City of
STONNINGTON

GARDINERS CREEK (KOOYONGKOOT)
MASTERPLAN

MCGREGOR
COXALL

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Contents

ACKNOWLEDGEMENT OF COUNTRY

GARDINERS CREEK (KOOYONGKOOT) IS CULTURALLY SIGNIFICANT TO THE TRADITIONAL CUSTODIANS OF THE AREA KNOWN AS THE BOON WURRUNG AND WURUNDJERI PEOPLES OF MELBOURNE & PORT PHILLIP. THE WURUNDJERI STILL USE THE AREA TODAY AND THEIR HISTORY AND CONNECTION TO THE LAND IS DEMONSTRATED BY THE ABUNDANCE OF SIGNIFICANT RESOURCE MATERIALS THAT HAVE BEEN COLLECTED FROM WITHIN AND ADJOINING THE AREA OVER THOUSANDS OF YEARS.

WE ALL HAVE A RESPONSIBILITY TO SAFEGUARD, CELEBRATE AND TAKE AN ACTIVE INVOLVEMENT IN THIS CULTURE AND ITS FUTURE.

WE CONSIDER THE SIGNIFICANCE OF THIS PLACE AND ITS FUTURE, AS WE STEP OUT INTO IT.

WARNING: Aboriginal and Torres Strait Islander readers are warned that this document may contain images of deceased persons.

STONNINGTON CITY COUNCIL RECONCILIATION STATEMENT

THE COUNCIL OF THE CITY OF STONNINGTON ACKNOWLEDGES THAT BOON WURRUNG AND WURUNDJERI PEOPLES ARE THE TRADITIONAL CUSTODIANS OF THIS LAND AND HAVE STRIVED TO RETAIN THEIR IDENTITY AND CULTURES THROUGH MORE THAN TWO HUNDRED YEARS OF DISPOSSESSION AND COLONISATION.

COUNCIL RECOGNISES AND ACCEPTS ITS RESPONSIBILITY TO LEARN FROM, AND PROMOTE THE INTRINSIC VALUE OF ABORIGINAL AND TORRES STRAIT ISLANDER CULTURES, HERITAGE AND CONTEMPORARY ASPIRATIONS TO THE WIDER COMMUNITY, UNDERSTANDING THAT THIS ENRICHES AUSTRALIA'S HERITAGE AND OUR COMMUNITY.

COUNCIL ACKNOWLEDGES THE RIGHT OF ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES TO LIVE ACCORDING TO THEIR OWN VALUES AND CUSTOMS IN OUR DIVERSE COMMUNITY, SUBJECT TO AUSTRALIAN LAW.

COUNCIL RESPECTS BOON WURRUNG AND WURUNDJERI PEOPLES' SPECIAL RELATIONSHIP TO THE LAND AND RECOGNISES ABORIGINAL AND TORRES STRAIT ISLANDER SACRED SITES AND SIGNIFICANT PLACES.

COUNCIL RECOGNISES THE VALUABLE CONTRIBUTIONS TO VICTORIA MADE BY ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES AND WILL WORK TOGETHER TOWARDS A FUTURE OF MUTUAL RESPECT AND HARMONY.

MASTERPLAN CONTEXT

1.0 Introduction

1.1. Project Background

WHY IS THIS MASTERPLAN HAPPENING?

As a city that is ever changing, under the pressures of climate change and increasing demand on open space from residents and visitors, the City of Stonnington is ensuring it continues to be attractive, vibrant and supportive to all members of the community well into the future.

Following the success of the Yarra River Biodiversity Project, the City of Stonnington is now seeking to improve the open space of its other major waterway, Gardiners Creek (KooyongKoot).

McGregor Coxall has been engaged alongside Wave Consulting, Australian Ecosystems and Zinc Cost Management by the City of Stonnington, to undertake a masterplan for Gardiners Creek corridor, which includes its parklands, trails, waterways and community precincts. The project brief states the project aim is to 'transform and enhance Gardiners Creek (KooyongKoot) and surrounding environs within the City of Stonnington through revegetation and biodiversity improvements, water sensitive urban design (WSUD) treatments, shared path upgrades and enhancing opportunities for passive and active recreation'.

This masterplan will be a key initiator in on-ground changes shaping the future of the corridor.

WHERE IS IT HAPPENING?

