

9. Complementary Vegetation Community Mix

9.1 Layers of Vegetation

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 (CVCN).

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”.⁶¹ 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 CVCN should be able to simulate natural habitats for the target animal community where appropriate.

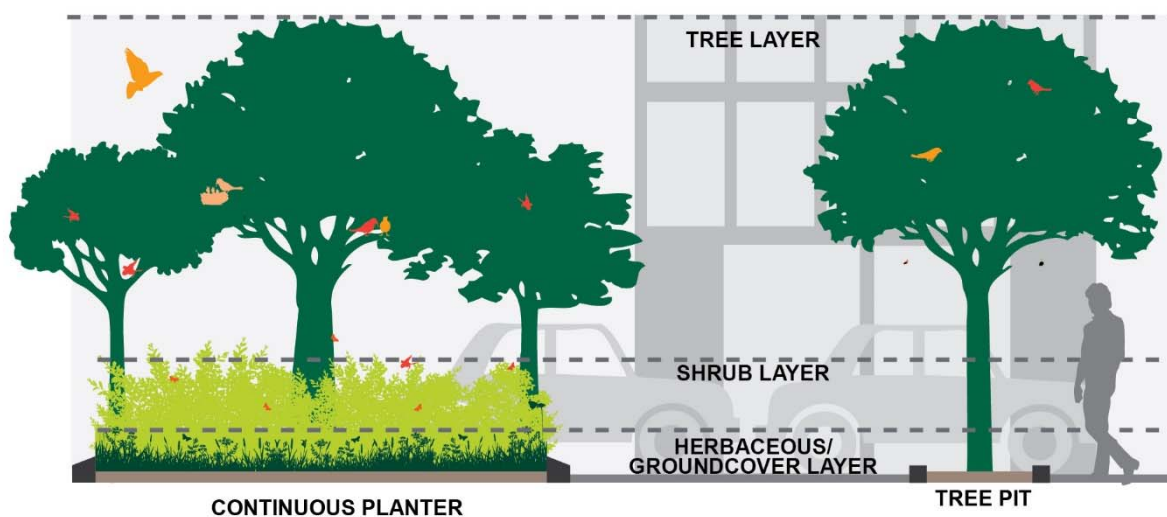


Figure 9-1 – The Three Layers of Vegetation

⁶¹ Department of Conservation and Natural Resources, Pennsylvania Government. (2018). *Plant Communities*. Retrieved from www.dcnr.pa.gov/Conservation/WildPlants/PlantCommunities/Pages/default.aspx.

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^{62 63}. 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.

