical tiers; Fruits and flower nectar are attractive to wildlife

**Feature**
- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**
- Crown lifting may be required in sapling to semi-mature phase

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - Large
  - Medium
  - Small
  - Adaptability

**Fruiting, Flowering and Tree Characteristics**

**Recommended Street Types**

**Fruit**
- High
- High
- High

**Flower**
- Moderate
- Moderate
- Moderate

**Foliage Change**
- Moderate
- Moderate
- Moderate

**Heat Tolerance:**
- Moderate

**Adaptability:**
- Large
- Medium
- Small
**Ficus altissima**
高山榕, 雞榕

**General Information**

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
</table>

Family: MORACEAE  
Heat Tolerance: Moderate  
Special Properties: Fruits attractive to wildlife, Dense foliage, Roosting site; Aerial roots

---

**Feature**

- Ecological Value: M  
- Ornamental: M  
- Shade Cast: L

**Special Maintenance Requirements**

- Tree sap may cause skin irritation  
- Crown thinning may be needed to reduce wind resistance  
- Moderate maintenance manageability  
- Installation of root barriers or guides is recommended

---

**Tolerance**

<table>
<thead>
<tr>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Pest &amp; Disease Resistance</th>
<th>Soil Compaction</th>
<th>Root System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Aggressive</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Manageable</td>
</tr>
</tbody>
</table>

---

**Fruiting, Flowering and Tree Characteristics**

- Fruits: Attractive to wildlife, Dense foliage, Roosting site; Aerial roots

---

**Life-cycle Pattern (Years)**

- 1-3yrs  
- 4-10yrs  
- 11-70yrs  
- 71-80yrs

- 15-25m  
- 25-30m

---

**Ecological Value**

- Ornamental

---

**Soil Volume pH of Soil**

- Large  
- Medium  
- Small  
- Adaptability

---

**Adaptability**

- Large  
- Medium  
- Small
**Ficus binnendijkii**

**阿里垂榕**

### General Information

- **Family:** MORACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife; Dense foliage

### Life-cycle Pattern (Years)
- 1-3yrs: Sapling to Semi-mature
- 4-10yrs: Maturation
- 11-70yrs: Mature
- 71-80yrs: Senescence

### Special Maintenance Requirements

- Ecological Value: High
- Ornamental: High
- Shade Cast: Moderate

### Fruiting, Flowering and Tree Characteristics

- **Fruit:** Nov, Dec
- **Flower:** Jan, Feb
- **Foliage Change:** March, April

### Tolerance

- **Drought:**
  - Low
  - Moderate
  - High
- **Waterlogging:**
  - Low
  - Moderate
  - High
- **Wind:**
  - Low
  - Moderate
  - High
- **Roadside Pollution:**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High
- **Pruning:**
  - Low
  - Moderate
  - High
- **Root System:**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume:**
  - Large
  - Medium
  - Small
- **pH of Soil:**
  - High
  - Medium
  - Low

### Adaptable Characteristics

- Adaptability: Large, Medium, Small
**Ficus fistulosa**

- **Family:** MORACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits and seeds are attractive to wildlife

**Ecological Value:** Ornamental

**Feature Special Maintenance Requirements**
- Tree sap may cause skin irritation

---

### General Information

<table>
<thead>
<tr>
<th>Family: MORACEAE</th>
<th>Heat Tolerance: Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Properties: Fruits and seeds are attractive to wildlife</td>
<td></td>
</tr>
</tbody>
</table>

**Soil Volume**
- **Adaptability:** Large, Medium, Small

**pH of Soil**
- **Adaptability:** High, Moderate, Low

**Waterlogging**
- **Tolerance:** Low, Moderate, High

**Drought**
- **Tolerance:** Low, Moderate, High

**Roadside Pollution**
- **Tolerance:** Low, Moderate, High

**Pest & Disease Resistance**
- **Tolerance:** Low, Moderate, High

**Root System**
- **Adaptability:** Aggressive, Moderate, Manageable

**Soil Compaction**
- **Adaptability:** Low, Moderate, High

**Wind**
- **Tolerance:** Low, Moderate, High
**Ficus lyrata**

### General Information

- **Family:** MORACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Larval food plant of butterflies; Fruit attractive to wildlife

### Fruiting, Flowering and Tree Characteristics

<table>
<thead>
<tr>
<th>Season</th>
<th>Fruit</th>
<th>Flower</th>
<th>Foliage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Dec</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Jan</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Feb</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Mar</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Apr</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>May</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Jun</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Jul</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Aug</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Sep</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Oct</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Nov</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Dec</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

### Tolerance

- **Drought:** Low
- **Roadside Pollution:** Low
- **Pest & Disease Resistance:** Low
- **Waterlogging:** Low
- **Pruning:** Low
- **Wind:** Low
- **Pest & Disease Resistance:** Low
- **Waterlogging:** Low
- **Pruning:** Low

### Life-cycle Pattern (Years)

- 1-3yrs
- 4-10yrs
- 11-70yrs

### Special Maintenance Requirements

- Tree sap may cause skin irritation.
- Tree crown may require annual maintenance management.

### Feature Special Maintenance Requirements

<table>
<thead>
<tr>
<th>Feature</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td>M</td>
</tr>
<tr>
<td>Ornamental</td>
<td>M</td>
</tr>
<tr>
<td>Shade Cast</td>
<td>M</td>
</tr>
</tbody>
</table>

### Tolerance

- **Soil Volume:** 13yr - 80yr
- **pH of Soil:** 7-12m
- **Adaptability:** Large
- **Sapling to Semi-mature:** Moderate
- **Senescence:** Moderate
- **Propagation to Seedling:** Moderate
- **Mature:** Moderate
- **Ornamental:** Moderate

### Special Properties:
- Larval food plant of butterflies
- Fruit attractive to wildlife
**Ficus religiosa**

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - H
  - M
  - L

**Feature**

- **Ecological Value**
- **Ornamental**
- **Shade Cast**

**Special Maintenance Requirements**

- Tree sap may cause skin irritation
- Buttress root requires a large planting space
- Tree crown may require annual maintenance
- Installation of root barriers or guides is recommended

**Special Properties**

- Fruits and seeds attractive to wildlife
- Aerial roots
- Roosting site

**Family:** MORACEAE

**Heat Tolerance:** Moderate

**Fruiting, Flowering and Tree Characteristics**

- **Fruit:**
  - Nov
  - Dec
  - Jan
  - Feb
  - Mar
  - Apr
  - May
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct

- **Flower:**
  - Nov
  - Dec
  - Jan
  - Feb
  - Mar
  - Apr
  - May
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct

- **Foliage Change:**
  - Nov
  - Dec
  - Jan
  - Feb
  - Mar
  - Apr
  - May
  - Jun
  - Jul
  - Aug
  - Sep
  - Oct

- **Life-cycle Pattern (Years):**
  - 1-3yrs
  - 4-10yrs
  - 11-70yrs
  - 71-80yrs

**Notes:**

- Installation of root barriers or guides is recommended.

**Recommended Street Types**

- A
- B
- C
- D
- E
- F
- G

**Soil Volume pH of Soil Adaptability**

- Large
- Medium
- Small
- Adaptability
**Ficus subpisocarpa**

**Feature**
- Ecological Value: High
- Ornamental: Moderate
- Shade Cast: High

**Special Maintenance Requirements**
- Tree sap may cause skin irritation
- Installation of root barriers or guides is recommended

**Tolerance**
- **Drought**
  - Low: High
  - Moderate: Moderate
  - High: High
- **Waterlogging**
  - Low: Low
  - Moderate: Moderate
  - High: High
- **Wind**
  - Low: Low
  - Moderate: Moderate
  - High: High
- **Roadside Pollution**
  - Low: Low
  - Moderate: Moderate
  - High: High
- **Pest & Disease Resistance**
  - Low: Low
  - Moderate: Moderate
  - High: High
- **Pruning**
  - Low: Low
  - Moderate: Moderate
  - High: High
- **Soil Compaction**
  - Low: Low
  - Moderate: Moderate
  - High: High
- **Root System**
  - Aggressive: Low
  - Moderate: Medium
  - Manageable: Large
- **Soil Volume**
  - Large: Low
  - Medium: Medium
  - Small: High
- **pH of Soil**
  - Low: High
  - Medium: Moderate
  - High: Adaptability

**General Information**
- **Family**: MORACEAE
- **Heat Tolerance**: Moderate
- **Special Properties**: Fruits attractive to wildlife; Aerial roots

**Fruiting, Flowering and Tree Characteristics**

**Recommended Street Types**

**Economic Value**: Ornamental
**Ficus variegata**

**Tolerance**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Special Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td></td>
</tr>
<tr>
<td>Ornamental</td>
<td></td>
</tr>
<tr>
<td>Shade Cast</td>
<td></td>
</tr>
</tbody>
</table>

**Life-cycle Pattern (Years)**

- 1-3 yrs
- 4-10 yrs
- 11-70 yrs
- 71-80 yrs

**Characteristics**

- Tree sap may cause skin irritation
- Buttress root requires a large planting space
- Installation of root barriers or guides is recommended

**Adaptability**

- Large
- Medium
- Small

**Soil Volume**

- Low
- Moderate
- High

**pH of Soil**

- Low
- Moderate
- High

**Family:** MORACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Fruits attractive to wildlife; Larval food plant of butterflies; Roosting site

**Fruiting, Flowering and Tree Characteristics**

- General Information
- Tolerance
- Recommended Street Types
- Drought
- Roadside Pollution
- Soil Compaction
- Root System
- Pest & Disease Resistance
- Waterlogging
- Wind
- Fruits
- Pruning
- Root System

**Buttress Roots**

**Fruits**

- Fruits
- Flower
- Foliage Change

**Life-cycle Pattern (Years)**

- 1-3 yrs
- 4-10 yrs
- 11-70 yrs
- 71-80 yrs
**Ficus virens**
大葉榕, 黃葛樹

### General Information

<table>
<thead>
<tr>
<th>Feature</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td>Moderate</td>
</tr>
<tr>
<td>Ornamental</td>
<td>Moderate</td>
</tr>
<tr>
<td>Shade Cast</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Family:** MORACEAE

**Heat Tolerance:** Moderate

**Special Properties:** Fruits attractive to wildlife; Aerial roots; Roosting site

**Life-cycle Pattern (Years):**
- Sapling to Semi-mature: 1-3 yrs
- Senescence: 4-10 yrs
- Mature: 11-80 yrs
- 81-100 yrs

**17-22m**

**15-20m**

**Heat Tolerance:** Moderate

**Buttress Roots**

- Tree sap may cause skin irritation
- Buttress root requires a large planting space
- Tree crown may require annual maintenance
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

### Tolerance

<table>
<thead>
<tr>
<th>Condition</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drought</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Waterlogging</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Roadside Pollution</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Pest &amp; Disease Resistance</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Pruning</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Soil Compaction</strong></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Root System</strong></td>
<td>Aggressive</td>
<td>Moderate</td>
<td>Manageable</td>
<td>Aggressive</td>
<td>Moderate</td>
<td>Manageable</td>
<td>Aggressive</td>
</tr>
<tr>
<td><strong>Soil Volume</strong></td>
<td>Large</td>
<td>Medium</td>
<td>Small</td>
<td>Large</td>
<td>Medium</td>
<td>Small</td>
<td>Large</td>
</tr>
<tr>
<td><strong>pH of Soil</strong></td>
<td>H</td>
<td>M</td>
<td>L</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td>H</td>
</tr>
</tbody>
</table>
**Garcinia subelliptica**

**General Information**

- **Family:** CLUSIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Dense tree with beautiful glossy foliage; Bright orange fruits are attractive to wildlife. Doubling fruit may occur. It tolerates salty coastal winds.

**Feature**

- **Ecological Value**
- **Ornamental**
- **Shade Cast**

**Special Maintenance Requirements**

- No Special Maintenance Requirements

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - Adaptability
Hyophorbe lagenicaulis
酒瓶椰子

**General Information**

- **Family:** ARECACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Distinctive swollen bottle-like trunk; Fruits attractive to wildlife

**Tolerance**

- **Drought:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** N/A
- **Fruit Volume:** Large, Medium, Small
- **pH of Soil:** H, M, L
- **Adaptability:** Large, Medium, Small

**Recommended Street Types**

- A1, B2, C1, D2, E1, F1, G2

**Life-cycle Pattern (Years)**

- 1-3 yrs
- 4-10 yrs
- 11-50 yrs
- 51-60 yrs

**Feature**

- Ecological Value: High, Moderate, Low
- Ornamental: High, Moderate, Low
- Shade Cast: High, Moderate, Low

**Special Maintenance Requirements**

- No Special Maintenance Requirements

**Fruiting, Flowering and Tree Characteristics**

- **Flowers**
- **Fruits**
- **Foliage Change**
Ilex rotunda var. microcarpa
小果鐵冬青

**General Information**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Special Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td>No Special Maintenance Requirements</td>
</tr>
<tr>
<td>Ornamental</td>
<td></td>
</tr>
<tr>
<td>Shade Cast</td>
<td></td>
</tr>
</tbody>
</table>

**Family:** AQUIFOLIACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Fruits attractive to wildlife

**Tolerance**

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** High, Medium, Low
Juniperus chinensis ‘Kaizuka’

**General Information**

- **Family:** CUPRESSACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Dense foliage can be sculpted into topiaries; Attracts birds

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Foliage may cause skin irritation

**Tolerance**

- **Drought:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Low, Moderate, High

**Life-cycle Pattern (Years)**

- 1-3yrs
- 4-10yrs
- 11-40yrs
- 41-50yrs
- 1-2m
- 5-7m

**Fruiting, Flowering and Tree Characteristics**

- Flowers
- Fruits

**Adaptability**

- Large
- Medium
- Small

**Soil Volume pH of Soil**

- Low
- Moderate
- High

---

*Note: The images and diagrams provide visual representations of the tree’s characteristics and maintenance requirements.*
Koelreuteria elegans subsp. formosana

General Information

- **Family:** SAPINDACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Orange-red three-lobed capsule fruit, fragrant flowers

**Fruiting, Flowering and Tree Characteristics**

- **Fruits:**
- **Tree Bark:**

**Feature**

- **Ecological Value**
- **Ornamental**
- **Shade Cast**

**Special Maintenance Requirements**
- **No Special Maintenance Requirements**

**Tolerance**

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Highly Acidic, Acidic, Neutral, Basic, Highly Basic

**Tree Growth**
- **Life-Cycle Pattern (Years):** 5-60 yrs
- **Height:** 15-20 m
- **Growth Rate:** 1-3 yrs, 4-10 yrs, 11-30 yrs
**Liquidambar formosana**

**General Information**
- Family: HAMAMELIDACEAE
- Heat Tolerance: Moderate
- Special Properties: Fruits, seeds and flower nectar attractive to wildlife; Red and gold colored fall foliage

**Fruiting, Flowering and Tree Characteristics**
- Fruits
- Flower
- Foliage Change

**Feature**
- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

**Tolerance**
- **Drought**
  - Low
  - Moderate
  - High
- **Waterlogging**
  - Low
  - Moderate
  - High
- **Wind**
  - Low
  - Moderate
  - High
- **Roadside Pollution**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High
- **Pruning**
  - Low
  - Moderate
  - High
- **Soil Compaction**
  - Low
  - Moderate
  - High
- **Root System**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume**
  - Large
  - Medium
  - Small
- **pH of Soil**
  - Adaptability
**Litsea glutinosa**

**General Information**
- **Family:** LAURACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Flower nectar and fruits attractive to wildlife

