承思·續後

SUCCEED • SUSTAIN SLOPESCAPE

"vegetation regeneration for our community"

斜坡植林優化計劃

ENHANCEMENT PROGRAMME OF VEGETATED SLOPES

路政署

Highways Department

Contents

Foreword

This booklet introduces the background, objectives and content of the Highway Department's SUCCEED • SUSTAIN SLOPESCAPE: Enhancement Programme of Vegetated Slopes (The Programme).

In view of safeguarding the public, the Highways Department has initiated the Programme to replace senescent trees and trees with structural or health problems. After the trees are removed, native species will be planted in the original sites to enrich the local ecology, enhance biodiversity, and create a sustainable and lively environment.

Hong Kong Slope Overview

The Formation of Man-made Slopes

Due to Hong Kong's rapid development in the 1950s and 60s, infrastructure and road networks were massively built. As a result, a large number of man-made slopes were created.

Government-managed Slopes

Roadside Slope

Expressway Slope

Hong Kong Slope Overview

Number of Slopes in Hong Kong

There are currently approximately 60,000 man-made slopes in Hong Kong. 40,000 of them are managed by the government.

Among those, the Highways Department is responsible for the management and maintenance of approximately 10,000 slopes.

Source: "Government Slope Safety Works 2017", CEDD

Hong Kong Slope Overview

Common Species in Early Vegetation

The government started the plantation of *Acacia confusa* and other pioneer species on slopes and roadside as vegetation cover in the 1950-60s.

These pioneer trees can quickly establish vegetation cover, prevent soil erosion, stabilise slope and prevent landslide.

Three common types of pioneer tree species:

台灣相思

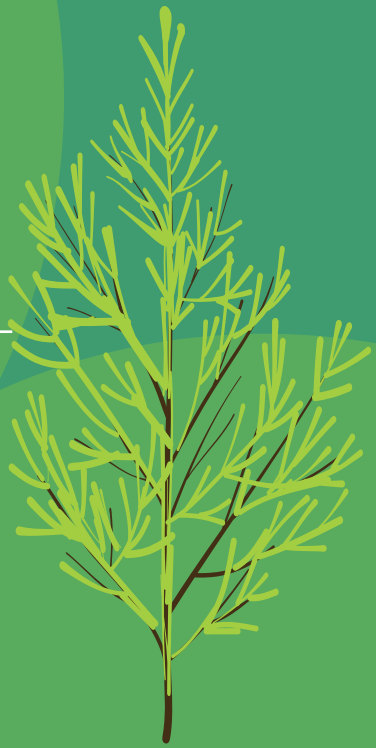
Acacia confusa

紅膠木

Lophostemon confertus

濕地松

Pinus elliottii



Hong Kong Slope Overview

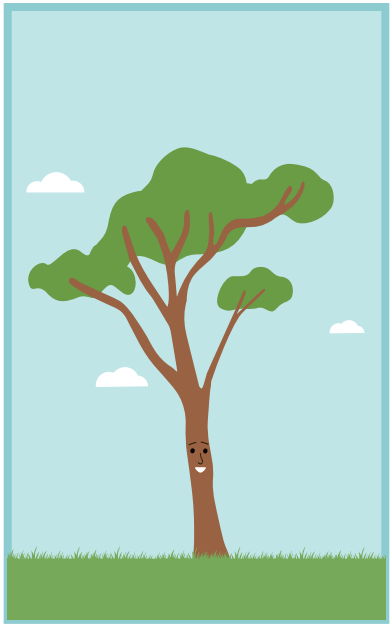
Common Species in Early Vegetation

A Profile of *Acacia*

Lifespan: 50 - 60 years

Responsibilities: slope reinforcement by its roots, prevention of soil erosion and establishment of vegetation cover

Pros	Cons
● Fast growing ● Can establish rapidly on thin and poor soil	● Ecologically monotonous ● Hindering the growth and natural propagation of other native species ● Unattractive to birds and insects and suppressing the growth of other species around ● Short lifespan, replacement upon senescence required ● Structurally leaning in nature