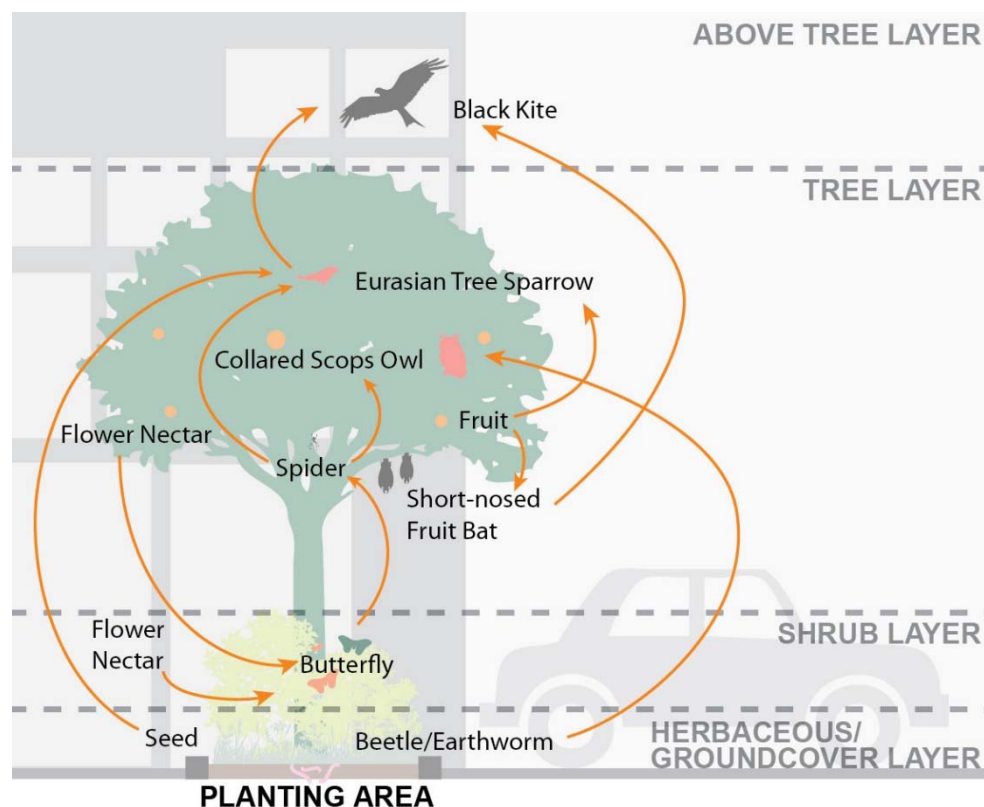


Figure 9-2 – Examples of Hong Kong Urban Wildlife Food Web in Different Vegetation Layers

⁶² Williams, K. (2014). A Dozen "Must Have" Plants for Backyard Habitat. *New Jersey Audubon*. Retrieved from www.njaudubon.org/SectionBackyardHabitat/ADozenMustHavePlantsforBackyardHabitat.aspx

⁶³ Huang, Q., Swatantran, A., Dubayah, R., & Goetz, S. J. (2014). The influence of vegetation height heterogeneity on forest and woodland bird species richness across the United States. *PLoS One*, 9(8), e103236.

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.

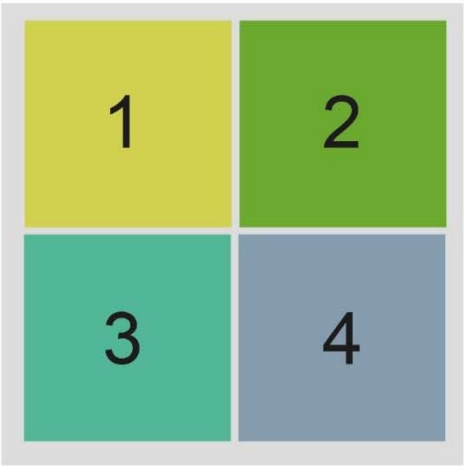
9.4 Selection Principles and Considerations

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.