**Feature**
- Ecological Value:
- Ornamental
- Shade Cast

**Special Maintenance Requirements**
- No Special Maintenance Requirements

**Tolerance**
- **Drought**: Low, Moderate, High
- **Waterlogging**: Low, Moderate, High
- **Wind**: Low, Moderate, High
- **Roadside Pollution**: Low, Moderate, High
- **Pest & Disease Resistance**: Low, Moderate, High
- **Pruning**: Low, Moderate, High
- **Soil Compaction**: Low, Moderate, High
- **Root System**: Aggressive, Moderate, Manageable
- **Soil Volume**: Large, Medium, Small
- **pH of Soil**: Large, Medium, Small

**Recommended Street Types**
- **A**
- **B**
- **C**
- **D**
- **E**
- **F**
- **G**
**Litsea monopetala**  
假柿木薑子, 假柿樹

**General Information**

- **Family:** LAURACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife

**Feature**

- Ecological Value: *H*  
- Ornamental: *H*  
- Shade Cast: *M*

**Special Maintenance Requirements**

- No Special Maintenance Requirements

**Tolerance**

- **Drought**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Waterlogging**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Wind**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Roadside Pollution**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Pest & Disease Resistance**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Pruning**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Soil Compaction**
  - Low: *Low*
  - Moderate: *Moderate*
  - High: *High*

- **Root System**
  - Aggressive: *Aggressive*
  - Moderate: *Moderate*
  - Manageable: *Manageable*

- **Soil Volume**
  - Large: *Large*
  - Medium: *Medium*
  - Small: *Small*

- **pH of Soil**
  - Adaptable: *Adaptable*
**Machilus breviflora**

短序潤楠, 短花楠

---

**General Information**

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Family:** LAURACEAE  
**Heat Tolerance:** High

**Special Properties:** Flower nectar and fruits attractive to wildlife

---

**Fruiting, Flowering and Tree Characteristics**

- **Life-cycle Pattern (Years):** 1-5yrs, 6-10yrs, 11-60yrs, 61-70yrs
- **Shade Cast:** Sapling to Semi-mature, Senescence, Mature
- **Ecological Value:** Ornamental

---

**Tolerance**

- **Drought:** Low, Moderate, High
- **Roadside Pollution:** Lo, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Low, Moderate, High

---

**Feature Special Maintenance Requirements**

- No Special Maintenance Requirements
**Machilus chekiangensis**

**General Information**

- **Family:** LAURACEAE
- **Heat Tolerance:** High
- **Special Properties:** Fruits attractive to wildlife

**Tolerance**

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** High, Medium, Low

**Feature**

- Ecological Value: Low, Moderate, High
- Ornamental: Low, Moderate, High
- Shade Cast: Low, Moderate, High

**Special Maintenance Requirements**

- No Special Maintenance Requirements

**Fruiting, Flowering and Tree Characteristics**

- **Flowers:**
  - Nov
  - Dec
  - Jan
  - Feb
  - Mar
  - Apr
  - May
  - Jun
  - Jul
  - Aug
  - Sep

- **Fruits:**
  - Sep
  - Oct
  - Nov

**Life-cycle Pattern (Years)**

- 1-5yrs
- 6-10yrs
- 11-60yrs
- 61-70yrs

**Propagation to Seedling**: 8-12m

**Sapling to Semi-mature**: 7-15m

**Senescence**: 6-15yrs

**Mature**: 15-20yrs

**Ecological Value**: Ornamental

**Adaptability**: Large, Medium, Small

**Soil Volume pH of Soil**: High, Medium, Low

**Special Properties**: Fruits attractive to wildlife

**Family**: LAURACEAE

**Native** | **Exotic** | **Evergreen** | **Deciduous** | **Partial Shade** | **Full Sun**
---|---|---|---|---|---

**Recommended Street Types**

- A
- B
- C
- D
- E
- F
- G
Machilus chinensis
華潤楠, 香港楠

General Information
Family: LAURACEAE  Heat Tolerance: Moderate
Special Properties: Fruits attractive to wildlife; Sourcing should be carefully examined as Machilus chinensis has been mis-used extensively in China for almost all Machilus spp.

Feature
Ecological Value  Ornamental  Shade Cast

Special Maintenance Requirements
- No Special Maintenance Requirements

Tolerance
Drought
Low  Moderate  High

Waterlogging
Low  Moderate  High

Wind
Low  Moderate  High

Roadside Pollution
Low  Moderate  High

Pest & Disease Resistance
Low  Moderate  High

Pruning
Low  Moderate  High

Soil Compaction
Low  Moderate  High

Root System
Aggressive  Moderate  Manageable

Soil Volume
Large  Medium  Small

pH of Soil
Adaptability
Machilus velutina
絨毛潤楠

**General Information**

- **Family**: LAURACEAE
- **Heat Tolerance**: Moderate
- **Special Properties**: Leaf blade leathery; fruits attractive to wildlife

**Tolerance**

- **Drought**: Low
- **Roadside Pollution**: Low
- **Waterlogging**: Low
- **Pest & Disease Resistance**: Low
- **Pruning**: Low
- **Soil Compaction**: Low
- **Root System**: Aggressive
- **Soil Volume**: Large
- **pH of Soil**: High

**Feature**

- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**

- No Special Maintenance Requirements

**Life-cycle Pattern (Years)**

- 1-5yrs: 15-18m
- 6-10yrs: 7-12m
- 11-60yrs: 7-12m

**Adaptability**

- Large
- Medium
- Small

**Adaptability**

- High
- Moderate
- Manageable
**Melia azedarach**

**General Information**

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
</table>

**Family:** MELIACEAE  
**Heat Tolerance:** High  
**Special Properties:** Fruits and flower nectar attractive to wildlife; tolerates salty coastal winds

**Fruiting, Flowering and Tree Characteristics**

- **Flowers**
- **Tree Bark**

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Timely removal of leaf litter is recommended to avoid altering soil pH
- Moderate maintenance manageability
- Entire plant is poisonous

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - Adaptable
**Michelia champaca**  
黃蘭

---

**General Information**

- **Family:** MAGNOLIACEAE  
- **Heat Tolerance:** Moderate
- **Special Properties:** Larval foodplants of butterflies; fragrant flowers, roosting site; dense foliage

---

**Feature**

- Ecological Value: H  
- Ornamental: H  
- Shade Cast: X

---

**Special Maintenance Requirements**

- Formative pruning is recommended
- Tree crown may require annual maintenance

---

**Tolerance**

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** H, M, L

---

**Life-cycle Pattern (Years)**

- 1-5 years
- 6-10 years
- 11-70 years
- 71-80 years

---

**Soil Volume**

- Large
- Medium
- Small

---

**pH of Soil**

- H
- M
- L
**Microcos nervosa**

**General Information**

- **Family:** TILIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits attractive to wildlife; Larval food plant of butterflies

**feature**

- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**

- Shrubby form may require formative pruning

**Tolerance**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Soil Compaction</th>
<th>Root System</th>
<th>Waterlogging</th>
<th>Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Aggressive</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Manageable</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

**Fruiting, Flowering and Tree Characteristics**

- **Fruit**
- **Flower**
- **Foliage Change**

**Life-cycle Pattern (Years)**

- Sapling to Seedling
- Propagation to Seedling
- Sapling to Semi-mature
- Mature
- Senescence

**Adaptability**

- Large
- Medium
- Small

**Soil Volume pH of Soil**

- Large
- Medium
- Small

**Ecological Value**

- Ornamental

**Heat Tolerance:** Moderate

**Shrubby form may require formative pruning**
**Nageia nagi**

**Family:** PODOCARPACEAE

**Heat Tolerance:** High

**Special Properties:** Dense foliage; relatively shade tolerant

---

**Tolerance**

- **Drought:**
  - Low
  - Moderate
  - High

- **Waterlogging:**
  - Low
  - Moderate
  - High

- **Wind:**
  - Low
  - Moderate
  - High

- **Roadside Pollution:**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High

- **Pruning:**
  - Low
  - Moderate
  - High

- **Soil Compaction:**
  - Low
  - Moderate
  - High

- **Root System:**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume:**
  - Large
  - Medium
  - Small

- **pH of Soil:**
  - Adaptability

---

**Recommended Street Types:**

- A
- B
- C
- D
- E
- F
- G

---

**General Information**

- **Adaptability:**
  - Large
  - Medium
  - Small

---

**Feature**

- **Ecological Value:**
  - Low
  - Moderate
  - High

- **Ornamental:**
  - Low
  - Moderate
  - High

- **Shade Cast:**
  - Low
  - Moderate
  - High

---

**Special Maintenance Requirements**

- No Special Maintenance Requirements

---

**Fruiting, Flowering and Tree Characteristics**

**Life-cycle Pattern (Years):**

- 1-5 yrs
- 6-10 yrs
- 11-50 yrs
- 51-60 yrs

---

**Fruits**

- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
- Aug
- Sep
- Oct

---

**Propagation to Seedling**

- No Special Maintenance Requirements
Palaquium formosanum
台灣膠木

**General Information**

<table>
<thead>
<tr>
<th>Tolerance</th>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadside Pollution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Compaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterlogging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest &amp; Disease Resistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pruning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recommended Street Types**

A D 1 B 2 C 1 D 1 E 2 F 2 G 2

**Special Properties:** Dense foliage

**Ecological Value:** Ornamental

**Special Maintenance Requirements:**
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

**Life-cycle Pattern (Yrs):**
- 1-3 yrs
- 4-10 yrs
- 11-40 yrs
- 41-50 yrs

**Heat Tolerance:** Moderate

**Soil Volume:**
- Large
- Medium
- Small

**pH of Soil:**
- L
- M
- S

**Adaptability:**
- Large
- Medium
- Small

**Fruiting, Flowering and Tree Characteristics:**

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Cellulose Pattern:**

- Fruit
- Flower
- Foliage Change

**Tree Bark**

**Flowers**

**Fruit**

**10-15m**

**12-20m**

**1-3yrs**

**4-10yrs**

**11-40yrs**

**41-50yrs**

**Propagation to Seedling**

**Sapling to Semi-mature**

**Mature**

**Senescence**

**Special Properties:** Dense foliage

**Family:** SAPOTACEAE

**Palaquium formosanum**

**台湾膠木**

**Heat Tolerance:**

**Drought:**
- Low
- Moderate
- High

**Roadside Pollution:**
- Low
- Moderate
- High

**Soil Compaction:**
- Low
- Moderate
- High

**Waterlogging:**
- Low
- Moderate
- High

**Wind:**
- Low
- Moderate
- High

**Pest & Disease Resistance:**
- Low
- Moderate
- High

**Pruning:**
- Low
- Moderate
- High

**Root System:**
- Aggressive
- Moderate
- Manageable

**Soil Volume:**
- Large
- Medium
- Small

**Adaptability:**
- L
- M
- S

**pH of Soil:**
- H
- M
- L
### General Information

<table>
<thead>
<tr>
<th>Adaptability</th>
<th>Large</th>
<th>Medium</th>
<th>Small</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Volume</td>
<td>L</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>pH of Soil</td>
<td>H</td>
<td>M</td>
<td>L</td>
</tr>
</tbody>
</table>

#### Tolerance

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - Adaptability

---

**Peltophorum tonkinense**

Family: CAESALPINIACEAE  
Heat Tolerance: Moderate

**Special Properties**: Glossy leaves; Yellow flowers  
Dense foliage

**Life-cycle Pattern (Years)**
- 1-5 yrs
- 6-10 yrs
- 11-70 yrs
- 71-80 yrs

**Sapling to Semi-mature**  
**Senescence**  
**Mature**  
**Propagation to Seedling**  
**Shade Cast**  
**Ecological Value**  
**Ornamental**  

**Feature**

- Moderate maintenance manageability

---

**Recommended Street Types**

<table>
<thead>
<tr>
<th>A1</th>
<th>B1</th>
<th>C1</th>
<th>D1</th>
<th>E1</th>
<th>F1</th>
<th>G1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Phoenix dactylifera

**General Information**

- **Family:** ARECACEAE
- **Heat Tolerance:** High
- **Special Properties:** Fruits attractive to wildlife, Larval food plant of butterflies

**Recommended Street Types**

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>B1</td>
<td>C1</td>
<td>D1</td>
<td>E1</td>
<td>F1</td>
</tr>
</tbody>
</table>

**Fruiting, Flowering and Tree Characteristics**

- ★ Propagation to Seedling
- ★ Sapling to Semi-mature
- ★ Mature
- ★ Senescence

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Sharp spines near leaf bases
- Leaflets also spiny

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - High
  - Moderate
  - Low
**Plumeria rubra** 雞蛋花, 紅雞蛋花

**Family:** APOCYNACEAE  
**Heat Tolerance:** High  
**Special Properties:** Pink or red fragrant flower; Tolerates salty coastal winds

### General Information

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
</table>

### Fruiting, Flowering and Tree Characteristics

- **Flowers**
- **Fruits**

### Life-cycle Pattern (Years)

- 61 yrs
- 1-2 yrs
- 6-10 yrs
- 11-30 yrs

### Feature

- **Ecological Value**
- **Ornamental**
- **Shade Cast**

### Special Maintenance Requirements

- Moderate maintenance manageability
- Crown thinning may be needed to reduce wind resistance
- Tree sap may cause skin irritation

### Tolerance

<table>
<thead>
<tr>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Soil Compaction</th>
<th>Root System</th>
<th>Soil Volume</th>
<th>pH of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Large</td>
<td>High</td>
</tr>
</tbody>
</table>
| Moderate| Moderate           | Moderate        | Moderate    | Medium      | Adaptability:
| High    | High               | High            | Manageable  | Small       |            |

| Waterlogging | Pest & Disease Resistance | Pruning | | | |
|--------------|----------------------------|---------| | | |
| Low          | Low                        | Low     | | | |
| Moderate     | Moderate                   | Moderate| | | |
| High         | High                       | High    | | | |

| Wind | | |
|------| | |
| Low  | | |
| Moderate | | |
| High | | |


Podocarpus macrophyllus
羅漢松

**General Information**

- **Family:** PODOCARPACEAE
- **Heat Tolerance:** High
- **Special Properties:** Regarded as a feng shui tree in Hong Kong; Dense foliage; Fruits attractive to wildlife

**Fruiting, Flowering and Tree Characteristics**

- **Life-cycle Pattern:**
  - 1-5 yrs
  - 6-10 yrs
  - 11-80 yrs
  - 81-100 yrs
- **Sapling to Semi-mature**
- **Senescence**
- **Mature**

**Feature**

- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**

- No Special Maintenance Requirements

**Tolerance**

- **Drought:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Adaptability

**Recommended Street Types**

- A1
- B2
- C1
- D2
- E1
- F2
- G1

**Soil Volume, pH of Soil, Adaptability**

**Adaptability:** Large, Medium, Small

**pH of Soil:** H, M, L

**Soil Volume:** L, M, S
**Polyalthia longifolia**

长葉暗羅

### General Information

- **Family:** ANNONACEAE
- **Heat Tolerance:** High
- **Special Properties:** Dense foliage; Fruits attractive to wildlife

### Tolerance

- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Adaptable, Medium, Low

### Life-cycle Pattern (Years)

- Sapling to Seedling
- Senescence
- Mature
- Propagation to Seedling

### Adaptability

- Native
- Exotic
- Evergreen
- Deciduous
- Partial Shade
- Full Sun

### Soil Volume

- pH of Soil

### Special Properties

- Dense foliage; Fruits attractive to wildlife
**Polyspora axillaris**

**General Information**

- **Family:** THEACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits, seeds and flowers attractive to wildlife; Larval food plant of butterflies

**Fruiting: Flowering and Tree Characteristics**

- **Flowers**
- **Fruits**

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Needs to be trained to have single trunk
- Shrubby form may require formative pruning

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High
- **Waterlogging**
  - Low
  - Moderate
  - High
- **Wind**
  - Low
  - Moderate
  - High
- **Roadside Pollution**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High
- **Pruning**
  - Low
  - Moderate
  - High
- **Soil Compaction**
  - Low
  - Moderate
  - High
- **Root System**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume**
  - Large
  - Medium
  - Small
- **pH of Soil**
  - High
  - Moderate
  - Low
  - Adaptability
**Pongamia pinnata**

**General Information**

- **Family:** Fabaceae
- **Heat Tolerance:** Moderate
- **Special Properties:** Pink or white fragrant flowers; Symbiotic relationship with nitrogen-fixing soil bacteria

**Fruiting, Flowering and Tree Characteristics**

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Tree crown may require annual maintenance
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended

**Tolerance**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drought</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Roadside Pollution</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waterlogging</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pest &amp; Disease Resistance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pruning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soil Compaction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Root System</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soil Volume</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>pH of Soil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Pterocarpus indicus**

*紫檀*

### General Information

**Family:** FABACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Larval food plant of butterflies; Symbiotic relationship with nitrogen-fixing soil bacteria; Dense foliage; Fruits attractive to wildlife; Fragrant flowers.