Hong Kong Slope Overview

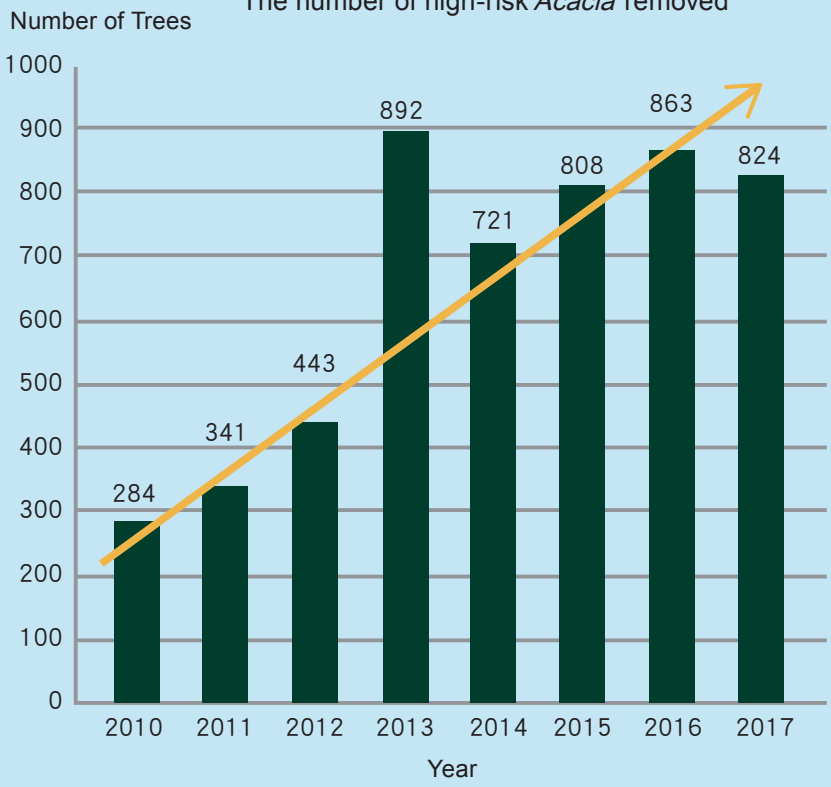
Tree Safety on Slopes

Due to ageing and various environmental factors, the trees on man-made slopes are becoming senescent or deteriorating in health or structural stability, posing significant threat to the public.

Such occurrences will result in obstruction of traffic, and even casualties and property damage.

According to the maintenance record from Highways Department, the number of high-risk *Acacia* removed has been increasing continuously.

The number of high-risk *Acacia* removed



Source: Highways Department

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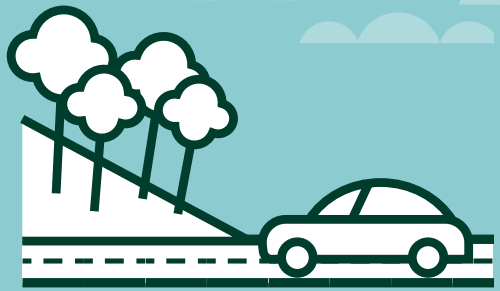
ENHANCEMENT PROGRAMME OF VEGETATED SLOPES

Programme Objectives

With the aging and deteriorating of mass numbers of *Acacia* trees on slopes, the Highways Department launched the SUCCEED • SUSTAIN SLOPESCAPE：Enhancement Programme for Vegetated Slopes in 2016 as a proactive measure, with three main objectives:



Public Safety

- Better safeguard public safety by reducing risk of tree failure on roadside slopes

Sustainable Development

- Promoting the long-term sustainability of tree management
- Enhancing urban ecology by replanting diverse and native plant species

Enhance Biodiversity

- Multi-layer cultivation of native species to increase biodiversity
- Multi-layered tree crowns attract more insects and birds to form a more mature ecological system
- Improving roadside landscape and its ecological value
- Reducing pest outbreaks

Staff from the Landscape Division from the Highways Department assess and prioritise the replacement work and design vegetation for the slopes which are of higher aesthetic and ecological value.