Example of 100 Plants Module

Family



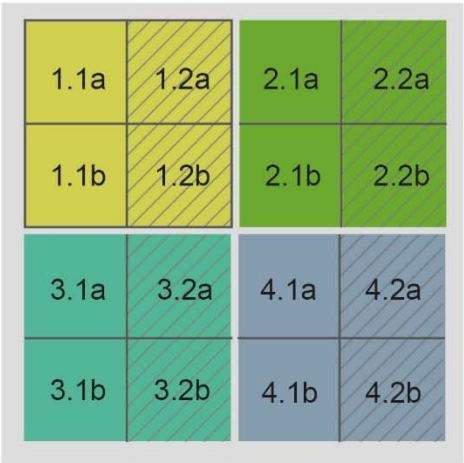
4 Family (25%)
<30% each

Genus



8 Genus (12.5%)
<20% each

Species



16 Species (6.25%)
<10% each

Each Family
= no more than 30%

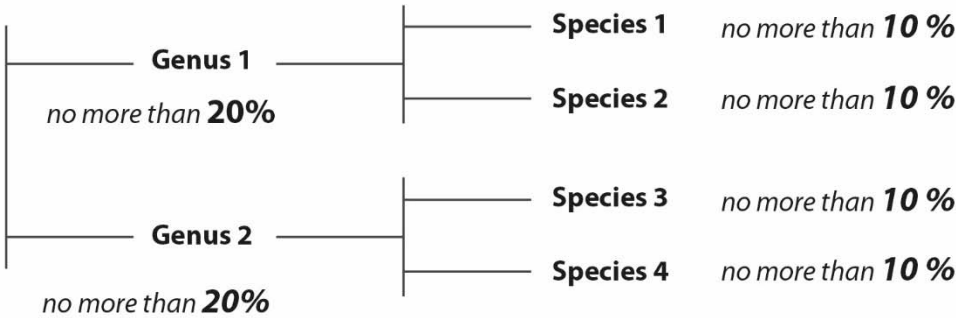


Figure 9.3 10-20-30 Rule for Planting Diversity

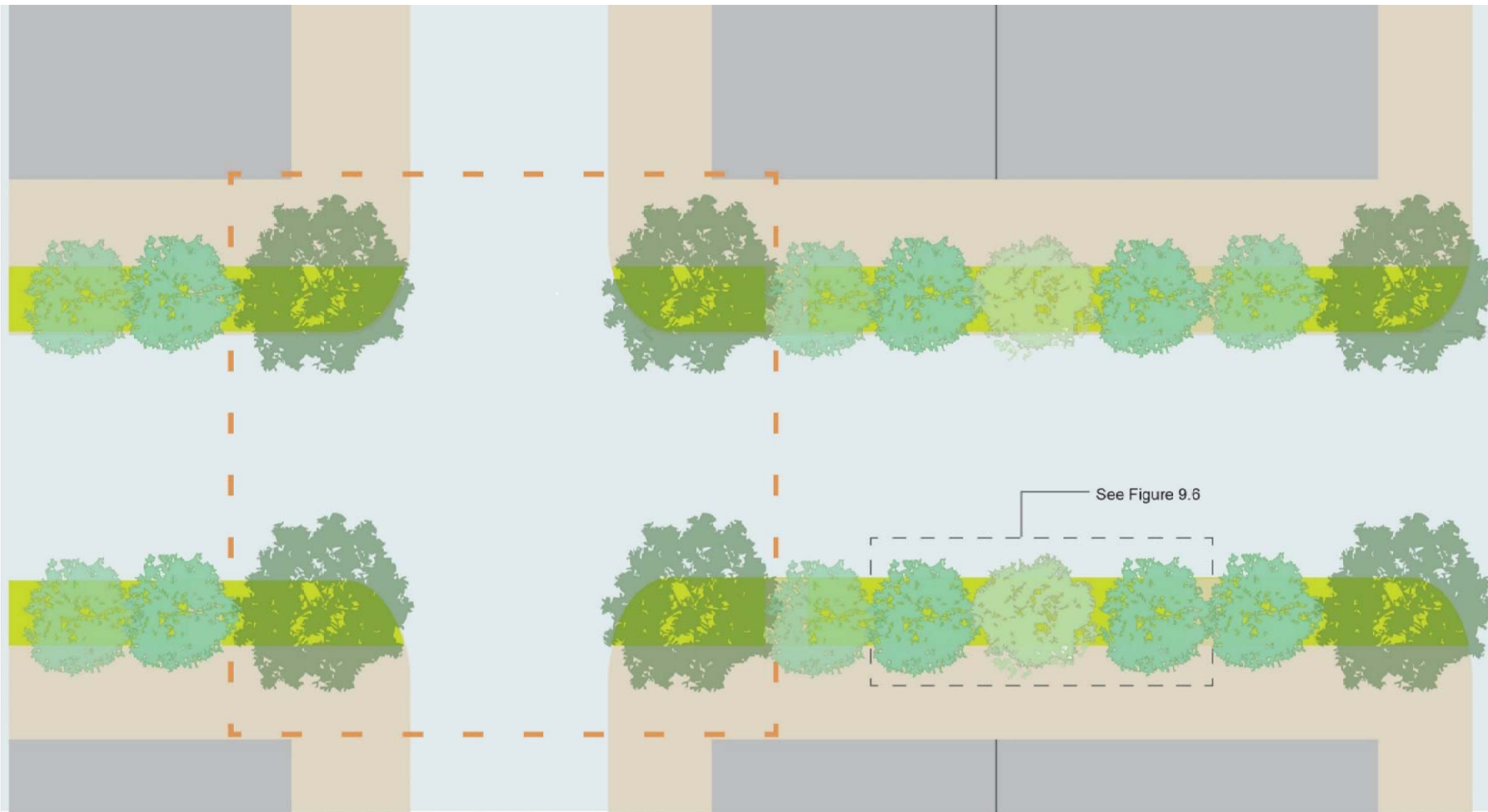


Figure 9.4 Examples to Showcase Planting Rhythm and Diversity (Plan)