The Gardiners Creek (KooyongKoot) Masterplan focuses on Gardiners Creek (KooyongKoot) and its surrounding green corridor within the City of Stonnington, spanning the suburbs of Toorak, Kooyong, Malvern, Glen Iris and Malvern East. The site is an urban green corridor which functions as a multifaceted urban environment, providing the local community with large areas of active and passive open-space, varying ecologies and landscape characters, and important connections through the City of Stonnington and to adjacent suburbs.

WHAT IS A MASTERPLAN?

A masterplan is a strategic document that sets out the future planning, vision and development of a place. To create a holistic, cohesive plan, this masterplan incorporates information from background documents supporting the City of Stonnington, stakeholder information, community feedback, traditional owner engagement, local authorities and government authorities to set strategies and direct the future of the corridor.

WHY DO THIS PROJECT?

The City of Stonnington is committed to deliver on the aspirations and strategies of the Council its community. Documents such as the Sustainable Environment Strategy 2018-2023; Strategies for Open Space 2013; Urban Forest Strategy 2017 -2022; and,Stonnington Cycle Strategy 2013-2018, are directing the future development of infrastructure, community programs, urban ecologies and similar for the City of Stonnington. Currently, however, there is a gap in understanding how these plans could manifest and inform the future direction of Gardiners Creek corridor.

Gardiners Creek corridor is a highly utilised community asset that supports a large number of urban environments, infrastructure, water management, businesses and more. To successfully weave together the aspirations of the City of Stonnington, its community and all other requirements that rely on the creek, it is critical that a masterplan is formed that incorporates all the issues and opportunities into a clear, concise and aspirational document to guide its future.

GARDINERS CREEK CORRIDOR OVERVIEW

Access & Connectivity

Gardiners Creek corridor plays a key role in the movement and accessibility of the south-eastern suburbs of Melbourne. Its contextual placement before the Birrarung (Yarra River), gradual slope and synergistic character lend it to an active hub of life for many different requirements placed on it.

Within the Gardiners Creek corridor lies the Gardiners Creek Trail, a 17km stretch of shared user paths & bridges that connect the Yarra River Trail to Blackburn Road in Blackburn South. The Gardiners Creek Trail is a significant shared user path of state government priority. The trail provides a green corridor link for many locals for their daily commute, weekend run, dog walk and more, traversing many different councils, including the cities of Stonnington, Boroondara, Whitehorse and Monash.

Shared-use trails, such as the Gardiners Creek Trail, and other associated facilities need to provide safe, pleasant and connected journeys to encourage the use of active transport for both commuting and recreation.

Water - catchment, connections & health

The Gardiners Creek corridor begins approximately 10 km south-east of Melbourne CBD. Gardiners Creek (KooyongKoot) has very poor water quality, as do most urban drains and tributaries in the Melbourne region. The creek is a major tributary of the Birrarung (Yarra River) and therefore has a considerable impact on the quality and health of the Birrarung (Yarra River) and Port Phillip Bay.

The health of the waterway is crucial for not only supporting wildlife and ecosystems, but plays a key role in the social and economic wellbeing of the community.

Open space - Passive & Active Recreation

The Stonnington community highly value and utilise the Gardiners Creek corridor for passive and active recreation. This engagement with the corridor by the community is clear in the high use of sports ovals, facilities, car parks, cycling and walking trails, and more.

These public facilities are utilised round the clock and also provide welcome off-leash dog walking areas. Currently for sports clubs, these facilities are at full capacity and must be managed to provide a safe and organised open space that cohesively works along side other corridor users.

At only 20 sqm of public open space per community member within the City of Stonnington, it is clear that Gardiners Creek corridor provides one of the most significant, interconnected parklands within the council area. It has a vital role to play in ensuring community open space demands are met now and into the future.

Biodiversity

One of the most distinctive features of the Gardiners Creek corridor is the green reprieve it provides in a highly urbanised environment. Habitat lies in the fragmented islands of high faunal and floral species diversity, biodiversity hotspots, however the overall current ecological condition of Gardiners Creek (KooyongKoot) is moderately poor, with various sections ranging in condition from very poor to moderate. It is important that this corridor performs at a high level from an ecological point of view, contributing to a wider ecological network.

Cultural values

Gardiners Creek (KooyongKoot), as a living system, holds numerous stories and represents a history of thousands of years. Currently, however, there is a lack of interpretation, education and display of the natural and cultural values along the Gardiners Creek corridor.

Governance

Gardiners Creek (KooyongKoot) is a dynamic corridor that fulfils various functions. Its ownership and management is fragmented and complex due to the network of large critical city infrastructure that runs through and adjacent to the corridor. Spread across multiple council and management boundaries, the creek and corridor require a collaborative approach to management, funding and decision making with all stakeholders to achieve the best results for all parties.