Stages

Problem:
The trees on slopes, including *Acacia*, become senescent, posing safety risk on road users

1 Planning

Field studies
Consultation
Public education

2 Prioritisation

Assessment

Public education

- Scoring assessment
- Risk of collapse
- Tree size
- Slope location/condition

3 Implementation

- Remove potentially dangerous trees on slopes
- Replant native and localised species catered to the local conditions

4 Yard Waste Management

4R
- Refuse
- Reduce
- Reuse
- Recycling

5 Monitoring and Evaluation

- Monitoring
- Consultation
- Experience sharing
- Case studies

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ENHANCEMENT PROGRAMME OF VEGETATED SLOPES

1

Planning :

Conduct field studies, draft preliminary plan, consult relevant stakeholders and experts such as tree experts and the District Council, and promote through public education

2

Prioritisation :

Systematic surveys with scoring system will be carried out to assess the current tree health, structure and habitat conditions in order to set out the work priority

3

Implementation :

Remove potential dangerous trees on slopes and replant native and localised species catered to the local conditions

4

Yard Waste Management :

In alignment with the 4R principle to avoid vegetation replacement (Refuse), reduce tree crown removal (Reduce), reuse wood (Reuse), and upgrade and recycle (Recycle)

5

Monitoring and Evaluation :

Monitor the progress, review feedback, evaluate the effectiveness and adjust the approach based on continuous evaluation

Three-step Replacement

Concept

The Highways Department progressively removes *Acacia* and the trees that pose potential danger on slopes.

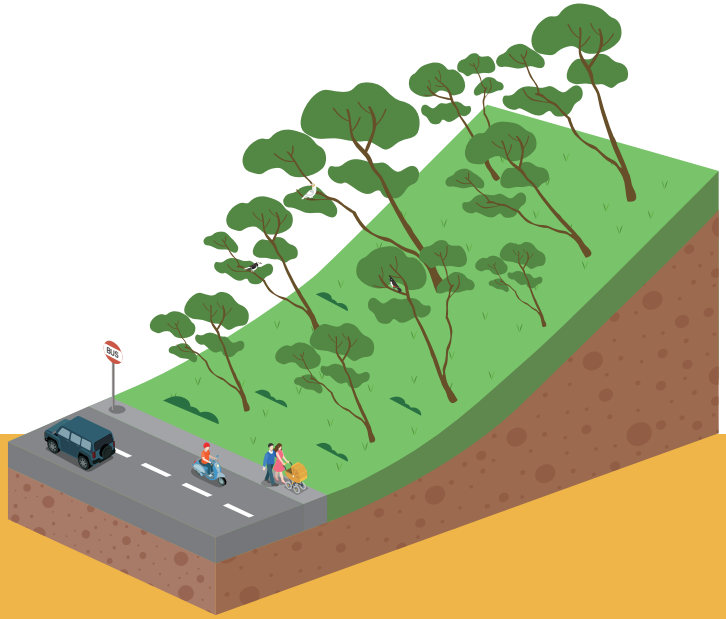
Planning

Removal of senescent trees

Replacement and replanting

Three-step Replacement

Planning



The root development of these Acacia trees is restricted by the environment of man-made slopes. The dense growing condition of the trees results in leaning structure and increases risk of tree collapse. Therefore, a systematic replacement programme is required.

Three-step Replacement

Removal of Senescent Trees

How are trees on slopes assessed for replacement ?