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



B C 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

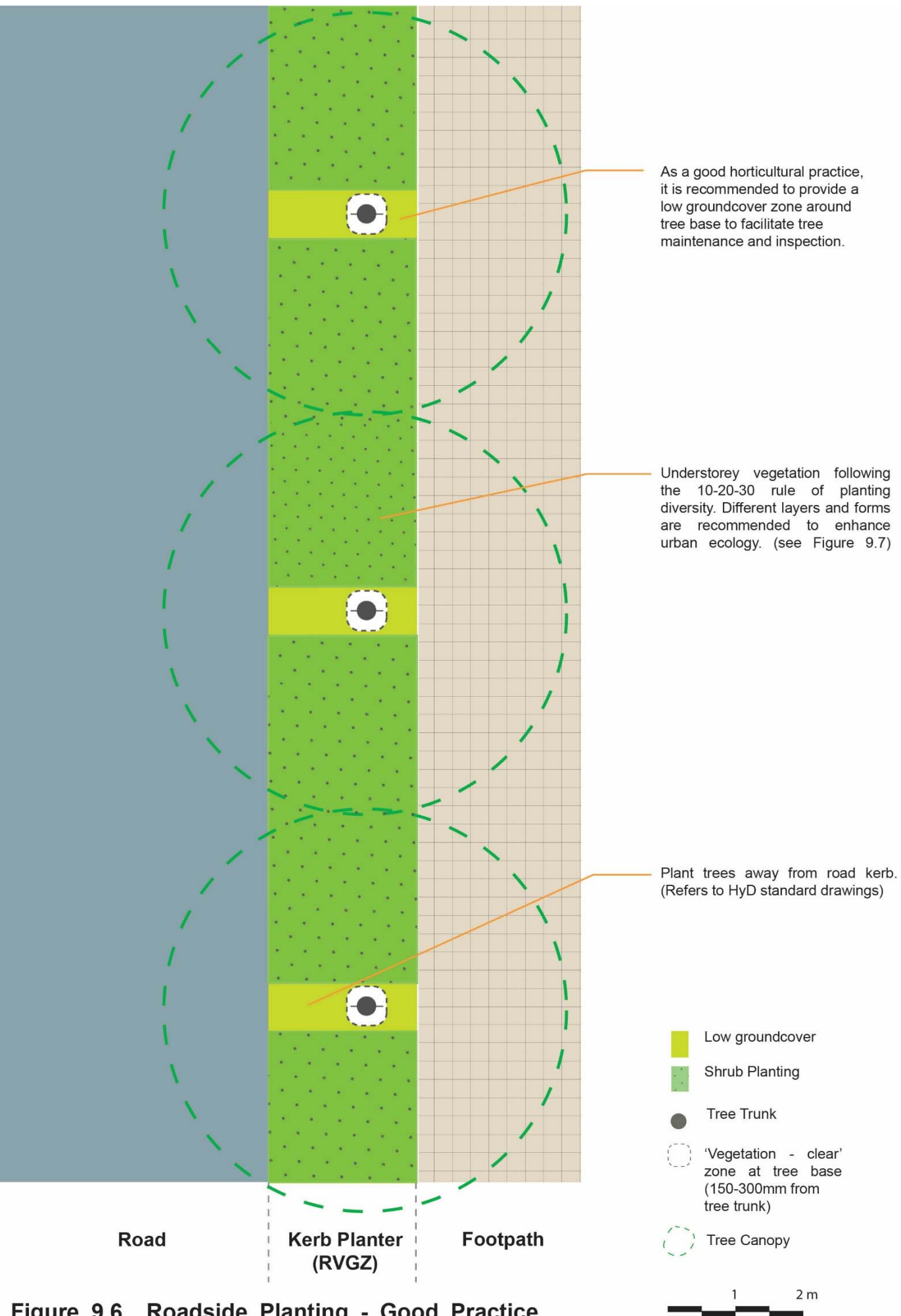
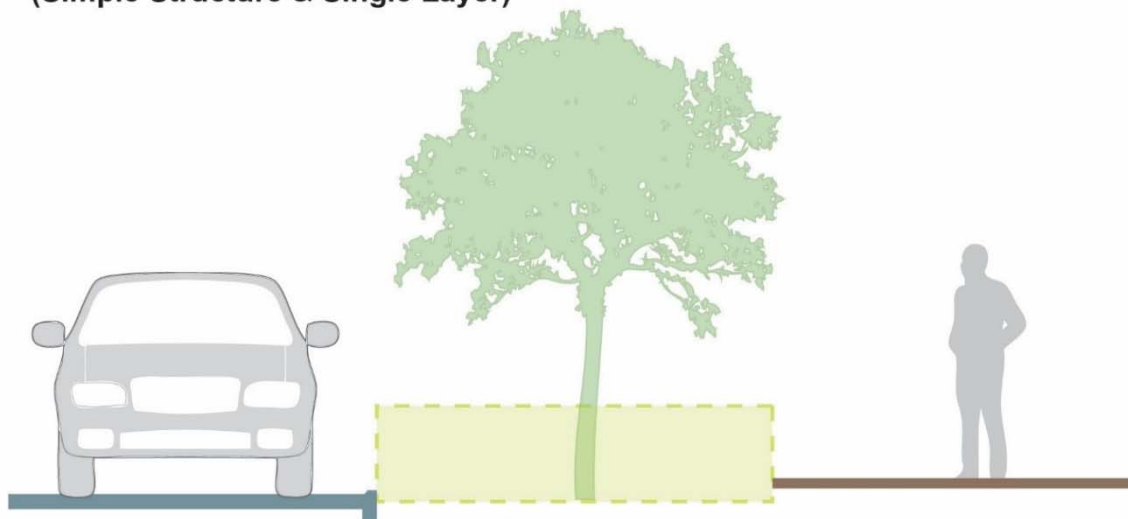