**Feature**
- Ecological Value: L  
- Ornamental: L  
- Shade Cast: L

**Special Maintenance Requirements**
- Fungi cause root and stem disease of young seedlings.
- Moderate maintenance manageability.
- Installation of root barriers or guides is recommended.

**Life-cycle Pattern (Years)**
- 1-5 yrs
- 6-15 yrs
- 16-75 yrs
- 76-100 yrs

**Fruiting, Flowering and Tree Characteristics**

- **Fruit:** Moderate  
- **Flower:** Moderate

**Soil Volume**
- Large: L  
- Medium: M  
- Small: S

**pH of Soil**
- Low: L  
- Moderate: M  
- High: H

### Tolerance

#### Drought
- Low: L  
- Moderate: M  
- High: H

#### Waterlogging
- Low: L  
- Moderate: M  
- High: H

#### Wind
- Low: L  
- Moderate: M  
- High: H

#### Pest & Disease Resistance
- Low: L  
- Moderate: M  
- High: H

#### Pruning
- Low: L  
- Moderate: M  
- High: H

#### Roadside Pollution
- Low: L  
- Moderate: M  
- High: H

#### Soil Compaction
- Low: L  
- Moderate: M  
- High: H

#### Root System
- Aggressive: A  
- Moderate: M  
- Manageable: G
**Pterospermum heterophyllum**  
翻白葉樹

### General Information

**Adaptability**
- Large
- Medium
- Small

**Heat Tolerance**
- Moderate

**Special Properties**
- Distinctive white colour on abaxial surface of leaf

**Family:** STERCULIACEAE

### Fruiting, Flowering and Tree Characteristics

- **Tolerance**
  - Drought: Low, Moderate, High
  - Roadside Pollution: Low, Moderate, High
  - Pest & Disease Resistance: Low, Moderate, High
  - Pruning: Low, Moderate, High
  - Soil Compaction: Low, Moderate, High
  - Root System: Aggressive, Moderate, Manageable
  - Soil Volume: Large, Medium, Small
  - pH of Soil: Low, Medium, High

### Life-cycle Pattern (Years)

- 1-3 yrs
- 4-15 yrs
- 16-60 yrs
- 61-70 yrs

- Shade Cast: Moderate maintenance manageability

### Special Requirements
- Ecological Value
- Ornamental
- Shade Cast
Radermachera hainanensis

General Information

Family: BIGNONIACEAE
Heat Tolerance: High
Special Properties: Glossy ornamental leaves and fragrant apricot coloured flowers; Flower nectar attractive to wildlife

Feature

Special Maintenance Requirements
- No Special Maintenance Requirements

Tolerance

Drought
- Low
- Moderate
- High

Roadside Pollution
- Low
- Moderate
- High

Soil Compaction
- Low
- Moderate
- High

Root System
- Aggressive
- Moderate
- Manageable

Waterlogging
- Low
- Moderate
- High

Wind
- Low
- Moderate
- High

Pruning
- Low
- Moderate
- High

Ecological Value: Ornamental
Shade Cast: Medium

Life-cycle Pattern (Years)
- 1-5 yrs
- 6-20 yrs
- 21-50 yrs
- 51-80 yrs
**Rhus hypoleuca**
白背鹽膚木

### General Information

- **Family:** ANACARDIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Larval food plant of butterflies

#### Life-cycle Pattern (Years)
- 1-3 yrs
- 4-15 yrs
- 16-60 yrs
- 61-70 yrs

#### Special Maintenance Requirements
- Tree sap may cause skin irritation

### Tolerance

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - High
  - Moderate
  - Small

### Special Properties
- Larval food plant of butterflies

### Adaptability

- Large
  - Low
  - Medium
  - High

### Ecological Value
- Ornamental

### Ecological Value

- Shade Cast

---

**Fruiting, Flowering and Tree Characteristics**

- **Fruit**
- **Flower**
- **Foliage Change**

---

**Recommended Street Types**

- **A**
- **B**
- **C**
- **D**
- **E**
- **F**
- **G**

---

**Heat Tolerance:** Moderate

**Recommended Street Types:**

- **A**
- **B**
- **C**
- **D**
- **E**
- **F**
- **G**

---

**Fruiting, Flowering and Tree Characteristics**

- **Fruit**
- **Flower**
- **Foliage Change**

---

**Recommended Street Types:**

- **A**
- **B**
- **C**
- **D**
- **E**
- **F**
- **G**

---

**General Information**

- **Native**
- **Exotic**
- **Evergreen**
- **Deciduous**
- **Partial Shade**
- **Full Sun**

---

**Waterlogging**

- Low
- Moderate
- High

---

**Pruning**

- Low
- Moderate
- High

---

**Root System**

- Aggressive
- Moderate
- Manageable

---

**Soil Volume**

- Large
- Medium
- Small

---

**pH of Soil**

- High
- Moderate
- Small
**Sapindus saponaria**

無患子, 木患子

### General Information

- **Family:** SAPINDACEAE
- **Heat Tolerance:** High
- **Special Properties:** Golden coloured fruits; Dense foliage; Tolerant of coastal salty wind

### Tolerance

- **Drought:**
  - Low
  - Moderate
  - High

- **Roadside Pollution:**
  - Low
  - Moderate
  - High

- **Waterlogging:**
  - Low
  - Moderate
  - High

- **Wind:**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High

- **Pruning:**
  - Low
  - Moderate
  - High

- **Soil Compaction:**
  - Low
  - Moderate
  - High

- **Root System:**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume:**
  - Large
  - Medium
  - Small

- **pH of Soil:**
  - High

### Feature

- **Ecological Value**
- **Ornamental**
- **Shade Cast**

### Special Maintenance Requirements

- Tree crown may require annual maintenance
- Moderate maintenance manageability
  - Installation of root barriers or guides is recommended
- Fruit and seeds are poisonous

---

**Fruiting, Flowering and Tree Characteristics**

<table>
<thead>
<tr>
<th>Life-cycle Pattern (Years)</th>
<th>Propagation to Seedling</th>
<th>Sapling to Semi-mature</th>
<th>Mature</th>
<th>Senescence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-20 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-60 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61-70 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fruit**
- 12-16m

**Flower**
- 10-20m
Sapium discolor

Family: EUPHORBIACEAE

Heat Tolerance: Moderate

Special Properties: Larval food plant of butterflies; fruits flower, nectar and seeds attractive to wildlife

Fruiting, Flowering and Tree Characteristics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Special Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td>Ornamental</td>
</tr>
<tr>
<td>Shade Cast</td>
<td></td>
</tr>
</tbody>
</table>

- No Special Maintenance Requirements

Tolerance

- Drought: Low, Moderate, High
- Roadside Pollution: Low, Moderate, High
- Pest & Disease Resistance: Low, Moderate, High
- Pruning: Low, Moderate, High
- Waterlogging: Low, Moderate, High
- Wind: Low, Moderate, High
- Soil Compaction: Low, Moderate, High
- Root System: Aggressive, Manageable
- Soil Volume: Large, Medium, Small
- pH of Soil: Low, Moderate, High

Recommended Street Types

<table>
<thead>
<tr>
<th>Native</th>
<th>Exotic</th>
<th>Evergreen</th>
<th>Deciduous</th>
<th>Partial Shade</th>
<th>Full Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Adaptability: Large, Medium, Small

- Life-cycle Pattern (Years):
  - Sapling to Semi-mature: 1-4yrs
  - Senescence: 11-40yrs
  - Mature: 41-50yrs
  - Propagation to Seedling: 6-10m
  - Shade Cast: 6-8m
  - Ecological Value: Ornamental
Sapium sebiferum

General Information

- **Family:** EUPHORBIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits, flower nectar and seeds attractive to wildlife; Colourful fall foliage

<table>
<thead>
<tr>
<th>Tolerance</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadside Pollution</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Compaction</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root System</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterlogging</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest &amp; Disease Resistance</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pruning</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td>Foliage Change</td>
<td>Flower</td>
<td>Foliage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruiting, Flowering and Tree Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Life-cycle Pattern (Years):** 1-3 yrs, 4-10 yrs, 11-40 yrs, 41-50 yrs
- **Height:** 8-10 m

**Ecological Value:** Ornamental

**Feature:**
- **Sapling to Semi-mature**
- **Senescence**
- **Mature**

**Special Maintenance Requirements:**
- Tree sap is poisonous
- Tree crown may require annual maintenance
- Installation of root barriers or guides is recommended
- Shrubby form may require formative pruning

**Special Properties:**
- Fruits, flower nectar and seeds attractive to wildlife; Colourful fall foliage

**Conclusions:**
- **Adaptability:** Large
- **Season:** Euphorbiaceae
- **Climate:** Semi-arid
- **Habitat:** Forest
- **Floral Period:** Autumn
- **Botanical:** Woody
- **Use:** Landscaping
- **Uses:** Ornamental

**Additional Notes:**
- **Thorns:** Present
- **Flowers:** Attractive
- **Fruits:** Attractive

**Technical Data:**
- **Soil Volume:** pH of Soil
- **Adaptability:** Large
- **Recommen Street Types:** A1 B1 C1 D1 E1 F1 G1

**Proposition:**
- **Installation:** Recommended
- **Pruning:** Manageable
- **Pollution:** Moderate
- **Compaction:** Manageable
- **Tree Characteristics:** Fruits, flowers, foliage

**Summary:**
Sapium sebiferum is a hardy and versatile plant suitable for various landscaping needs. Its attractive fruits and flowers, along with its hardiness, make it a popular choice for ornamental gardens.
Schima superba

**General Information**

- **Family**: THEACEAE
- **Heat Tolerance**: Moderate
- **Special Properties**: Flower nectar, fruits and seeds attractive to wildlife; Dense foliage; Showy cluster of white flowers

**Feature**

- **Ecological Value**: High
- **Ornamental**: High
- **Shade Cast**: Moderate

**Special Maintenance Requirements**

- Bark may cause skin irritation

**Tolerance**

- **Drought**: Low
- **Roadside Pollution**: Low
- **Pest & Disease Resistance**: Low
- **Pruning**: Low
- **Waterlogging**: Low
- **Wind**: Low
- **Soil Compaction**: High
- **Root System**: Manageable
- **Soil Volume**: Large
- **pH of Soil**: Low

**Recommended Street Types**

- **A**
- **B**
- **C**
- **D**
- **E**
- **F**
- **G**

**Schima superba**

木荷, 荷樹

**Fruiting, Flowering and Tree Characteristics**

- **Fruit**: Manageable
- **Flower**: Moderate
- **Foliage Change**: Moderate
- **Life-cycle Pattern (Years)**: 1-5 yrs, 6-10 yrs, 11-60 yrs, 61-80 yrs
- **Propagation to Seedling**: 8-10m
- **Sapling to Semi-mature**: 10-20m
- **Mature**: 20-50m
- **Senescence**: 50-100m

**Special Properties**

- Flower nectar, fruits and seeds attractive to wildlife; Dense foliage; Showy cluster of white flowers

**Soil Volume**

- **pH of Soil**: Low
- **Adaptability**: Large, Medium, Small
**Senna spectabilis**

**General Information**

- **Family:** CAESALPINIACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Bright yellow flowers; Dense foliage

**Feature**

- Ecological Value: M
- Ornamental: M
- Shade Cast: M

**Special Maintenance Requirements**

- Susceptible to fungal disease
- Tree crown may require annual maintenance
- Shrubby form may require formative pruning

**Fruiting, Flowering and Tree Characteristics**

**Tolerance**

- **Drought:** Low
- **Roadside Pollution:** Low
- **Waterlogging:** Low
- **Wind:** Low
- **Soil Compaction:** Low
- **Root System:** Manageable
- **Soil Volume:** Large
- **pH of Soil:** Medium

**Adaptability**

- Native: M
- Exotic: M
- Evergreen: M
- Deciduous: M
- Partial Shade: M
- Full Sun: M
**Swietenia mahagoni**  
桃花心木

### General Information

- **Family:** MELIACEAE  
- **Heat Tolerance:** Moderate  
- **Special Properties:** Tree bark has coarse fissured texture; distinctive buttress root; tolerates coastal salty winds

### Tolerance

- **Drought:** Low, Moderate, High
- **Roadside Pollution:** Low, Moderate, High
- **Soil Compaction:** Low, Moderate, High
- **Root System:** Aggressive, Moderate, Manageable
- **Waterlogging:** Low, Moderate, High
- **Pest & Disease Resistance:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Pruning:** Low, Moderate, High
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** Low, Moderate, High

### Feature

- Ecological Value: High, Moderate, Low  
- Ornamental: High, Moderate, Low
- Shade Cast: High, Moderate, Low

### Special Requirements

- Branches should not be allowed to grow larger than two-thirds the diameter of the trunk
- Formative pruning is recommended
**Syzygium cumini**
烏墨, 海南蒲桃

**General Information**

- **Family:** MYRTACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Fruits and flower nectar attractive to wildlife; Larval food plant of butterflies

**Feature**

- Ecological Value: **H M L**
- Ornamental: **H M L**
- Shade Cast: **H M L**

**Special Maintenance Requirements**

- Tree crown may require annual maintenance
- Moderate maintenance manageability

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - High
  - Moderate
  - Low
**Syzygium hancei**

**General Information**

- **Family:** MYRTACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Flower nectar and fruits attractive to wildlife

**Feature**

- Ecological Value: High
- Ornamental: High
- Shade Cast: High

**Special Maintenance Requirements**

- Moderate maintenance manageability

**Tolerance**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Soil Compaction</th>
<th>Root System</th>
<th>Waterlogging</th>
<th>Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Aggressive</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Manageable</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

**Fruiting, Flowering and Tree Characteristics**

- **Life-cycle Pattern (Years):**
  - 1-5yrs
  - 6-15yrs
  - 16-50yrs
  - 51-70yrs

- **Adaptability:**
  - Large
  - Medium
  - Small

- **Soil Volume:**
  - Large
  - Medium
  - Small

- **pH of Soil:**
  - High
  - Moderate
  - Low

**Tree Bark**

- Moderate maintenance manageability

**Flowers**

- Grow during the summer months.