Tree removal works are prioritised through assessing the five aspects:

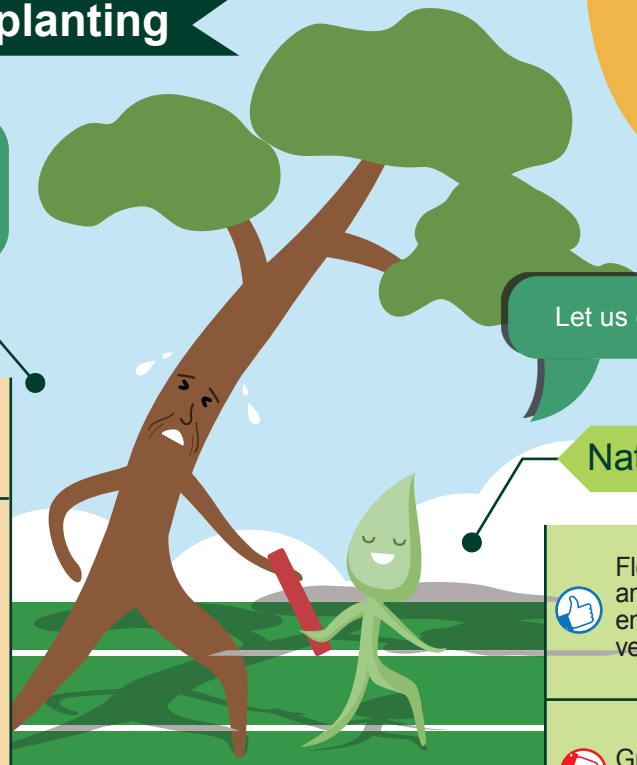
Tree size :	large size / large amount of *Acacia* among tree groups
Failure potential:	Number of *Acacia* trees assessed with poor health / structural condition
Target rating:	Potential risk on the road conditions
Site conditions:	Topography – Slope gradient / slope height
Site sensitivity :	History of tree failure

Three-step Replacement

Replacement and Replanting

Upon the completion of mission by *Acacia* trees, native species take over the responsibility of greening roadside slopes. They will SUCCEED and SUSTAIN.

We have fulfilled our duty of greening and stabilising the slopes. It is now time to retire.



Let us carry on the torch

Acacia confusa

- Fast growing
- Can establish rapidly on thin and poor soil

- Ecologically monotonous
- Hindering the growth and natural propagation of other native species
- Unattractive to birds and insects and suppressing the growth of other species around
- Short lifespan, replacement upon senescence required
- Leaning on slopes

Native plant species

- Flowers and fruits attract birds and insects, and help to enrich biodiversity on slope vegetation

- Growth rate of some native species is relatively slow

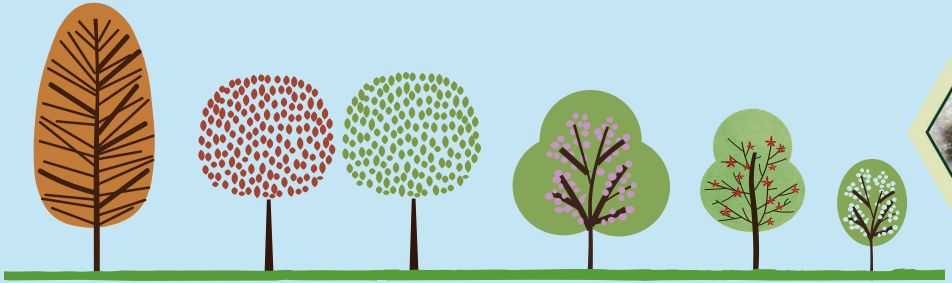
Three-step Replacement

Common Native Species

Native species are replanted on slopes, with reference to relevant guidelines.

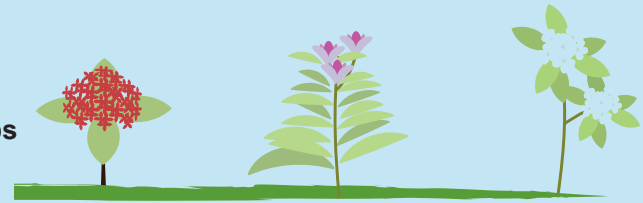
The principle of the "Right Trees at the Right Place" is adopted during the design of replacement planting, which is aimed to provide a safe and ecological vibrant road environment for the public.