GARDINERS CREEK CORRIDOR FUTURE

Building on Council's existing initiatives in the area, the Gardiners Creek (KooyongKoot) Masterplan presents a unique opportunity for the City of Stonnington to set a new benchmark for waterway health, biodiversity initiatives and active transport infrastructure while creating an important community outcome.

Figure 02. - Study area map

1.2. The Study Area

Gardiners Creek (KooyongKoot) is a multifaceted corridor, providing space to a large variety of requirements and users. This is a typical characteristic of a city creek corridor that has a strong connection to the local community as a provider of a variety of open space uses.

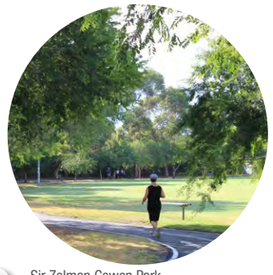
For the purposes of this masterplan, the study area has been identified from the mouth of the Birrarung (Yarra River) at St Kevin's College, Toorak, to Warrigal Road, Malvern East. Included within the study area is Sir Zelman Cowen Park (including Peter Birrell, Wadsworth, McAlpine, Righetti Oval and Peter Ferrie sports grounds), Tooronga Park, Gardiner Park, Glenburn Bend Park, TH King Oval, Glen Iris Wetlands, Glen Iris Park, East Malvern Tennis Club, Darling Park, and the Malvern Valley Golf Course. Areas outside of the scope of works will be considered for their impact on their connections into the Gardiners Creek corridor.

1 **Monash Freeway Elevated SUP**

Major transport artery for the greater Melbourne region. Elevated motorway over Gardiners Creek (KooyongKoot), utilised to hang the shared user path, connecting to Capital City Trail.

2 **Concrete Lined Gardiners Creek (KooyongKoot)**

Highly modified and urbanised creek, to facilitate water management for the catchment. Sections of the creek were lined with concrete to increase water capacity.



3 **Sir Zelman Cowen Park**

Home to numerous sporting clubs including football, soccer, and baseball. Large active open space.

4 **Tooronga Park**

Wedged between the Monash Freeway and the rail corridor, Tooronga Park offers and tranquil retreat for locals.

5 **Gardiners Creek Trail**

The Gardiners Creek Trail is a shared user path for both cyclists and pedestrians, which winds through the eastern suburbs following Gardiners Creek (KooyongKoot).

6 **Glenburn Bend Park**

Area rich with biodiversity, brought to life by members of the community.

7 **Glenburn Bend Tunnel**

Tunnel removing the need for stopping and crossing busy urban roads.

8 **T.H. King Oval**

Organised sports grounds, multi-use pavilion, playgrounds and picnic areas.

9 **Glen Iris Wetlands**

Highlighting the ecological, water quality and educational importance and role of public open space along the Gardiners Creek corridor.

10 **Darling Park**

Large active open space, featuring sports grounds, playgrounds, and bbq facilities.

11 **Gardiners Creek (KooyongKoot) Weir**

Water infrastructure dotted along Gardiners Creek (KooyongKoot) create stopping points and water engagement.

12 **Malvern Valley Golf Course**

18 hole golf course located on a Council reserve in an area subject to flooding.

1.3. Context

CITY OF STONNINGTON

MUNICIPAL PROFILE

The City of Stonnington is located in Melbourne's inner south-eastern suburbs, a short distance from the centre of Melbourne and alongside the Yarra River.

Covering an area of 25.62 square kilometres, the City stretches from Punt Road in the west to Warrigal Road in the east and is bounded by the Yarra River / Gardiners Creek (KooyongKoot) to the north and Dandenong Road to the south.

The City is primarily a residential area, with some commercial, industrial, office and institutional land uses. The Chapel Street Precinct is home to a vibrant entertainment area which attracts both residents and visitors to the municipality.

Stonnington is home to 16,807 businesses, contributing significantly to the city's vibrancy and prosperity. The industry sectors that contribute most significantly to Stonnington's growing economy are professional, scientific and technical services, health care and social assistance, and retail trade.

[Stonnington Municipal Profile 2019]

MUNICIPAL OPEN SPACE

The Gardiners Creek corridor within the City of Stonnington is an approximately 10km stretch of urban parklands connected by the Gardiners Creek (KooyongKoot) waterway, running from the mouth of the Birrarung (Yarra River) to the Malvern Valley Golf Course.