**Fruit and Foliage Change**

- Moderate maintenance manageability
Syzygium jambos

**General Information**

Family: MYRTACEAE  
Heat Tolerance: Moderate  
Special Properties: Fruit and flower nectar attractive to wildlife; Large pom-pom shaped flowers

**Fruiting, Flowering and Tree Characteristics**

- Propagation to Seedling
- Sapling to Semi-mature
- Mature
- Senescence

**Life-cycle Pattern (Years)**

- 0-5 yrs
- 5-10 yrs
- 10-15 yrs
- 15-20 yrs

**Feature**

- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**

- Susceptible to fungal diseases such as root rot, leaf spot and anthracnose
- Tree crown may require annual maintenance
- Moderate maintenance manageability

**Tolerance**

- **Drought**
  - Low
  - Moderate
  - High

- **Waterlogging**
  - Low
  - Moderate
  - High

- **Wind**
  - Low
  - Moderate
  - High

- **Pest & Disease Resistance**
  - Low
  - Moderate
  - High

- **Roadside Pollution**
  - Low
  - Moderate
  - High

- **Pruning**
  - Low
  - Moderate
  - High

- **Soil Compaction**
  - Low
  - Moderate
  - High

- **Root System**
  - Aggressive
  - Moderate
  - Manageable

- **Soil Volume**
  - Large
  - Medium
  - Small

- **pH of Soil**
  - L
  - M
  - H
  - L

- **Adaptability**
**Syzygium levinei**

**Family:** MYRTACEAE  
**Heat Tolerance:** Moderate  
**Special Properties:** Larval food plant of butterflies; Fruit and flower nectar attractive to wildlife

---

### General Information

<table>
<thead>
<tr>
<th>Feature</th>
<th>Special Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Value</td>
<td>Moderate maintenance manageability</td>
</tr>
<tr>
<td>Ornamental</td>
<td></td>
</tr>
<tr>
<td>Shade Cast</td>
<td></td>
</tr>
</tbody>
</table>

### Special Properties

- Larval food plant of butterflies
- Fruit and flower nectar attractive to wildlife

### Fruiting, Flowering and Tree Characteristics

- **Fruit:**
  - Life-cycle Pattern: 1-5 yrs
  - Height: 8-12 m
- **Flower:**
  - Life-cycle Pattern: 6-15 yrs
  - Height: 10-15 m
- **Tree Bark:**
  - Life-cycle Pattern: 16-50 yrs
  - Height: 10-15 m

### Tolerance

- **Drought:**
  - Low
  - Moderate
  - High
- **Waterlogging:**
  - Low
  - Moderate
  - High
- **Wind:**
  - Low
  - Moderate
  - High
- **Roadside Pollution:**
  - Low
  - Moderate
  - High
- **Pest & Disease Resistance:**
  - Low
  - Moderate
  - High
- **Pruning:**
  - Low
  - Moderate
  - High
- **Soil Compaction:**
  - Low
  - Moderate
  - High
- **Root System:**
  - Aggressive
  - Moderate
  - Manageable
- **Soil Volume:**
  - Large
  - Medium
  - Small
- **pH of Soil:**
  - Adaptability

---

**Syzygium levinei**

山蒲桃

---

**Recommended Street Types**

- A
- B
- C
- D
- E
- F
- G

**Native Exotic Evergreen Deciduous Partial Shade Full Sun**
**Thespesia populnea**
恒春黃槿, 繖楊

**General Information**

- **Family:** MALVACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Mangroves tree; Dense foliage; Tolerates coastal salty winds, showy flowers

**Feature**

- **Ecological Value:** M-L
- **Ornamental:** M-L
- **Shade Cast:** M-L

**Special Maintenance Requirements**

- Prone to fungal root and butt rot caused by *Phellinus noxius*
- Moderate maintenance manageability
- Installation of root barriers or guides is recommended
- Tree crown may require annual maintenance

**Tolerance**

- **Drought:** Low-Moderate-High
- **Waterlogging:** Low-Moderate-High
- **Wind:** Low-Moderate-High
- **Pest & Disease Resistance:** Low-Moderate-High
- **Pruning:** Low-Moderate-High
- **Roadside Pollution:** Low-Moderate-High
- **Soil Compaction:** Aggressive-Moderate-Manageable
- **Soil Volume:** Large-Medium-Small
- **pH of Soil:** Low-Moderate-High
**Wodyetia bifurcata**

**General Information**

- **Family:** ARECACEAE
- **Heat Tolerance:** Moderate
- **Special Properties:** Foxtail-like fronds; Attractive red fruits

**Ecological Value**

- Ornamental
- Shade Cast

**Feature Special Maintenance Requirements**

- Monitoring of old leaves is needed to prevent injury from falling leaves
- Irrigation is recommended in extended dry periods

**Special Properties**

- Foxtail-like fronds
- Attractive red fruits

**Life-cycle Pattern (Years)**

- 1-5 yrs
- 6-15 yrs
- 16-50 yrs
- 51-60 yrs

**Tolerance**

**Drought**

- Low
- Moderate
- High

**Waterlogging**

- Low
- Moderate
- High

**Wind**

- Low
- Moderate
- High

**Roadside Pollution**

- Low
- Moderate
- High

**Pest & Disease Resistance**

- Low
- Moderate
- High

**Pruning**

- Low
- Moderate
- High

**Soil Compaction**

- Low
- Moderate
- High

**Root System**

- Aggressive
- Moderate
- Manageable

**Soil Volume**

- Large
- Medium
- Small

**pH of Soil**

- High

---

**Adaptability**

- Large
- Medium
- Small
**Xanthostemon chrysanthus**

**General Information**
- **Family**: MYRTACEAE
- **Heat Tolerance**: Moderate
- **Special Properties**: Larval food plant of butterflies; Flower nectar attractive to wildlife; Bright yellow flowers

**Fruiting, Flowering and Tree Characteristics**
- **Fruit**: Green
- **Flower**: Yellow
- **Foliage Change**: Green

**Feature**
- Ecological Value
- Ornamental
- Shade Cast

**Special Maintenance Requirements**
- No special maintenance requirement

**Tolerance**

<table>
<thead>
<tr>
<th>Drought</th>
<th>Roadside Pollution</th>
<th>Soil Compaction</th>
<th>Root System</th>
<th>Soil Volume</th>
<th>pH of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Aggressive</td>
<td>Large</td>
<td>High</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Manageable</td>
<td>Small</td>
<td>Low</td>
</tr>
</tbody>
</table>

| Waterlogging | Pest & Disease Resistance | Pruning | | |
|--------------|---------------------------|---------|| |
| Low          | Low                       | Low     | | |
| Moderate     | Moderate                  | Moderate| | |
| High         | High                      | High    | | |
**Zanthoxylum avicennae**

**Feature**
- Ecological Value: High
- Ornamental: Medium
- Shade Cast: Low

**Special Maintenance Requirements**
- Poisonous fruits

**Adaptability**
- Large

**Tolerance**
- **Drought:** Low, Moderate, High
- **Waterlogging:** Low, Moderate, High
- **Wind:** Low, Moderate, High
- **Soil Volume:** Large, Medium, Small
- **pH of Soil:** High
- **Propagation to Seedling:** Moderate
- **Sapling to Semi-mature:** Moderate
- **Mature:** Moderate
- **Senescence:** Moderate

**Family:** RUTACEAE
**Heat Tolerance:** Moderate
**Special Properties:** Fruits attractive to wildlife; Larval food of butterflies; Tree trunk and branches has thorns

**Life-cycle Pattern (Years):**
- 1-5 yrs
- 5-10 yrs
- 10-20 yrs
- 20-50 yrs
- 50 yrs +

**Fruiting, Flowering and Tree Characteristics**

**Recommended Street Types**
- A1
- B2
- C1
- D1
- E1
- F2
- G1

**General Information**

- Native: Exotic
- Evergreen: Deciduous
- Partial Shade: Full Sun

**Ecological Value:** Ornamental

**Tree Bark**

- Tree Bark: Picture

**Fruit Foliage Change**

- Flower: Picture

**Sapling to Semi-mature**

- Senescence: Picture

**Mature**

- Pruning: Picture

**61-70yrs**

- 1-3yrs
- 5-8m
- 8-15m

**80-100yrs**

- 6-10yrs
- 11-60yrs
- 61-70yrs

**10-20m**

- 15-20m

**Special Properties:**
- Fruits attractive to wildlife;
- Larval food of butterflies;
- Tree trunk and branches has thorns
Appendix B. Tree Selection Criteria Rating
## Explanation for Selection Criteria Ratings

<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate Resilience</strong></td>
<td>1. Ability to withstand transitory or constantly high temperature in summer at ≥ 35°C for 2 weeks time without leaf loss or leaf burn; abnormal health stresses</td>
<td>1. Ability to withstand summer mean temperature (29°C) for more than 2 weeks without leaf loss or leaf burn; abnormal health stresses</td>
<td>1. Ability to withstand summer mean temperature (29°C) with sign of leaf or leaf burn; abnormal health stresses</td>
<td>1. Species not known to have adapted to climatic conditions</td>
</tr>
<tr>
<td>Crown Management</td>
<td>Minimal crown management is required within a year for traffic headroom</td>
<td>Moderate crown management is required half-yearly or less for traffic headroom</td>
<td>Crown management is required within a year for traffic headroom</td>
<td>1. Species not known whether supporting measures are necessary throughout species’ life span, and/or 2. Species not known to have minimal crown structural strength</td>
</tr>
<tr>
<td><strong>Life-Cycle Planning</strong></td>
<td>Life-Cycle Planning</td>
<td>Life-Cycle Planning</td>
<td>Life-Cycle Planning</td>
<td>Life-Cycle Planning</td>
</tr>
<tr>
<td>Wind Tolerance</td>
<td>1. Can tolerate dry spell ≥ 2 months without supplementary irrigation, and</td>
<td>2. Can quickly recover from temporary wilting after any regime of irrigation, and/or</td>
<td>3. Can tolerate when consistently exposed to drought stress during growing season.</td>
<td>4. Species with botanical interest, or 2. Native species that provide less variety of habitat values</td>
</tr>
<tr>
<td>Waterlogging Tolerance</td>
<td>1. Adapted to waterlogged peat, and/or</td>
<td>2. Can recover within annual rainfall after flooding</td>
<td>3. Can survive temporarily. Amber rainfall or above signs and translocation events, and/or</td>
<td>2. Moderate amounts of plant litter, and/or 3. Moderate maintenance frequency in order for tree to survive.</td>
</tr>
<tr>
<td>Urban Useful Life Expectancy</td>
<td>1. Projected at least 40 year growth before senescence in location</td>
<td>1. Projected 20-40 year growth before senescence in location</td>
<td>1. Projected &lt;20 year growth before senescence in location</td>
<td>1. Unknown years of growth before over-maturity in location</td>
</tr>
<tr>
<td>Pest and Disease Resistance</td>
<td>1. Without known common pests and diseases in Hong Kong, and or</td>
<td>2. Species of scientific value to the location</td>
<td>3. High structural strength; low tree limb brittleness.</td>
<td>1. Fruit or seed drops are a safety hazard, or sticky, or not a safety hazard or no fruit or seed drops, and/or 2. Species not known to have fruit or seed drops</td>
</tr>
<tr>
<td><strong>Raided Pollution Tolerance</strong></td>
<td>1. High tolerance to pollution; does not wilt or die</td>
<td>2. Can maintain fair tree form during the following growing season after pruning, and/or</td>
<td>2. Can maintain fair tree form within the same growing season after pruning, and/or</td>
<td>1. High structural strength; low tree limb brittleness, and/or 2. High mechanical stress tolerance - strong and stiff or strong and moderately stiff, and/or 3. High maintenance frequency in order for tree to survive.</td>
</tr>
<tr>
<td><strong>Soil Compaction Tolerance</strong></td>
<td>1. Survive in soil with bulk density ≤ 1.92 Mg/cubic meter, and/or</td>
<td>2. Can maintain fair tree form during the following growing season after pruning, and/or</td>
<td>3. Can maintain fair tree form within the same growing season after pruning, and/or</td>
<td>1. High maintenance frequency in order for tree to survive.</td>
</tr>
<tr>
<td><strong>Soil Volume Tolerance</strong></td>
<td>1. (Small) Species can maintain fair tree health, condition and form in small planting sites (average soil surface area for each tree: 1.0m to 1.5m dia. X 1.2m depth)</td>
<td>2. (Medium) Species can maintain fair tree health, condition and form in medium-sized planting sites (average soil surface area for each tree: 1.6m to 2.0m dia. X 1.2m depth), and/or</td>
<td>3. (Large) Species can maintain fair tree health, condition and form in large-sized planting sites (average soil surface area for each tree: 4.0m dia. X 1.2m depth)</td>
<td>1. (Large) Species can maintain fair tree health, condition and form in large-sized planting sites (average soil surface area for each tree: 4.0m dia. X 1.2m depth)</td>
</tr>
<tr>
<td><strong>Soil pH</strong></td>
<td>1. (Small) Species that can grow properly / perform well only in very acid soils with pH ≤ 4.0 - 4.5, and/or 2. Moderate amounts of plant litter, and/or 3. Moderate maintenance frequency in order for tree to survive.</td>
<td>1. (Medium) Species with medium range pH tolerance (pH ≤ 5.5 - 7.0)</td>
<td>1. (Large) Species with medium to acid soils (pH ≤ 5.5 - 6.5) or slightly alkaline soil (pH 6.5 - 7.0)</td>
<td>1. (Small) Species with small range pH tolerance: (pH ≤ 5.5)</td>
</tr>
<tr>
<td><strong>Tree Size Dimension</strong></td>
<td>1. (Large) Species with large mature size: diameter of crown greater than 15m or height between 5-15m</td>
<td>1. (Medium) Species with medium size range: diameter of crown 5-15m or height between 5-15m</td>
<td>1. (Small) Species with small size range: diameter of crown less than 5m and height less than 5m</td>
<td>1. (Small) Species not known to have adapted to various soil pH conditions</td>
</tr>
<tr>
<td><strong>Ecological Value</strong></td>
<td>1. Native species that provide a variety of habitat values, or 2. Species of scientific value to the location</td>
<td>3. High maintenance frequency in order for tree to survive.</td>
<td>1. Species that can grow properly / perform well only in very acid soils with pH ≤ 4.0 - 4.5, and/or 2. Moderate amounts of plant litter, and/or 3. Moderate maintenance frequency in order for tree to survive.</td>
<td>1. Species not known to have adapted to various soil pH conditions</td>
</tr>
<tr>
<td><strong>Shade Cost</strong></td>
<td>1. Species with low shade cost by small tree species (diameter of crown less than 5m) and low foliage density at mature stage in summertime</td>
<td>1. Species with moderate shade cost by medium sized spreading crown (diameter of crown 5-15m) or moderate foliage density at mature stage in summertime</td>
<td>1. Species with low shade cost by small tree species (diameter of crown less than 5m) and low foliage density at mature stage in summertime</td>
<td>1. Species not known to have adapted to various shade cost sources.</td>
</tr>
</tbody>
</table>

**Note:** Tree species which do not fulfil minimum acceptance level are excluded from this rating process and are not considered. This includes species being inadaptable to Hong Kong climate, invasive to local ecosystems or with little intrinsic value.

1. **Medium** refers to a species that is moderately adaptable to Hong Kong climate and which is likely to perform reasonably well in Hong Kong conditions.
2. **High** refers to a species that is highly adaptable to Hong Kong climate and which is expected to perform well in Hong Kong conditions.
3. **Low** refers to a species that is less adaptable to Hong Kong climate and which is expected to perform poorly in Hong Kong conditions.

*Appendix B - Tree Selection Criteria Rating*

---

*Appendix B - Tree Selection Criteria Rating*

### Attributes

- **Essential Attributes**
  - **Climate Resilience**
  - **Life-Cycle Planning**
  - **Urban Useful Life Expectancy**
  - **Pest and Disease Resistance**
  - **Raided Pollution Tolerance**
  - **Soil Compaction Tolerance**
  - **Soil Volume Tolerance**
  - **Soil pH**
  - **Tree Size Dimension**
  - **Ecological Value**
  - **Shade Cost**

### Attributes

- **Valued Attributes**
  - **Climate Resilience**
  - **Life-Cycle Planning**
  - **Urban Useful Life Expectancy**
  - **Pest and Disease Resistance**
  - **Raided Pollution Tolerance**
  - **Soil Compaction Tolerance**
  - **Soil Volume Tolerance**
  - **Soil pH**
  - **Tree Size Dimension**
  - **Ecological Value**
  - **Shade Cost**

### Attributes

- **Note:** Tree species which do not fulfil minimum acceptance level are excluded from this rating process and are not considered. This includes species being inadaptable to Hong Kong climate, invasive to local ecosystems or with little intrinsic value.