Trees



楓香
Liquidambar formosana

Shrubs



山指甲
Ligustrum sinense

假蓮翹
Duranta repens

Three-step Replacement

Sustainable Plantation

Multi-layered planting can create different heights, forms and colours in different tree clusters, creating a diverse roadside scenery.

The new plantations can sustain and replenish themselves naturally, preventing the need for future replacement.

Pilot Scheme

Yuen Chau Kok, Sha Tin

Slope Vegetation

An extensive number of *Acacia* trees had been planted on the roadside slope at Yuen Chau Kok, Sha Tin, posing a safety risk for vehicle drivers and those on the cycling track.

After removing these *Acacia* trees, the Highways Department replanted various tree species like *Viburnum odoratissimum* and *Sterculia lanceolata*, and shrubs like *Lantana montevidensis* and *Duranta erecta*, to increase biodiversity and plant species.

Before replacement

After replacement

Duranta erecta

Rhodomyrtus tomentosa

Viburnum odoratissimum

Sterculia lanceolate

Pilot Scheme

Pui Man Street, Wong Tai Sin

Trees including *Celtis sinensis* and *Bauhina*, and shrubs such as *Raphiolepis indica*, *Rhododenddron simsii*, *Ixora chinensis* and *Hibiscus rosasinensis* were replanted after the removal of the *Acacia* trees. They can enrich biodiversity and provide visual interest.