Figure 9.6 Roadside Planting - Good Practice



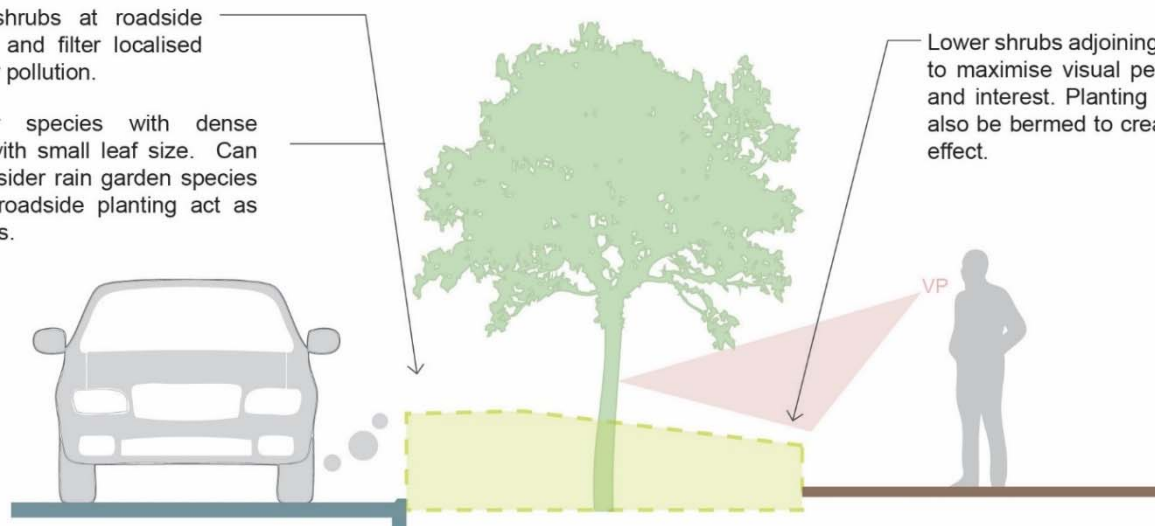
Not recommended
(Simple Structure & Single Layer)



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.