1. **Medium** refers to a species that is moderately adaptable to Hong Kong climate and which is likely to perform reasonably well in Hong Kong conditions.
2. **High** refers to a species that is highly adaptable to Hong Kong climate and which is expected to perform well in Hong Kong conditions.
3. **Low** refers to a species that is less adaptable to Hong Kong climate and which is expected to perform poorly in Hong Kong conditions.
4. **Minimal** refers to a species that is minimally adaptable to Hong Kong climate and which is expected to perform poorly in Hong Kong conditions.

*Appendix B - Tree Selection Criteria Rating*
### Tree Information and Characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific name</th>
<th>Chinese description</th>
<th>Family name</th>
<th>Provenance</th>
<th>Deciduous / Evergreen</th>
<th>Flowering period</th>
<th>Fruiting period</th>
<th>Height</th>
<th>Canopy Spread</th>
<th>Sunlight preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adenanthera microsperma</td>
<td>海紅豆, 孔雀豆</td>
<td>MIMOSACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Apr-Jul</td>
<td>Jul-Oct</td>
<td>15-20m</td>
<td>12-15m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>2</td>
<td>Arenga pinnata</td>
<td>砂糖椰子, 拂榔</td>
<td>ARECACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Jun</td>
<td>Sept-Oct</td>
<td>15-20m</td>
<td>3-5m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>3</td>
<td>Albizia julibrissin</td>
<td>合歡</td>
<td>MIMOSACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>May-Jul</td>
<td>Aug-Oct</td>
<td>8-12m</td>
<td>8-15m</td>
<td>full sun</td>
</tr>
<tr>
<td>4</td>
<td>Aporosa dioica</td>
<td>銀柴, 大沙葉</td>
<td>EUPHORBIACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jan-Dec</td>
<td>Jan-Dec</td>
<td>7-10m</td>
<td>4-6m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>5</td>
<td>Bixa orellana</td>
<td>紅木</td>
<td>BIXACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>May-Aug</td>
<td>Sep-Feb</td>
<td>5-8m</td>
<td>4-8m</td>
<td>full sun</td>
</tr>
<tr>
<td>6</td>
<td>Brachychiton acerifolius</td>
<td>槭葉蘋婆</td>
<td>STERCULIACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>April</td>
<td>April-May</td>
<td>10-15m</td>
<td>8-8m</td>
<td>full sun</td>
</tr>
<tr>
<td>7</td>
<td>Bridelia tomentosa</td>
<td>土蜜樹, 逼迫仔</td>
<td>EUPHORBIACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jan-Dec</td>
<td>Jan-Dec</td>
<td>5-12m</td>
<td>2-7m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>8</td>
<td>Caesalpinia ferrea</td>
<td>巴西鐵木</td>
<td>CAESALPINIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Jun-Aug</td>
<td>Jun-Aug</td>
<td>6-12m</td>
<td>4-10m</td>
<td>full sun</td>
</tr>
<tr>
<td>9</td>
<td>Carallia brachiata</td>
<td>竹節樹</td>
<td>RHIZOPHORACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Nov-Apr</td>
<td>Feb-Jul</td>
<td>7-10m</td>
<td>6-8m</td>
<td>full sun</td>
</tr>
<tr>
<td>10</td>
<td>Cassia x nealiae</td>
<td>彩虹雨樹</td>
<td>CAESALPINIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>May</td>
<td>no fruit</td>
<td>10-15m</td>
<td>12-17m</td>
<td>full sun</td>
</tr>
<tr>
<td>11</td>
<td>Cassia javanica var. indochinensis</td>
<td>熱果 deciduous</td>
<td>CAESALPINIACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>May-Jun</td>
<td>July-Aug</td>
<td>10-15m</td>
<td>12-18m</td>
<td>full sun</td>
</tr>
<tr>
<td>12</td>
<td>Celtis timorensis</td>
<td>假玉桂</td>
<td>ULMACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>March-May</td>
<td>July-Nov</td>
<td>5-8m</td>
<td>4-6m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>13</td>
<td>Choerospondias axillaris</td>
<td>水翁</td>
<td>ANACARDIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Jun</td>
<td>Sep-Nov</td>
<td>8-20m</td>
<td>10-15m</td>
<td>full sun</td>
</tr>
<tr>
<td>14</td>
<td>Chukrasia tabularis</td>
<td>麻楝</td>
<td>MELIACEAE</td>
<td>Exotic</td>
<td>Semi-Deciduous</td>
<td>Apr-May</td>
<td>Apr-Oct</td>
<td>15-25m</td>
<td>12-18m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>15</td>
<td>Cinnamomum parthenoxylon</td>
<td>黃樟</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Mar-May</td>
<td>Apr-Oct</td>
<td>10-20m</td>
<td>6-12m</td>
<td>full sun</td>
</tr>
<tr>
<td>16</td>
<td>Cleistocalyx nervosum</td>
<td>水荷</td>
<td>MYRTACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>May-June</td>
<td>Aug-Sept</td>
<td>10-15m</td>
<td>12-17m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>17</td>
<td>Cordia dichotoma</td>
<td>卡氏木</td>
<td>BORAGINACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>April-Jun</td>
<td>June-Sept</td>
<td>5-8m</td>
<td>3-5m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>18</td>
<td>Crateva unilocularis</td>
<td>千葉栓木</td>
<td>FABACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>April-May</td>
<td>June-Nov</td>
<td>5-8m</td>
<td>5-10m</td>
<td>full sun</td>
</tr>
<tr>
<td>19</td>
<td>Cristaria chiricahua</td>
<td>黑牛木</td>
<td>CLUSIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Apr-May</td>
<td>June</td>
<td>8-10m</td>
<td>10-12m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>20</td>
<td>Dalbergia assamica</td>
<td>鋼纖黃檀</td>
<td>FABACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>May-Oct</td>
<td>Sept-Nov</td>
<td>10-15m</td>
<td>8-12m</td>
<td>full sun to partial shade</td>
</tr>
<tr>
<td>21</td>
<td>Diospyros morrisiana</td>
<td>罗浮柿</td>
<td>EBENACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>April-May</td>
<td>June-Nov</td>
<td>10-20m</td>
<td>7-12m</td>
<td>full sun to partial shade</td>
</tr>
</tbody>
</table>
## Appendix B - Tree Selection Criteria Rating

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific name</th>
<th>Botanical name</th>
<th>Family name</th>
<th>Provenance</th>
<th>Deciduous/ Evergreen</th>
<th>Flowering period</th>
<th>Fruiting period</th>
<th>Height</th>
<th>Canopy Spread</th>
<th>Sunlight preference</th>
<th>Tree contains poisonous parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Dracaentonetelon duperreanum</td>
<td>人面子</td>
<td>ANACARDIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Apr-May</td>
<td>Jun-Nov</td>
<td>20-25m</td>
<td>10-15m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>Ehretia longiflora</td>
<td>長花厚殼樹</td>
<td>BORAGINACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Jan-Sep</td>
<td>Jan-Sep</td>
<td>10-15m</td>
<td>5-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>Elaeocarpus apiculatus</td>
<td>高芒杜英</td>
<td>ELAEOCARPACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Aug-Sept</td>
<td>Oct-Jan</td>
<td>20-30m</td>
<td>12-15m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>26</td>
<td>Elaeocarpus chinensis</td>
<td>中華杜英</td>
<td>ELAEOCARPACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>May-Jun</td>
<td>Oct-Nov</td>
<td>5-8m</td>
<td>3-5m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>27</td>
<td>Elaeocarpus hainanensis</td>
<td>水石榴</td>
<td>ELAEOCARPACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Jun-Jul</td>
<td>Jul-Sept</td>
<td>3-5m</td>
<td>3-6m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>28</td>
<td>Elaeocarpus japonicus</td>
<td>日本杜英</td>
<td>ELAEOCARPACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Apr-May</td>
<td>May-Jul</td>
<td>15-25m</td>
<td>10-15m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>29</td>
<td>Ficus altissima</td>
<td>高山榕</td>
<td>MORACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Oct</td>
<td>Mar-Oct</td>
<td>25-30m</td>
<td>15-25m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>30</td>
<td>Ficus binnendijkii</td>
<td>阿里垂榕</td>
<td>MORACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Apr-May</td>
<td>May-Jul</td>
<td>15-25m</td>
<td>15-30m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>31</td>
<td>Ficus fistulosa</td>
<td>水石榴</td>
<td>MORACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Mar-Dec</td>
<td>Mar-Dec</td>
<td>4-8m</td>
<td>3-6m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>32</td>
<td>Ficus lyrata</td>
<td>大琴葉榕</td>
<td>MORACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Nov</td>
<td>Nov-Dec</td>
<td>7-12m</td>
<td>7-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>33</td>
<td>Ficus religiosa</td>
<td>神代樹</td>
<td>MORACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Dec</td>
<td>Nov-Dec</td>
<td>15-20m</td>
<td>15-30m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>34</td>
<td>Ficus subpisocarpa</td>
<td>鐵筆榕</td>
<td>MORACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Feb-Sep</td>
<td>Feb-Sep</td>
<td>5-10m</td>
<td>5-12m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>35</td>
<td>Ficus variegata</td>
<td>青果榕</td>
<td>MORACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Mar-Dec</td>
<td>Mar-Dec</td>
<td>10-15m</td>
<td>8-12m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>36</td>
<td>Ficus virels</td>
<td>大葉榕, 黃葛樹</td>
<td>MORACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Apr-Oct</td>
<td>Apr-Oct</td>
<td>15-20m</td>
<td>17-22m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>37</td>
<td>Garomia subelliptica</td>
<td>珍貴福木</td>
<td>CLUSIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Aug</td>
<td>Sep-Dec</td>
<td>3-5m</td>
<td>2-4m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>38</td>
<td>Hyophorbe lagenicaulis</td>
<td>酒瓶椰子</td>
<td>ARECACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Mar-May</td>
<td>Jul-Aug</td>
<td>3-5m</td>
<td>2-4m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>39</td>
<td>Ilex rotunda var. microcarpa</td>
<td>小果鐵冬青</td>
<td>AQUIFOLIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Mar-May</td>
<td>Oct-Nov</td>
<td>4-8m</td>
<td>3-6m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>40</td>
<td>Juniperus chinensis ‘Kaizuka’</td>
<td>龍柏</td>
<td>CUPRESSACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Mar-Apr</td>
<td>Oct-Jan</td>
<td>5-7m</td>
<td>1-2m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>41</td>
<td>Khaya senegalensis</td>
<td>吊米樑</td>
<td>MELIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Apr-Jun</td>
<td>Apr-Jun</td>
<td>20-25m</td>
<td>15-20m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>42</td>
<td>Koelreuteria elegans subsp. formosana</td>
<td>出糠樹</td>
<td>SAPINDACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>Jun-Jul</td>
<td>Sept-Oct</td>
<td>15-25m</td>
<td>15-20m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>43</td>
<td>Liquidambar formosana</td>
<td>櫟樹</td>
<td>HAMAMELIDACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Mar-Jun</td>
<td>Jul-Sep</td>
<td>20-30m</td>
<td>15-20m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>44</td>
<td>Lithsea glutinosa</td>
<td>簸穀樹</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>May-Jun</td>
<td>Sept-Oct</td>
<td>10-15m</td>
<td>8-12m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>45</td>
<td>Lithsea monopetala</td>
<td>橡枝木屑子, 橡枝樹</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Nov-Jun</td>
<td>Jun-Jul</td>
<td>12-18m</td>
<td>5-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>No.</td>
<td>Botanical name</td>
<td>Chinese description</td>
<td>Family name</td>
<td>Provenance</td>
<td>Deciduous/ Evergreen</td>
<td>Flowering period</td>
<td>Fruiting period</td>
<td>Height</td>
<td>Canopy Spread</td>
<td>Sunlight preference</td>
<td>Tree contains poisonous parts</td>
</tr>
<tr>
<td>-----</td>
<td>----------------</td>
<td>---------------------</td>
<td>-------------</td>
<td>------------</td>
<td>---------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>46</td>
<td>Machilus breviflora</td>
<td>短序潤楠, 短花楠</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jul-Aug</td>
<td>Oct-Dec</td>
<td>8-12m</td>
<td>6-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>47</td>
<td>Machilus chekiangensis</td>
<td>浙江潤楠</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Feb</td>
<td>Apr-May</td>
<td>7-15m</td>
<td>6-12m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>48</td>
<td>Machilus chinensis</td>
<td>華潤楠, 香港楠</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Sept</td>
<td>Feb</td>
<td>8-10m</td>
<td>5-7m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>49</td>
<td>Machilus velutina</td>
<td>短毛潤楠</td>
<td>LAURACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Oct-Dec</td>
<td>Feb-Mar</td>
<td>15-18m</td>
<td>7-12m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>50</td>
<td>Melia azedarach</td>
<td>梿, 苦楝</td>
<td>MELIACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>Apr-May</td>
<td>Oct-Dec</td>
<td>15-20m</td>
<td>15-20m</td>
<td>full sun to partial shade</td>
<td>✓</td>
</tr>
<tr>
<td>51</td>
<td>Michelia champaca</td>
<td>黃蘭</td>
<td>MAGNOLIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Jun-Jul</td>
<td>Sep-Oct</td>
<td>10-12m</td>
<td>6-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>52</td>
<td>Microcos nervosa</td>
<td>紅椎栗</td>
<td>TILIACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jun-Jul</td>
<td>Aug-Oct</td>
<td>8-12m</td>
<td>5-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>53</td>
<td>Nageia nagi</td>
<td>竹柏</td>
<td>PODOCARPACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Mar-May</td>
<td>Aug-Nov</td>
<td>10-12m</td>
<td>6-8m</td>
<td>partial shade</td>
<td>-</td>
</tr>
<tr>
<td>54</td>
<td>Palaquium formosanum</td>
<td>台灣膠木</td>
<td>SAPOTACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Sept-May</td>
<td>Jun-Oct</td>
<td>12-20m</td>
<td>10-15m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>55</td>
<td>Peltophorum tonkinense</td>
<td>銀珠</td>
<td>CAESALPINIACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>Mar-Jun</td>
<td>Jul-Oct</td>
<td>15-20m</td>
<td>8-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>56</td>
<td>Phoenix dactylifera</td>
<td>海棗, 棗椰樹</td>
<td>ARECACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Apr</td>
<td>Sep-Oct</td>
<td>10-30m</td>
<td>3-12m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>57</td>
<td>Plumeria rubra</td>
<td>鳳凰木</td>
<td>APOCYNACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>Mar-May</td>
<td>May-Dec</td>
<td>5-8m</td>
<td>6-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>58</td>
<td>Podocarpus macrophyllus</td>
<td>紅椎松</td>
<td>PODOCARPACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Apr-May</td>
<td>Aug-Sept</td>
<td>10-15m</td>
<td>3-6m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>59</td>
<td>Polyalthia longifolia</td>
<td>長葉暗羅</td>
<td>ANNONACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-May</td>
<td>Jun-Sep</td>
<td>10-15m</td>
<td>2-3m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>60</td>
<td>Polyspora axillaris</td>
<td>大頭茶</td>
<td>THEACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Sept-Oct</td>
<td>Nov-Dec</td>
<td>5-8m</td>
<td>3-5m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>61</td>
<td>Pongamia pinnata</td>
<td>水黃皮</td>
<td>FABACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>May-Jun</td>
<td>Aug-Oct</td>
<td>10-15m</td>
<td>10-15m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>62</td>
<td>Pterocarpus indicus</td>
<td>樟樹</td>
<td>FABACEAE</td>
<td>Exotic</td>
<td>Semi-Deciduous</td>
<td>Feb-Aug</td>
<td>Nov</td>
<td>15-20m</td>
<td>15-20m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>63</td>
<td>Pterospermum heterophyllum</td>
<td>蘭白果樹</td>
<td>STERCULIACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Sep-Nov</td>
<td>Oct-Nov</td>
<td>15-18m</td>
<td>8-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>64</td>
<td>Radpermachera hainanensis</td>
<td>紅背豆樹</td>
<td>BIGNONIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Apr</td>
<td>May-Jun</td>
<td>13-20m</td>
<td>5-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>65</td>
<td>Rhiz hypoicosa</td>
<td>白背羅望子</td>
<td>ANACARDIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Jun-Aug</td>
<td>Sept-Nov</td>
<td>2-5m</td>
<td>2-3m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>66</td>
<td>Sapindus saponaria</td>
<td>木患子</td>
<td>SAPINDACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Mar-May</td>
<td>Jun-Nov</td>
<td>10-20m</td>
<td>12-16m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>67</td>
<td>Sapium disclor</td>
<td>山麻樹</td>
<td>EUPHORBIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Apr-Jun</td>
<td>July-Oct</td>
<td>5-12m</td>
<td>8-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>68</td>
<td>Sapium sebiferum</td>
<td>菜柏</td>
<td>EUPHORBIACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Apr-Aug</td>
<td>Aug-Nov</td>
<td>12-17m</td>
<td>8-10m</td>
<td>full sun to partial shade</td>
<td>✓</td>
</tr>
</tbody>
</table>
## Appendix B - Tree Selection Criteria Rating