The creek forms the boundary line between the municipal areas of Stonnington and Boroondara with land to the south of the creek stewarded by Stonnington. The creek corridor is a significant open space network, containing; parks, reserves, and sports grounds for the City of Stonnington, with other parks and open spaces littered sporadically throughout the municipality. Major parks include Ardrie Park, Central Park, Como Park, Darling Park, Gardiner Park, Glenburn Bend Park, Glen Iris Park and wetlands, Grattan Gardens, Hedgeley Dene Reserve, Malvern Public Gardens, Orrong Romanis Park, Percy Treyvaud Memorial Park, Peverill Park, Phoenix Park, Princes Gardens, Rockley Gardens, Sir Robert Menzies Reserve, Sir Zelman Cowan Park, Toorak Park, Urban Forest Reserve, Victoria Gardens, Waverley Oval and Windsor Siding Reserve..

These open spaces provide recreation, exercise, events and activities, sports, urban ecology, connectivity and public amenities to the local community. However, at only 20 sqm of open space per community member within the City of Stonnington, it is clear that Gardiners Creek (KooyongKoot), as a significant open space corridor, needs to be catering to the needs of a broad cross section of the community.

GARDINERS CREEK TRAIL

Active transport, including walking, cycling and other non-motorised transport, is gradually becoming more popular in higher density inner suburbs of Australian cities (e.g. Zander et al 2014). Some of the important factors driving this increase in active transport include:

- Increasing congestion, encouraging people to use alternative transport modes;
- Increasing recognition of the roles of active transport in public health and environmental sustainability;
- Improving provision of active transport infrastructure, investment and energy to encourage the use of active transport; and,
- Availability of a wider range of bikes and scooters, including cargo bikes, e-bikes, folding bikes and share bikes, suitable to a broader range of people for a broader range of purposes.

The Gardiners Creek Trail within the City of Stonnington is considered a priority commuter route by the Department of Transport. Cycling counts show it is in high use, and is a significant commuter corridor.

Gardiners Creek Trail passes through numerous councils, including the cities of Stonnington, Boroondara, Whitehorse and Monash. As a trail in high demand from multiple users as well as traversing multiple stakeholders, the Gardiners Creek Trail will play a crucial role in the development of this masterplan.

GOVERNANCE CONTEXT

LAND OWNERSHIP AND MANAGEMENT

Within the masterplan context, Gardiners Creek corridor traverses numerous land ownerships and management authorities including Melbourne Water, the Department of Transport (Vic Roads) and the City of Boroondara.

Major portions of the shared-user path 'Gardiners Creek Trail' lie within the City of Boroondara, and numerous community groups such as Friends of Gardiners Creek, sporting clubs and other community members interface with the trail.

These various owners and managers have major influence over the creek's future and will be a major consideration in the planning of the future of Gardiners Creek (KooyongKoot), as the combined efforts of all stakeholders will be tantamount to the success of the creek.

Figure 03. - Sir Zelman Cowen Park

Figure 04. - Gardiners Creek Trail under Monash Freeway

Figure 05. - TH King Park

GARDINERS CREEK CATCHMENT CONTEXT

Gardiners Creek (KooyongKoot) is a tributary to the Birrarung (Yarra River), originating in the eastern suburbs of Melbourne and flowing through the council areas of Whitehorse, Monash, Glen Eira, Boroondara and Stonnington. The 112 km2 catchment is all urban, with several sporting ovals and a few wetlands within the creek corridor. The catchment has several tributaries, and a catchment analysis shows that 86% of the catchment is upstream of Stonnington. The creek is managed by Melbourne Water throughout its entirety. This includes stormwater drains, creeks, estuaries and more.

Increased frequency and intensity of storm events and sea level rise due to climate change will see increased pressure on Gardiners Creek (KooyongKoot), particularly downstream within the City of Stonnington.

MELBOURNE WATER - MELBOURNE HEALTHY WATERWAYS STRATEGY, 2018

The Melbourne Water Healthy Waterways Strategy 2018 documents the current condition, trajectory and desired vision for several values for all tributaries, including Gardiners Creek (KooyongKoot).

Gardiners Creek (KooyongKoot) only has a good condition rating for social values, with all environmental values being rated as very poor to moderate. This is consistent with social research that Melbourne Water initiated in the 1990s and 2000s, asking the community about their perception of waterways, and finding that Gardiners Creek (KooyongKoot) was a highly valued and used waterway, especially for recreational uses.