Before replacement

After replacement

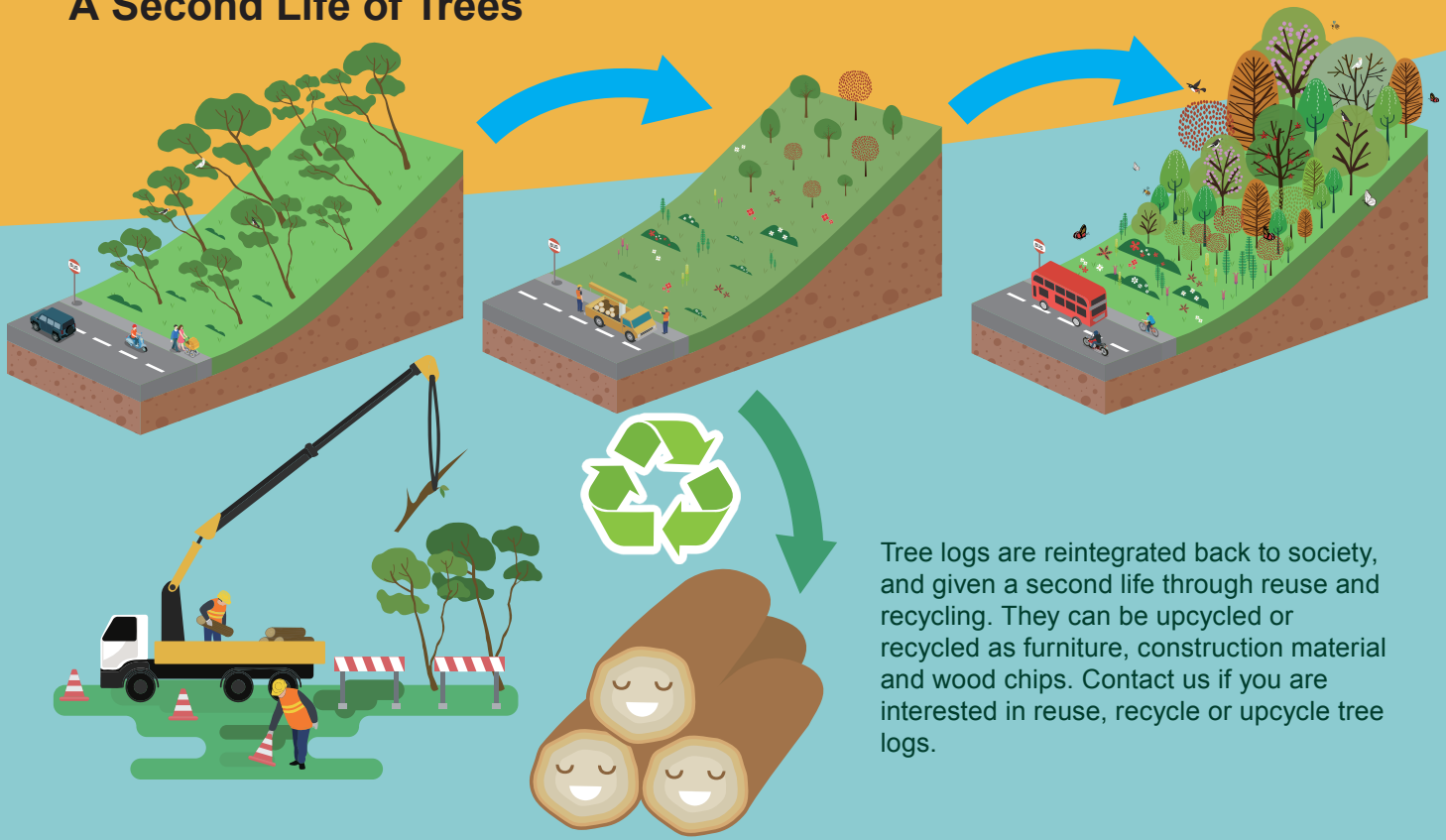
Liquidambar formosana

Ixora chinensis

Rhapniolepis indica

Reuse and Upcycling

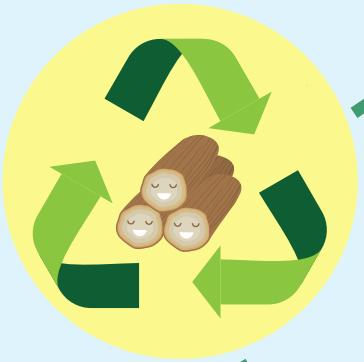
A Second Life of Trees



Tree logs are reintegrated back to society, and given a second life through reuse and recycling. They can be upcycled or recycled as furniture, construction material and wood chips. Contact us if you are interested in reuse, recycle or upcycle tree logs.

Reuse and Upcycling

Upcycled Products



Reusing as construction materials

Wood chips for agricultural use

Making furniture or art work

Way Forward

We will continue to review and monitor the outcome of the “SUCCEED•SUSTAIN SLOPESCAPE : Enhancement Programme for Vegetated Slopes”

Outcome

Keep an eye out for them the next time you pass by the Highways Department's slopes.

Pycnonotus jocosus

Udara dilecta

Abisara echerius

Papilio memnon

Tagiades menaka

Lonchura striata

Spilopelia chinensis

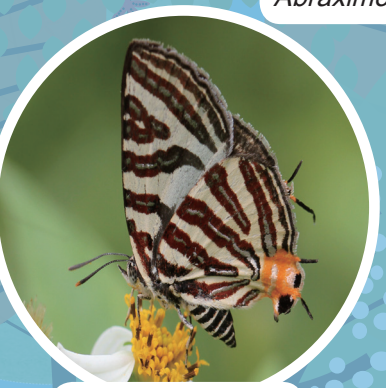
Cacatua goffiniana

Nacaduba kurava

Abraximorpha davidii

Neptis hylas

Delias pasithoe

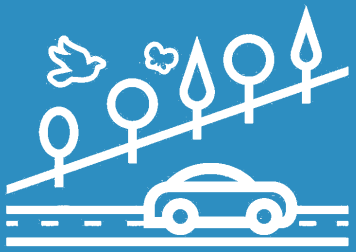


Spindasis lohita

Dercas verhuelli

Larvae of Chilasa clytia

Acytolepis puspa



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