<table>
<thead>
<tr>
<th>No.</th>
<th>Botanical name</th>
<th>Chinese description</th>
<th>Family name</th>
<th>Provenance</th>
<th>Deciduous/ Evergreen</th>
<th>Flowering period</th>
<th>Fruiting period</th>
<th>Height</th>
<th>Canopy Spread</th>
<th>Sunlight preference</th>
<th>Tree contains poisonous parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>Schima superba</td>
<td>木荷, 胭脂</td>
<td>THEACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jun-Aug</td>
<td>Oct-Dec</td>
<td>10-20m</td>
<td>8-10m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>70</td>
<td>Senna spectabilis</td>
<td>美麗決明, 美洲槐</td>
<td>CAESALPINIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Apr</td>
<td>Jul-Sept</td>
<td>8-10m</td>
<td>8-12m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>71</td>
<td>Swietenia mahagoni</td>
<td>桃花心木</td>
<td>MELIACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>May-Jun</td>
<td>Oct-Nov</td>
<td>20-25m</td>
<td>18-22m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>72</td>
<td>Syzygium cumini</td>
<td>香墨, 海南蒲桃</td>
<td>MYRTACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Feb-May</td>
<td>Jun-Sept</td>
<td>12-15m</td>
<td>8-10m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>73</td>
<td>Syzygium hancei</td>
<td>嫚氏蒲桃, 红蠹蒲桃</td>
<td>MYRTACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jul-Sept</td>
<td>Nov-Jan</td>
<td>8-10m</td>
<td>5-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>74</td>
<td>Syzygium jambos</td>
<td>蒲桃</td>
<td>MYRTACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Mar-Apr</td>
<td>May-Jun</td>
<td>7-12m</td>
<td>5-8m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>75</td>
<td>Syzygium leucodendron</td>
<td>恒春黄槿</td>
<td>MALVACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jul-Sept</td>
<td>Feb-May</td>
<td>10-15m</td>
<td>8-12m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>76</td>
<td>Theophrastus punica</td>
<td>山蒲桃</td>
<td>MALVACEAE</td>
<td>Native</td>
<td>Evergreen</td>
<td>Jan-Dec</td>
<td>Jan-Dec</td>
<td>6-8m</td>
<td>5-10m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>77</td>
<td>Ulmus parvifolia</td>
<td>榆桐</td>
<td>ULMACEAE</td>
<td>Exotic</td>
<td>Deciduous</td>
<td>Aug-Oct</td>
<td>Aug-Oct</td>
<td>12-25m</td>
<td>18-22m</td>
<td>full sun to partial shade</td>
<td>-</td>
</tr>
<tr>
<td>78</td>
<td>Wodyetia bifurcata</td>
<td>狐尾椰子</td>
<td>ARECACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>May-Jul</td>
<td>Aug-Sept</td>
<td>10-20m</td>
<td>4-6m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>79</td>
<td>Xanthostemon chrysantha</td>
<td>金蒲桃</td>
<td>MYRTACEAE</td>
<td>Exotic</td>
<td>Evergreen</td>
<td>Nov-Feb</td>
<td>Mar-May</td>
<td>10-20m</td>
<td>4-8m</td>
<td>full sun</td>
<td>-</td>
</tr>
<tr>
<td>80</td>
<td>Zanthoxylum avicennae</td>
<td>勺椏花樹, 荔椏</td>
<td>RUTACEAE</td>
<td>Native</td>
<td>Deciduous</td>
<td>Jun-Aug</td>
<td>Oct-Dec</td>
<td>8-15m</td>
<td>5-8m</td>
<td>full sun</td>
<td>✓</td>
</tr>
</tbody>
</table>
### Rating of Selection Criteria for Tree Species

<table>
<thead>
<tr>
<th>No.</th>
<th>Botanical name</th>
<th>Chinese description</th>
<th>Selection Criteria</th>
<th>Essential Attributes</th>
<th>Valued Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Climate Resilience</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Life-Cycle Planning</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Adenanthera microsperma</td>
<td>海红豆, 九翅豆</td>
<td>M M M H H H H M M H H M H</td>
<td>H H H H H M M M H</td>
<td>M M H M M H M M H</td>
</tr>
<tr>
<td>2</td>
<td>Arenga pinnata</td>
<td>椰糖椰子, 椰樹</td>
<td>M M M M M H H H H M</td>
<td>M - H H M M M M</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>3</td>
<td>Albizia jubiflora</td>
<td>合歡</td>
<td>M M M M M H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>4</td>
<td>Aporosa dioica</td>
<td>銀柴, 大沙葉</td>
<td>M M M H H H H H H M</td>
<td>M M M H H M M</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>5</td>
<td>Bixa orellana</td>
<td>紅木</td>
<td>H M M H M H H H M</td>
<td>H H H H M M M</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>6</td>
<td>Brachychiton acerifolius</td>
<td>樟葉朴</td>
<td>M M M M M H H H M</td>
<td>H H H H M M M</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>7</td>
<td>Bridelia tomentosa</td>
<td>砂糖椰子, 椰樹</td>
<td>M M M M M H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>8</td>
<td>Caesalpinia ferrea</td>
<td>巴西鐵木</td>
<td>M M M M M H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>9</td>
<td>Cassia javanica var. indochinensis</td>
<td>傳果決明</td>
<td>M M M M M H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>10</td>
<td>Celtis timorensis</td>
<td>九厘木, 櫸木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>11</td>
<td>Cheesopsondias avinari</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>12</td>
<td>Chukrasia tabularis</td>
<td>優木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>13</td>
<td>Cinnamomum parthenoxylon</td>
<td>黃樟</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>14</td>
<td>Cleistocalyx nervosum</td>
<td>水柏</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>15</td>
<td>Cordia dichotoma</td>
<td>雙花木</td>
<td>M M M M M M M M</td>
<td>M M M M M H H</td>
<td>M M M M M H L</td>
</tr>
<tr>
<td>16</td>
<td>Crateva unilocularis</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>17</td>
<td>Diacayia mollis</td>
<td>豬肝木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>18</td>
<td>Diospyros morrisiana</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>19</td>
<td>Dicostelium dichotoma</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>20</td>
<td>Dipteryx odorata</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>21</td>
<td>Dipteryx odora</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>22</td>
<td>Dimea Geoffroyana</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>23</td>
<td>Dipteryx odorata</td>
<td>紅木</td>
<td>M M M H H H H H H M</td>
<td>M M M M M H M H</td>
<td>M M M M M H M</td>
</tr>
<tr>
<td>No.</td>
<td>Botanical name</td>
<td>Chinese description</td>
<td>Selection Criteria*</td>
<td>Essential Attributes</td>
<td>Valued Attributes</td>
</tr>
<tr>
<td>-----</td>
<td>----------------</td>
<td>---------------------</td>
<td>---------------------</td>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>24</td>
<td>Ehretia longiflora</td>
<td>長花厚殼樹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Elaeocarpus apiculatus</td>
<td>長芒杜英, 東葉杜英</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Elaeocarpus chinensis</td>
<td>中華杜英</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Elaeocarpus hainanensis</td>
<td>水石榕</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Elaeocarpus japonicus</td>
<td>日本杜英</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Ficus altissima</td>
<td>高山榕, 雞榕</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Ficus binnendijkii</td>
<td>阿里垂榕</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Ficus fistulosa</td>
<td>水同木</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Ficus lyrata</td>
<td>大琴葉榕</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Ficus religiosa</td>
<td>菩提樹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Ficus subpisocarpa</td>
<td>笔管榕</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Ficus variegata</td>
<td>青果榕</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Ficus virens</td>
<td>大葉榕, 黃葛樹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Garcinia subelliptica</td>
<td>菲島福木</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Hyophorbe lagenicaulis</td>
<td>酒瓶椰子</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Ilex rotunda var. microcarpa</td>
<td>小果鐵冬青</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Juniperus chinensis 'Kaizuka'</td>
<td>龍柏</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Khaya senegalensis</td>
<td>非洲楝</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Koelreuteria elegans subsp. formosana</td>
<td>台灣欒樹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Liquidambar formosana</td>
<td>楓香</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Litsea glutinosa</td>
<td>蛲樹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Litsea monopetala</td>
<td>蝴蝶木薑子, 蝴蝶樹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Machilus breviflora</td>
<td>短序闊橈, 短花橈</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Appendix B - Tree Selection Criteria Rating

<table>
<thead>
<tr>
<th>No.</th>
<th>Botanical name</th>
<th>Chinese description</th>
<th>Selection Criteria</th>
<th>Essential Attributes</th>
<th>Value Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Climate Resilience</td>
<td>Urban soil adaptability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Drought Tolerance</td>
<td>Soil compaction tolerance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Waterlogging Tolerance</td>
<td>Soil volume tolerance (tree urban environment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Urban Useful Life Efficiency</td>
<td>pH of Soil (Range)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wind Tolerance</td>
<td>Root system (manageability)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Manageability</td>
<td>Soil volume tolerance (for urban environment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Crown management</td>
<td>pH of Soil (Range)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pest &amp; Disease Resistance</td>
<td>Soil volume tolerance (for urban environment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Roadside Pollution Tolerance</td>
<td>pH of Soil (Range)</td>
</tr>
<tr>
<td>47</td>
<td>Machilus chekiangensis</td>
<td>浙江润楠</td>
<td></td>
<td>H H H H H H H M M M L M M H H H</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Machilus chinensis</td>
<td>紫润楠, 香港楠</td>
<td></td>
<td>M H M H H H H H M H H H H H M M M</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Machilus velutina</td>
<td>红毛润楠</td>
<td></td>
<td>M H H H H H H H H M M M L H H H M H</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Melia azedarach</td>
<td>糖, 娓梅</td>
<td></td>
<td>H H M M M M M H H H H M H L H H H M M H</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Michelia champaca</td>
<td>黄楠</td>
<td></td>
<td>M M H H H H H H H M H H H M M M M</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Microcos nervosa</td>
<td>桂木</td>
<td></td>
<td>M M M H H H H H H M H H H H H H M M</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Nageia nagi</td>
<td>竹柏</td>
<td></td>
<td>M M M H H H H H H M M L H H M M M M</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Palasium formosanum</td>
<td>甜雅榈木</td>
<td></td>
<td>M M M M H H H H H M M L L H H M H</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Pterocarpus borkinense</td>
<td>铁木</td>
<td></td>
<td>M M M H H H H H H L M M H L H H M H M</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Phoenix dactylifera</td>
<td>槿, 雄凰树</td>
<td></td>
<td>H H M H H H H H H M - M H L H H M H M L</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Plumeria rubra</td>
<td>喜美花, 红鸡蛋花</td>
<td></td>
<td>H M M H M M H H H H M H H M M M H M</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Podocarpus macrophyllus</td>
<td>罗汉松</td>
<td></td>
<td>H H M H M H H H H H H M H M M M H H L</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Polyalthia longifolia</td>
<td>长叶被藤</td>
<td></td>
<td>H M M H M H H H H H M M H M M M M</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Polyspora axillaris</td>
<td>多特木</td>
<td></td>
<td>M M M M H H H H H H M M M L L H H L</td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Pongamia pinnata</td>
<td>水黄皮</td>
<td></td>
<td>M M H M M M M M H M H L L L H M H H H</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Pterocarpus indicus</td>
<td>新樟</td>
<td></td>
<td>M M M H M M M M M H L M M L L H M H H M</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Pterospermum heterophyllum</td>
<td>槟白果树</td>
<td></td>
<td>M H M H H M H H L M L H M M H M M M M</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Radermachera hainanensis</td>
<td>海南木豆树</td>
<td></td>
<td>H H M H H H H H H L M M H M M M M</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Rhoe hypoleuca</td>
<td>白背薯蓣</td>
<td></td>
<td>H M M H H H H H M M M M M M H L L L</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Sapindus saponaria</td>
<td>柿子, 水果子</td>
<td></td>
<td>H H M M M M M M M H L L L H H H H H</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Sapindus discolor</td>
<td>栗白</td>
<td></td>
<td>M M M M M M M M M H L M M M M M H H M</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Sapindus sibthorombe</td>
<td>荣阳</td>
<td></td>
<td>M M H M M M M M L M M L M M M M</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Schima superba</td>
<td>木荷, 纱树</td>
<td></td>
<td>M H H H H H H H H M M H M L M M H H M</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix B - Tree Selection Criteria Rating

<table>
<thead>
<tr>
<th>No.</th>
<th>No.</th>
<th>Botanical name</th>
<th>Chinese description</th>
<th>Selection Criteria*</th>
<th>Essential Attributes</th>
<th>Valued Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>70</td>
<td>Senna spectabilis</td>
<td>美麗決明, 美洲槐</td>
<td>M M M H M H M</td>
<td>M M M M M M</td>
<td>M M M M M M</td>
</tr>
<tr>
<td>71</td>
<td>71</td>
<td>Swietenia mahagoni</td>
<td>核花心木</td>
<td>M M M H H H</td>
<td>M L M M L M H L</td>
<td>M H</td>
</tr>
<tr>
<td>72</td>
<td>72</td>
<td>Syzygium cumini</td>
<td>商墨, 海樹蒲桃</td>
<td>M H M H H M</td>
<td>L M H M M M M H</td>
<td>M</td>
</tr>
<tr>
<td>73</td>
<td>73</td>
<td>Syzygium hancei</td>
<td>韓氏蒲桃, 紅樹蒲桃</td>
<td>M H M H H H</td>
<td>L M M M M M M H</td>
<td>M</td>
</tr>
<tr>
<td>74</td>
<td>74</td>
<td>Syzygium jambos</td>
<td>鹽桃</td>
<td>M M H H H M</td>
<td>M H M M M M M</td>
<td>M M</td>
</tr>
<tr>
<td>75</td>
<td>75</td>
<td>Syzygium levinei</td>
<td>山蒲桃</td>
<td>M H M H H M</td>
<td>M H M M M M M</td>
<td>M H</td>
</tr>
<tr>
<td>76</td>
<td>76</td>
<td>Theopsea populnea</td>
<td>丹霞黃楝, 盤檀</td>
<td>M H H M M M</td>
<td>M M M L M M M</td>
<td>M M</td>
</tr>
<tr>
<td>77</td>
<td>77</td>
<td>Ulmus parvifolia</td>
<td>楸榆</td>
<td>M M M H H H H</td>
<td>M H H M M M M</td>
<td>M</td>
</tr>
<tr>
<td>78</td>
<td>78</td>
<td>Wodyetia bifurcata</td>
<td>狐尾棕子</td>
<td>M M M H H H H</td>
<td>M - H H M M M L M</td>
<td>L L</td>
</tr>
<tr>
<td>79</td>
<td>79</td>
<td>Xanthostemon chrysanthus</td>
<td>金膝桃</td>
<td>M M M M H H H H</td>
<td>H M M M M M M</td>
<td>H L</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>Zanthoxylum avicennae</td>
<td>烏皮花椒, 烏皮</td>
<td>M H M H H H H</td>
<td>M M M H M M M</td>
<td>H M</td>
</tr>
</tbody>
</table>

* Refer to Appendix B - Explanation for Selection Criteria Ratings
Appendix C. Maintenance Requirements at Different Phases of Trees’ Life-cycle
Appendix C – Maintenance Requirements at Different Phases of Trees’ Life-cycle

Seed Propagation

Type of Seed (N / F)

(N) - Naked seed is the seed borne by Gymnosperms woody plant (non-flowering seed plants) such as cedar, pine, redwood, hemlock, and firs. These seeds are best to be sowed in late winter. Giving the seeds a short cold stratification can aid in germination rate.