The vision and key objectives defined by Melbourne Water in their Healthy Waterways Strategy (2018), for the Yarra catchment, which includes the sub-catchment of Gardiners Creek (KooyongKoot) is:

“Our Yarra catchment waterways are increasingly protected, respected and collaboratively cared for by Traditional Owners, government and community as living and highly valued entities. They are a linked network of thriving corridor and in stream spaces that nurture biodiversity, deepen the relationship between people and nature, build resilience as our population grows and the climate changes, and contribute to wellbeing and liveability. Their ecological health and value to the community continuously improve through rehabilitated waterways and balanced uses.”

Within the Healthy Waterways strategy, there are a number of performance objectives that have been set by Melbourne Water:

“Identify litter hotspots and build targeted education programs and interception infrastructure. Work with councils and volunteer groups e.g. Blackburn Lake advisory committee. Develop new land owner waterway information pack with support from council and agencies – make consistent across catchment. Support large land owners to Develop revegetation programs. Provide seed funding guidelines and case study examples.”

The waterways strategy includes the identification and implementation of opportunities to reduce flow stress by addressing factors such as water for domestic and stock uses, the establishment of a vegetated riparian buffer and ongoing maintenance of existing vegetation at high priority ecological locations, the increase of visitor access to waterways from 73% to 75% by filling in gaps, improving connections, and increasing support for community groups and citizen science.

It is important that the future of Gardiners Creek (KooyongKoot) meets the objectives of Melbourne Water as a drainage corridor and an important ecological and social artery.

CURRENT WATER QUALITY

Water quality is monitored by Melbourne Water under their water quality monitoring program. There is only one site in the Gardiners Creek Catchment (Site code YAGAR0104), and this indicates that Gardiners Creek (KooyongKoot) has very poor water quality, as do most urban drains and tributaries in the Melbourne region. The creek is a major tributary of the Birrarung (Yarra River) and therefore has a considerable impact on the quality and health of the Birrarung (Yarra River) and Port Philip Bay.

An analysis of the downstream site at Glenferrie Road (this monitoring station is within the masterplan boundary) showed that the water quality is consistently rated as very poor. The water quality measured at this monitoring station, fails (i.e. doesn’t meet State Environmental Protection Policy for Victoria (Waters) targets). on several criteria:

- Arsenic (all the time)
- Cadmium (some of the time)
- Chromium (all the time)
- Dissolved oxygen (all the time)
- Nickel (some of the time)
- Lead (all the time)
- pH (most of the time)
- Salinity (most of the time)
- Nitrogen (all the time)
- Phosphorous (all the time)
- Water clarity (most of the time)
- Zinc (all the time).

These results indicate that the water quality (and hence the input of pollution through the stormwater system from this urban catchment) is having a very negative influence on the biota of the creek. There are impacts from changes to the channel, the banks and connectivity of the floodplain, and the opportunity to swim or play in the creek is not recommended.

There has been no assessment to date of E.coli, pathogens and sewer overflows in the creek, but it would be expected that these too are having negative impacts on the waterway health, and opportunity to swim.

Figure 06. - Gardiners Creek (KooyongKoot) as a concrete channel

Figure 07. - Bluestone weir at of Gardiners Creek (KooyongKoot)

Figure 08. - Gardiners Creek (KooyongKoot) adjacent to Malvern Valley Golf Course

To improve the water quality in Gardiners Creek (KooyongKoot) (in the Stonnington area of interest), requires change across all five council areas and changes to the way stormwater (quality and quantity) flows to the creek.

HYDROLOGY IN URBAN CREEKS

Gardiners Creek (KooyongKoot) originates near Blackburn and flows through Burwood and Malvern East before following the Monash freeway corridor to the Birrarung (Yarra River). The catchment of Gardiners Creek (KooyongKoot) extents into the municipalities of Whitehorse, Boroondara, Monash, Glen Eira and Stonnington. Major tributaries include:

- Back Creek
- Scotchmans Creek
- Damper Creek

At the uppermost end of Gardiners Creek (KooyongKoot), there is a split into Blackburn North and Blackburn South Drains.

Conceptually all urban streams can be managed to deliver increased biodiversity, amenity, water supply, groundwater recharge, and improved quality for flora and fauna. But in reality, there are several physical and economic constraints in retrofitting an urban catchment.

Understanding the flow regime of the site in question is critical to understanding how to deliver on the opportunities.