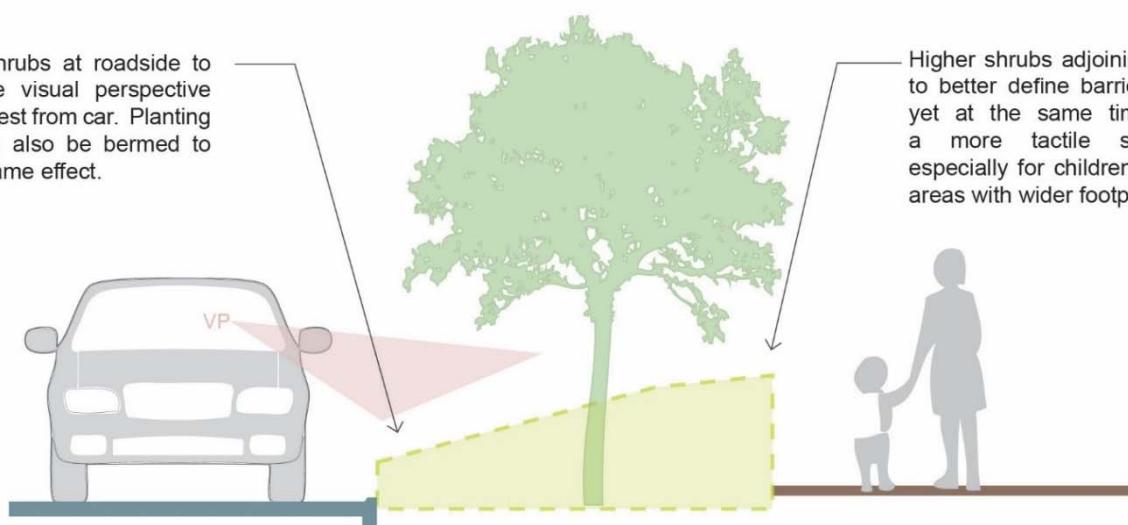


Lower shrubs adjoining footpath to maximise visual perspective and interest. Planting strip can also be bermed to create same effect.



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.

0.5 1m

Figure 9-7 – Different Layers and Forms of Understorey Vegetation



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.

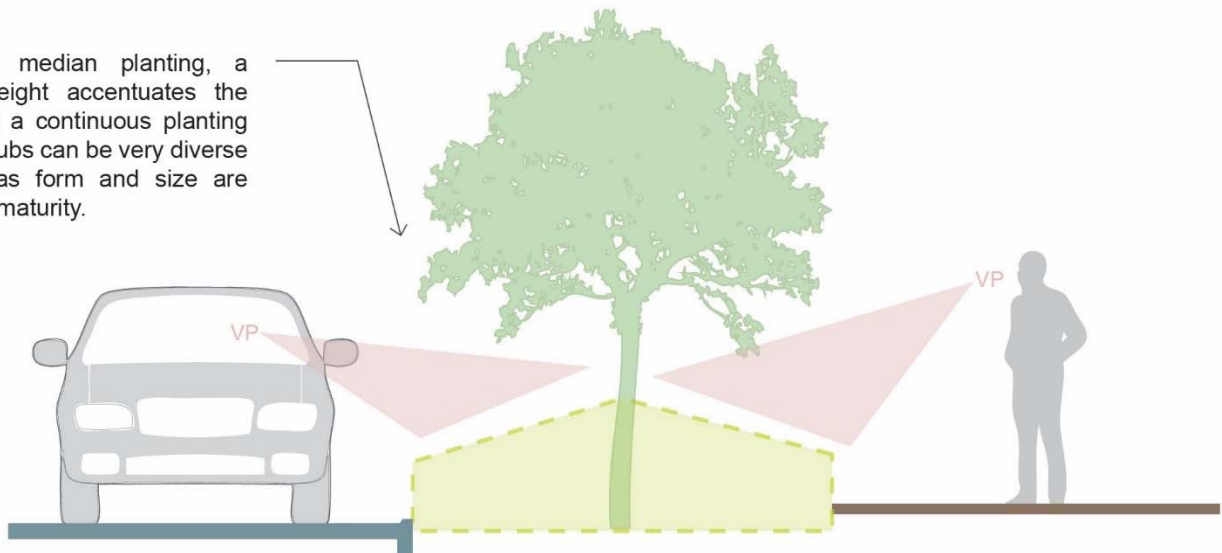


Figure 9-7 – Different Layers and Forms of Understorey Vegetation (continued)