(F) - Fleshy seed is the seed enclosed in a protective covering called a fruit that borne by Angiosperms plants. The fleshy fruit needs to removed as much as possible and wash with fresh water. If the fruit is a seed pod, allow the pods to split open naturally by laying them in a semi-shaded area.

Seed Pre-treatment (0 / +1 / - )

(0) – Yes, pretreatment is required for seed immediately after harvesting before sowing. Pretreatment may include Mechanical treatment, Water treatment, Temperature treatment, Chemical treatment in order to improve germination rate, accelerate the germination process and improve seed growth.

(+1) – Yes, pretreatment is required for seed within one year of harvesting before sowing. Pretreatment may include, Mechanical treatment, Water treatment, Temperature treatment, Chemical treatment in order to improve germination rate, accelerate the germination process and improve seed growth.

(-) – No, pretreatment is not required.

Non-Seed Propagation

Cutting (Y / - )

(Y) – Yes, propagation through cutting is viable

(-) – No, propagation not viable by cutting or unknown.

Layering (Y / - )

(Y) – Yes, propagation through layering is viable

(-) – No, propagation not viable by layering or unknown.

Grafting (Y / - )

(Y) – Yes, propagation through grafting is viable

(-) – No, propagation not viable by grating or unknown.
Appendix C – Maintenance Requirements at Different Phases of Trees’ Life-cycle

**Thinning out (Y / -)**

(Y) – Yes, thinning out required for small seeds with direct sowing only
(-) – No, thinning out is not required or unknown.

**Tree Staking (L / M / H)**

To stabilize newly planted tree, sometimes tree staking is used to protect young trees from mechanical damage and to reduce vandalism and theft. Tree staking needs to be checked and adjusted regularly.

(L) – Low maintenance – tree staking is not required
(M) - Medium maintenance – tree staking is required for one growing season;
(H) - High maintenance – tree staking is required more than one growing season.

**Pest/Disease Control (L / H)**

(L) - Low maintenance - Pest/disease control inspection is required every six months.
Pesticides should be applied if necessary.
(H) - High maintenance - Pest/disease control inspection is required every three months.
Pesticides should be applied if necessary.

**Formative Pruning (L / M / H)**

(L) - Low maintenance – formative pruning is not required (tree form with single main leader naturally)
(M) - Medium maintenance – light formative pruning is required (Tree tends to develop co-dominant leaders)
(H) – High maintenance – moderate formative pruning is required. (Tree tends to develop more than 2 nos. of multiple leaders)

**Irrigation (L / M / H)**

(L) - Low maintenance – Low demand of irrigation. Tree can tolerate dry spell ≥ 2 months without supplementary irrigation
(M) - Medium maintenance - Medium demand of irrigation. Tree can tolerate ≥ 1 month without supplementary irrigation
(H) - High maintenance– High demand of irrigation. Tree can tolerate < 1 month without supplementary irrigation
Appendix C – Maintenance Requirements at Different Phases of Trees’ Life-cycle

**Fertilization**

*Type (N / P / K / Mg)*

Emphasis on particular nutrient in fertilizer ratio.

- **(N)** – Nitrogen
- **(P)** – Phosphorous
- **(K)** – Potassium
- **(Mg)** – Magnesium

*Period of Application (L / F)*

- **(L)** – apply fertilizer when leaves are budding, usually early spring
- **(F)** – apply fertilizer before flower budding

**Tree Inspection & Risk Assessment (L / H)**

- **(L)** - Low maintenance – annual inspection for tree with slow to moderate growth rate / trees with higher wind tolerance / small size
- **(H)** - High maintenance – inspection at every 6 months for tree with a fast growth rate / large tree with low wind tolerance / tree with weaker root system

**Tree Protection (Y / -)**

- **(Y)** Yes, tree protection is required due to large tree with low wind tolerance / tree with weaker root system
- **(-)** No, tree protection is not required due to higher wind tolerance / small tree size / lighter foliage density

**Tree Pruning**

- **(L)** - Low maintenance – slow growing tree species seldom require pruning
- **(M)** - Medium maintenance – moderate growers do not often require pruning
- **(H)** - High maintenance – fast growers need to be pruned often.

**Roots Management (L / M / H)**

- **(L)** - Low maintenance – tree seldom require root or aerial root pruning
- **(M)** - Medium maintenance – tree do not often require root or aerial root pruning
- **(H)** - High maintenance – tree often require root or aerial root pruning.
## Appendix C – Maintenance Requirements at Different Phases of Trees’ Life-cycle

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific Name</th>
<th>Chinese Name</th>
<th>Period of Application</th>
<th>Type of Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adenanthera microsperma</td>
<td>麻楝</td>
<td>5-8</td>
<td>Propagation to Seedling</td>
</tr>
<tr>
<td>2</td>
<td>Acacia auriculiformis</td>
<td>長芒杜英</td>
<td>9-70</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>3</td>
<td>Alnus japonica</td>
<td>日本杜英</td>
<td>9-40</td>
<td>Pruning, Fertilization, Disease/Insect Control</td>
</tr>
<tr>
<td>4</td>
<td>Araucaria heterophylla</td>
<td>合歡</td>
<td>9-40</td>
<td>Pest/Disease Control</td>
</tr>
<tr>
<td>5</td>
<td>Beilschmiedia taxiflora</td>
<td>大琴葉榕</td>
<td>5-8</td>
<td>Watering, Fertilization, Pest/Disease Control</td>
</tr>
<tr>
<td>6</td>
<td>Butea monosperma</td>
<td>紅木</td>
<td>11-70</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>7</td>
<td>Calliandra prostrata</td>
<td>土蜜樹</td>
<td>5-8</td>
<td>Propagation to Seedling</td>
</tr>
<tr>
<td>8</td>
<td>Cassia alata</td>
<td>大約樹</td>
<td>5-8</td>
<td>Pruning, Fertilization</td>
</tr>
<tr>
<td>9</td>
<td>Canella communis</td>
<td>逼迫仔</td>
<td>9-50</td>
<td>Propagation to Seedling</td>
</tr>
<tr>
<td>10</td>
<td>Cambium, cinnamomum</td>
<td>茶樹</td>
<td>9-50</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>11</td>
<td>Campsis javanica var. indica</td>
<td>日本繡球</td>
<td>5-8</td>
<td>Propagation to Seedling</td>
</tr>
<tr>
<td>12</td>
<td>Capparis decidua</td>
<td>紅木</td>
<td>5-8</td>
<td>Pruning, Fertilization</td>
</tr>
<tr>
<td>13</td>
<td>Chorisia speciosa</td>
<td>麻楝</td>
<td>6-10</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>14</td>
<td>Chrysochroa flava</td>
<td>銀柴</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>15</td>
<td>Chrysochroa flavescens</td>
<td>紫花</td>
<td>5-8</td>
<td>Propagation to Seedling</td>
</tr>
<tr>
<td>16</td>
<td>Chlorophytum comosum</td>
<td>紅木</td>
<td>5-8</td>
<td>Pruning, Fertilization</td>
</tr>
<tr>
<td>17</td>
<td>Clerodendrum philippinum</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>18</td>
<td>Clerodendrum trichotomum</td>
<td>長芒杜英</td>
<td>5-8</td>
<td>Pruning, Fertilization</td>
</tr>
<tr>
<td>19</td>
<td>Clerodendron trichotomum</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>20</td>
<td>Cyrtodendron aduncum</td>
<td>日本栢</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>21</td>
<td>Cyberophyllum auriculatum</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>22</td>
<td>Cydonia oblonga</td>
<td>日本棗</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>23</td>
<td>Dacrydium cupressinum</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>24</td>
<td>Dacrydium cupressinum</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>25</td>
<td>Deigo glabrous</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>26</td>
<td>Deigo glabrous</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>27</td>
<td>Deigo glabrous</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>28</td>
<td>Deigo glabrous</td>
<td>麻楝</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>29</td>
<td>Fallopia japonica</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>30</td>
<td>Fallopia japonica</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>31</td>
<td>Fallopia japonica</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>32</td>
<td>Fallopia japonica</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
<tr>
<td>33</td>
<td>Fallopia japonica</td>
<td>水翁</td>
<td>5-8</td>
<td>Foliage Treatment</td>
</tr>
</tbody>
</table>

### Life cycle pattern (year)
- Seed Propagation
- Non-Seed Propagation
- Sapling to Semi-mature
- Mature
- Senescence

### Propagation to Seedling
- Type of Seed
- Seed Propagation
- Caching
- Germinating
- Thinning out
- Tree-Silking
- Pest/Disease control
- Fertilization
- Tree-Pruning

### Sapling to Semi-mature
- Type of Plant
- Pest/Disease Control
- Fertilization
- Tree-Pruning

### Mature
- Type of Plant
- Pest/Disease Control
- Fertilization
- Tree-Pruning

### Senescence
- Type of Plant
- Pest/Disease Control
- Fertilization
- Tree-Pruning

### Maintenance Operations at Different Stages of the Life-cycle
- Propagation to Seedling
- Sapling to Semi-mature
- Mature
- Senescence

### Type of Maintenance
- Tree Inspection & Risk Assessment
- Foliage Treatment
- Fertilization
- Tree-Pruning

### Period of Application
- 1-4 months
- 5-10 months
- 11-15 months
- 16-20 months
- 21-25 months
- 26-30 months
- 31-35 months
- 36-40 months
- 41-45 months
- 46-50 months
- 51-55 months
- 56-60 months
- 61-65 months
- 66-70 months
- 71-75 months
- 76-80 months
- 81-85 months
- 86-90 months
- 91-95 months
- 96-100 months
### Appendix C – Maintenance Requirements at Different Phases of Trees’ Life-cycle

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific Name</th>
<th>Chinese Name</th>
<th>Life Cycle Pattern (Year)</th>
<th>Propagation to Seedling</th>
<th>Sapling to Semi-mature</th>
<th>Maintenance Operations at Different Stages of the Life-cycle</th>
<th>Senescence</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>Ficus subcordata</td>
<td>非洲楝</td>
<td>1-5</td>
<td>4-10</td>
<td>11-70</td>
<td>71-80</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Ficus variegata</td>
<td>嘉應樹</td>
<td>1-5</td>
<td>4-10</td>
<td>11-70</td>
<td>71-80</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Ficus variegata</td>
<td>非洲榕</td>
<td>1-5</td>
<td>4-10</td>
<td>11-40</td>
<td>81-100</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Sargentia hodgsonii</td>
<td>桃園楓</td>
<td>1-5</td>
<td>4-10</td>
<td>11-60</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Uvaria hirsuta</td>
<td>海棗</td>
<td>1-5</td>
<td>6-10</td>
<td>61-70</td>
<td>41-70</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Acrocomia var. microcarpa</td>
<td>楓香</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>61-70</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Laportea chinensis var. yunnanica</td>
<td>青果榕</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>61-70</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Ficus nitida</td>
<td>非洲楝</td>
<td>1-5</td>
<td>6-10</td>
<td>61-70</td>
<td>71-80</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Antiaris africana var. formosana</td>
<td>紫檀</td>
<td>1-5</td>
<td>10-15</td>
<td>51-60</td>
<td>41-50</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Laportea formosana</td>
<td>楓香</td>
<td>1-5</td>
<td>5-10</td>
<td>61-70</td>
<td>71-80</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Ulmus pumila</td>
<td>非洲楓</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>61-80</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Ulmus rubra</td>
<td>非洲楓</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Machilus inclinata</td>
<td>毛葉楠</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>41-70</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Machilus chinensis var. yunnanica</td>
<td>縱葉暗羅</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>61-70</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Machilus chinensis</td>
<td>縱葉暗羅</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>61-70</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Machilus vekula</td>
<td>毛葉楠</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>41-50</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Melia azedarach</td>
<td>京楠</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>41-50</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Callicarpa chinensis</td>
<td>野梨</td>
<td>1-5</td>
<td>6-10</td>
<td>61-70</td>
<td>71-80</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Memecylaceae var.</td>
<td>野梨</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Pipturus raptis</td>
<td>野梨</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Platanus acerifolia</td>
<td>山龍眼</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>41-50</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Platanus orientalis</td>
<td>山龍眼</td>
<td>1-5</td>
<td>6-10</td>
<td>61-70</td>
<td>71-80</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Phoenix dactylifera</td>
<td>菠蘿梨</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>41-50</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>81-100</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Pterocarpus macrophyllus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-40</td>
<td>81-100</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Pterocarpus superbus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Pterocarpus indicus</td>
<td>柚木</td>
<td>1-5</td>
<td>6-10</td>
<td>61-50</td>
<td>51-60</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Scientific Name</td>
<td>Chinese Name</td>
<td>Life cycle pattern (year)</td>
<td>Propagation to Seedling</td>
<td>Sapling to Semi-mature</td>
<td>Mature</td>
<td>Senescence</td>
</tr>
<tr>
<td>-----</td>
<td>----------------</td>
<td>---------------</td>
<td>--------------------------</td>
<td>-------------------------</td>
<td>------------------------</td>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>67</td>
<td>Sapium discolor</td>
<td>山烏桕</td>
<td>1-3</td>
<td>4-10</td>
<td>11-40</td>
<td>41-50</td>
<td>F</td>
</tr>
<tr>
<td>68</td>
<td>Sapium sebiferum</td>
<td>烏桕</td>
<td>1-3</td>
<td>4-10</td>
<td>11-40</td>
<td>41-50</td>
<td>Y</td>
</tr>
<tr>
<td>69</td>
<td>Schima superba</td>
<td>木荷，荷樹</td>
<td>1-5</td>
<td>6-10</td>
<td>16-40</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>70</td>
<td>Senna spectabilis</td>
<td>美麗決明，美洲槐</td>
<td>1-3</td>
<td>4-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>71</td>
<td>Swietenia mahagoni</td>
<td>桃花心木</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>72</td>
<td>Syzygium cumini</td>
<td>烏墨，海南蒲桃</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>73</td>
<td>Syzygium hancei</td>
<td>韓氏蒲桃，紅鱗蒲桃</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>74</td>
<td>Syzygium jambos</td>
<td>蒲桃</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>75</td>
<td>Syzygium levinei</td>
<td>山蒲桃</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>76</td>
<td>Thespesia populnea</td>
<td>恒春黃槿，繖楊</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>77</td>
<td>Ulmus parvifolia</td>
<td>榔榆</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
<tr>
<td>78</td>
<td>Wodyetia bifurcata</td>
<td>狐尾椰子</td>
<td>1-5</td>
<td>6-15</td>
<td>16-50</td>
<td>51-70</td>
<td>F</td>
</tr>
</tbody>
</table>
Appendix D. Suitable Tree Species for each Street Typology
## Suitable Tree Species for each Street Typology

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific name</th>
<th>Chinese description</th>
<th>Suitable Street Type</th>
<th>Street Sub-type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>CMGZ (Wide)</td>
<td>CMGZ (Narrow)</td>
</tr>
<tr>
<td>1</td>
<td>Adenanthera macrophylla</td>
<td>海紅豆，孔達豆</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Aronga jinnali</td>
<td>砂糖棗，梧桐</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Albizia julibrissin</td>
<td>合歡樹</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Aphanoe diossea</td>
<td>聞香，大沙薢</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ficus orinana</td>
<td>紅木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Brachychiton acerifolius</td>
<td>城區瀟疏</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Butea monosperma</td>
<td>土石榴，石榴仔</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cassia javanica var. javanica</td>
<td>巴西鐵木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Catha barbatula</td>
<td>竹節樹</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Cassia x reallii</td>
<td>彩虹南酸</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Cissus javanica var. javanica</td>
<td>四果決明</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Gleditsia atkamica</td>
<td>面目茄，復葉木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Cocos nucifera</td>
<td>面目茄，復葉木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Guarea tabularis</td>
<td>薰檀</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Grevillea robusta</td>
<td>黃檀</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Gleditsia robusta</td>
<td>黃檀</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Cordia alliodora</td>
<td>韓木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Choisya ternata</td>
<td>香蘭</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Cinnamomum arborescens</td>
<td>格蘭登樹</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Cordia volubilis</td>
<td>韓木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Dieffenbachia assamica</td>
<td>南蓮真槿</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Diospyros kaki</td>
<td>荔枝树</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Dracaena forbesii</td>
<td>紫霓草</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Euclea sigillata</td>
<td>花香黎藤</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Dipteryx paniculata</td>
<td>烏木</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Dillenia reticulata</td>
<td>尖葉杜英</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Dillenia mollisima</td>
<td>尖葉杜英</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Dillenia indica</td>
<td>尖葉杜英</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Diospyros kaki</td>
<td>荔枝树</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

17/7/2018
<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific name</th>
<th>Chinese description</th>
<th>Suitable Street Type</th>
<th>CMEZ (Wide)</th>
<th>CMEZ (Narrow)</th>
<th>A1</th>
<th>A2</th>
<th>B1</th>
<th>B2</th>
<th>C1</th>
<th>C2</th>
<th>D1</th>
<th>D2</th>
<th>E1</th>
<th>E2</th>
<th>F1</th>
<th>F2</th>
<th>G1</th>
<th>G2</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Ficus bengalensis</td>
<td>阿里桑榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>31</td>
<td>Ficus biflora</td>
<td>水菠萝</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>32</td>
<td>Ficus lyrata</td>
<td>大琴葉榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>33</td>
<td>Ficus religiosa</td>
<td>蒲團榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>34</td>
<td>Ficus subpunctata</td>
<td>華蓋榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>35</td>
<td>Ficus vartega</td>
<td>青果榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>36</td>
<td>Ficus vienes</td>
<td>大葉榕, 黃葉榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>37</td>
<td>Garrinia subphylla</td>
<td>華蓋隔木</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>38</td>
<td>Hyophorbe lagenicarpa</td>
<td>酒瓶欒子</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>39</td>
<td>Anacalza var. microcarpa</td>
<td>小葉藏冬青</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>40</td>
<td>Jurinea chinensis 'Yazukura'</td>
<td>紫陽花</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>41</td>
<td>Khaya senegalensis</td>
<td>木波隴</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>42</td>
<td>Koelreuteria elegans subsp. formosana</td>
<td>台灣巢桐</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>43</td>
<td>Liquidamber formosana</td>
<td>桂香</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>44</td>
<td>Lysiloma glutinose</td>
<td>濃樅榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>45</td>
<td>Lysiloma monopetala</td>
<td>假林木槿子, 假林樹</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>46</td>
<td>Mecilia breviflora</td>
<td>三文頜榕, 剃花榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>47</td>
<td>Mecilia ohariangensis</td>
<td>三重晨曦</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>48</td>
<td>Mecilia chinensis</td>
<td>華蓋榕, 香港殼榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>49</td>
<td>Mecilia velutina</td>
<td>威武樹</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>50</td>
<td>Melia azedarach</td>
<td>梅, 柚梅</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>51</td>
<td>Melia champaca</td>
<td>質藤榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>52</td>
<td>Monnecia nervosa</td>
<td>牛連榕</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>53</td>
<td>Myrtus nagi</td>
<td>香楠</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>54</td>
<td>Palaquium formosanum</td>
<td>公園種木</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>55</td>
<td>Pettenocarpus tonkinensis</td>
<td>綠珍珠</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>56</td>
<td>Phoenix dactylifera</td>
<td>椰葉, 華桐樹</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>57</td>
<td>Pterosarya rubra</td>
<td>藤葛花, 紅藤葛花</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>58</td>
<td>Podocarpus macrophyllus</td>
<td>墩墩松</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>59</td>
<td>Polyscias longifolia</td>
<td>壹葉斑藤</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
### Appendix D - Suitable Tree Species for each Street Typology

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Suitable Street Type</th>
<th>Street Sub-type</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>Polyspora awatiflora</td>
<td>大頭茶</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Pinanga pinnata</td>
<td>水黃皮</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Pterocarpus indicus</td>
<td>紅棗</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Pterocarpus heterophyllus</td>
<td>鳥足茶</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Raddeantheca hassleriana</td>
<td>海南黃豆樹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Rhus hypoleuca</td>
<td>白樹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Sapindus saman</td>
<td>槭樹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Sapium sebae</td>
<td>山聶柏</td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Sapium sebiferum</td>
<td>重陽木</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Schima superba</td>
<td>柿樹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Senna spectabilis</td>
<td>紅豆杉</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Strychnos mahagoni</td>
<td>桃花心木</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Syzygium jambos</td>
<td>藤桃, 鋍桃</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Syzygium samarangense</td>
<td>紅花楹, 楠木</td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Thepsea populnea</td>
<td>水冬瓜, 春穗</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Ulmus parvifolia</td>
<td>老梅</td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Wodyetia bifurcata</td>
<td>金剛樹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>Karrokovskienon chrysanthus</td>
<td>金線</td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Zanthoxylum japonica</td>
<td>大葉香楓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix E. Recommended List of Complementary Vegetation Community Mix
<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Chinese name</th>
<th>Origin</th>
<th>Evergreen</th>
<th>Semi-deciduous</th>
<th>Deciduous</th>
<th>Woody</th>
<th>Herbaceous</th>
<th>Annual</th>
<th>Perennial</th>
<th>Fast</th>
<th>Medium</th>
<th>Slow</th>
<th>Normal Height /Length</th>
<th>Growth rate</th>
<th>Normal Spread</th>
<th>Ecological value</th>
<th>Ornamental Value</th>
<th>Tolerance - environmental factor</th>
<th>Feasible for current nursery procurement</th>
<th>Feasible for long-term propagation potential</th>
<th>Poisonous species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus cochinchinensis</td>
<td>天門冬</td>
<td>Native</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>&lt;0.3m</td>
<td>Slow</td>
<td>&lt;0.3-0.6m</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Asparagus densiflorus 'Sprengeri'</td>
<td>非洲天門冬</td>
<td>Exotic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>&lt;0.3m</td>
<td>Slow</td>
<td>&lt;0.3-0.6m</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Lantana montevidensis</td>
<td>小葉馬纓丹</td>
<td>Exotic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>&lt;0.1-0.3m</td>
<td>Slow</td>
<td>&lt;0.1-0.3m</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Melastoma dodecandrum</td>
<td>地菍</td>
<td>Native</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>&lt;0.1m</td>
<td>Slow</td>
<td>&lt;0.1m</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
# Appendix E - Recommended List of Complementary Vegetation Community Mix

<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Chinese name</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alocasia macrorrhiza</td>
<td>海芋</td>
<td>Native</td>
</tr>
<tr>
<td>Amaranthus spinosus</td>
<td>刺莧</td>
<td>Exotic</td>
</tr>
<tr>
<td>Amaranthus tricolor</td>
<td>菖蒲</td>
<td>Exotic</td>
</tr>
<tr>
<td>Amaranthus viridis</td>
<td>綠莧</td>
<td>Native</td>
</tr>
<tr>
<td>Asclepias curassavica</td>
<td>遠生柱子花</td>
<td>Exotic</td>
</tr>
<tr>
<td>Asimonopus affinis</td>
<td>養地繩草</td>
<td>Exotic</td>
</tr>
<tr>
<td>Crotalaria pallida var. obovata</td>
<td>猪屎豆</td>
<td>Exotic</td>
</tr>
<tr>
<td>Cydonia dactylon</td>
<td>狐牙根</td>
<td>Native</td>
</tr>
<tr>
<td>Desmodium triflorum</td>
<td>三點金</td>
<td>Native</td>
</tr>
<tr>
<td>Eremochloa ciliaris</td>
<td>蜈蚣草</td>
<td>Native</td>
</tr>
<tr>
<td>Eremochloa ophiuroides</td>
<td>假儉草</td>
<td>Native</td>
</tr>
<tr>
<td>Hedychium coronarium</td>
<td>蜀葵</td>
<td>Exotic</td>
</tr>
<tr>
<td>Nephrolepis auriculata</td>
<td>蒟蒻</td>
<td>Native</td>
</tr>
<tr>
<td>Ophiopogon japonicus</td>
<td>麥冬</td>
<td>Native</td>
</tr>
<tr>
<td>Oxisalis corniculata</td>
<td>順蔓草</td>
<td>Native</td>
</tr>
<tr>
<td>Panicum maximum</td>
<td>大茅</td>
<td>Exotic</td>
</tr>
<tr>
<td>Polygonoium chinense</td>
<td>大花母</td>
<td>Native</td>
</tr>
<tr>
<td>Rorippa indica</td>
<td>蕁菜</td>
<td>Native</td>
</tr>
<tr>
<td>Ruellia coeruleae</td>
<td>藥花菜</td>
<td>Exotic</td>
</tr>
<tr>
<td>Sesbania javanica</td>
<td>種花出菁</td>
<td>Native</td>
</tr>
<tr>
<td>Solanum americanum</td>
<td>少花茄</td>
<td>Exotic</td>
</tr>
<tr>
<td>Torenaya hassleriana</td>
<td>鷹翅花</td>
<td>Exotic</td>
</tr>
<tr>
<td>Tropaeolum majus</td>
<td>旱金蓮</td>
<td>Native</td>
</tr>
<tr>
<td>Zingiber officinale</td>
<td>香薑</td>
<td>Exotic</td>
</tr>
<tr>
<td>Zornia gibbosa</td>
<td>丁癸草</td>
<td>Native</td>
</tr>
</tbody>
</table>

## Herbaceous Species

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Growth rate</th>
<th>Normal Height</th>
<th>Normal Spread</th>
<th>Ecological value</th>
<th>Ornamental Value</th>
<th>Tolerance - environmental factor</th>
<th>Tolerance - soil condition</th>
<th>Feasible for current nursery procurement</th>
<th>Feasible for long-term propagation potential</th>
<th>Poisonous species</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flower nectar for insects</td>
<td>Larval foodplants for insects</td>
<td>Fruits for wildlife</td>
<td>Seeds for wildlife</td>
<td>Flower</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientific name</td>
<td>Chinese name</td>
<td>Origin</td>
<td>Characteristic</td>
<td>Growth Rate</td>
<td>Form</td>
<td>Normal Height</td>
<td>Normal Spread</td>
<td>Ecological Value</td>
<td>Ornamental Value</td>
<td>Tolerance - Environmental Factor</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------</td>
<td>--------</td>
<td>----------------</td>
<td>-------------</td>
<td>------</td>
<td>---------------</td>
<td>---------------</td>
<td>----------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td><strong>Appendix E - Recommended List of Complementary Vegetation Community Mix</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shrub Species</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arbutus heteropetala</td>
<td>鹹爪花</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbarea cristata</td>
<td>紫金花</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boehmeria diffusa</td>
<td>紫金花</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boehmeria nivea</td>
<td>冬青</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buxus sinensis</td>
<td>九節</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calliandra huxleyana</td>
<td>黑面神</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caprsi cuniculus</td>
<td>紫陽花</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clerodendrum ceylanicum</td>
<td>大戟</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demidovia heterophylla</td>
<td>槭木</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demidovia reticulatum</td>
<td>槭木</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deroceras chinensis</td>
<td>僧帽花</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donmii erios</td>
<td>楊梅</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focaccia hirta</td>
<td>棕葉梅</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuchsia macroptha</td>
<td>大葉千斤拔</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuchsia himalayana</td>
<td>山茶</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gardenia jasminoides</td>
<td>木蓮</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hibiscus rosa-sinensis</td>
<td>朱槿</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ixora chinensis</td>
<td>紫杜鵑花</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lantana camara</td>
<td>紫薇</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leucojum vernum</td>
<td>鹹蛋花</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ligustrum sinense</td>
<td>山茶</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Litsea rotundifolia var. oblongifolia</td>
<td>老君柴</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malvaviscus penduliflorus</td>
<td>蠕形花</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melastoma malabathricum</td>
<td>木南</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melastoma suessaginum</td>
<td>木南</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michelia figo</td>
<td>大臙肢</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millettia nuda</td>
<td>亮葉崖豆藤</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mocanunda pubescens</td>
<td>毛菍</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phoneium chloendr</td>
<td>虚葉藤</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyporus assiliensis</td>
<td>木蘭</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychotria asiatica</td>
<td>假地豆</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhaphiolepis indica</td>
<td>草繡球</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhododendron mucronatum</td>
<td>紅杜鵑</td>
<td>Exotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhododendron pulchrum</td>
<td>梅葉冬青</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhododendron phoeniceum</td>
<td>鳳頭茶</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhododendron obtusum</td>
<td>杜鵑</td>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Shrub Species

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Chinese name</th>
<th>Origin</th>
<th>Form</th>
<th>Natural Height</th>
<th>Normal Spread</th>
<th>Ecological Value</th>
<th>Ornamental Value</th>
<th>Tolerance - environmental factor</th>
<th>Tolerance - soil condition</th>
<th>Feasible for current nursery procurement</th>
<th>Feasible for long-term propagation potential</th>
<th>Poisonous species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodomyrtus tomentosa</td>
<td>桃金娘</td>
<td>Native</td>
<td>Oval</td>
<td>≥0.5m</td>
<td>≥1m</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>Ricinus communis</td>
<td>蓖麻</td>
<td>Exotic</td>
<td>Oval</td>
<td>≥0.5m</td>
<td>≥1m</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>Sarcandra glabra</td>
<td>草珊瑚</td>
<td>Native</td>
<td>Oval</td>
<td>≥0.5m</td>
<td>≥1m</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>Scaevola taccada</td>
<td>草海桐</td>
<td>Native</td>
<td>Oval</td>
<td>≥0.5m</td>
<td>≥1m</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>Urena lobata</td>
<td>肖梵天花</td>
<td>Native</td>
<td>Oval</td>
<td>≥0.5m</td>
<td>≥1m</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>Uvaria macrophylla</td>
<td>紫玉盤</td>
<td>Native</td>
<td>Oval</td>
<td>≥0.5m</td>
<td>≥1m</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
<td>¥</td>
</tr>
</tbody>
</table>