The catchment of Gardiners Creek (KooyongKoot) is heavily affected by flooding, with past years flooding causing significant infrastructure damage and widespread impact. The management of this over the past decades has been through concreting and canalisation of the creek at many locations along the water corridor and tributaries. This has been in part to better manage water flow and to historically realign creek bends for other purposes such as infill and development.

A major contributing factor of creek flooding over the past decades has been the major reduction in the amount of permeable surfaces, such as grass and gardens. This is due to the increased development and paved surfaces throughout the catchment due to growth in population, density of living and urban development. Due to this, much of the runoff from the Gardiners Creek catchment (854.4 mm of annual rain) is not being captured by permeable surfaces but is directed into the creek, and the Birrarung (Yarra River). This increase in water volume is a major contributing factor to higher and more frequent flooding.

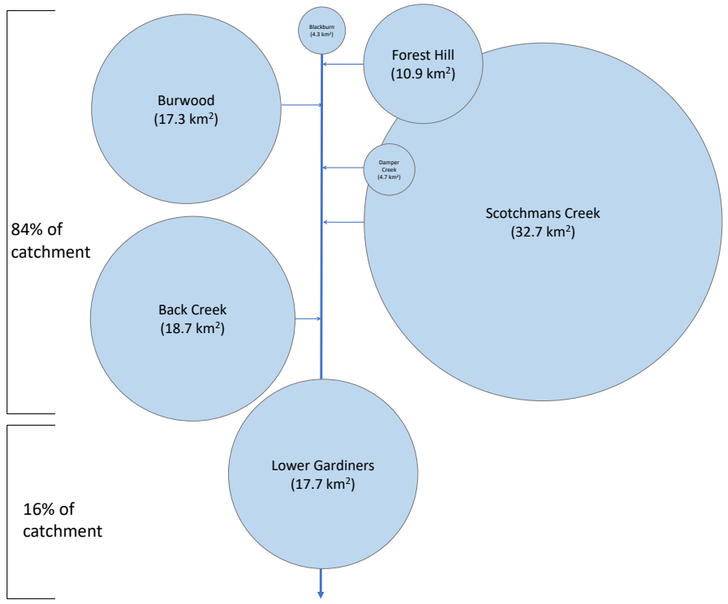


Figure 012. - Catchment breakdown of Gardiners Creek (KooyongKoot)

Figure 010. - Back Creek Reserve

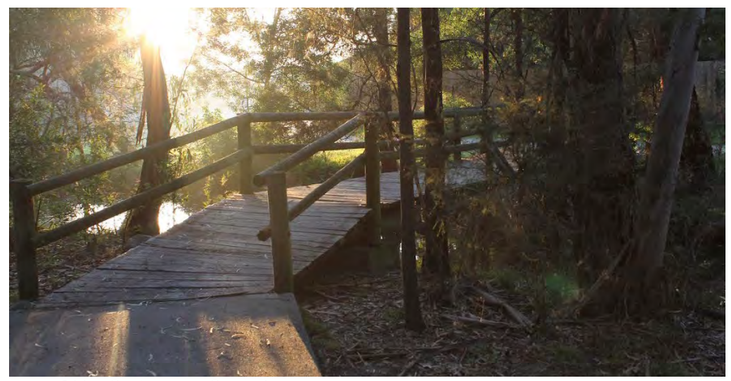


Figure 011. - Scotchmans Creek Reserve

Figure 09. - Gardiners Creek trail in Burwood

Figure 013. - Study area map

1.4. A Cultural Landscape

For thousands of years the traditional owners of Gardiners Creek (KooyongKoot), within the City of Stonnington, have lived, managed and celebrated the landscape of Gardiners Creek (KooyongKoot). It is recognised that the Boon Wurrung and Wurundjeri people are the traditional owners of the land.

This rich culture plays an important part in the life of Gardiners Creek (KooyongKoot), involving every being that lives, visits and partakes in the area. It is in the water that runs through creeks and swales, the birds and animals that make a home in the vegetation and inside the homes of families and businesses. Every person plays a critical role in the understanding, care, enjoyment and celebration of Gardiners Creek (KooyongKoot) as a landscape of first nations.

CLANS, COUNTRY & LANGUAGES

The language of the Melbourne area is collectively known as 'Kulin' or 'East Kulin' recognising that there are more languages than those spoken around Melbourne. The 'East Kulin' language has three dialects, Boon Wurrung, Woiwurrung and Daungwurrung. Linguists labelled these languages Kulin because this word is common to all the dialects and means 'man'.

The current City of Stonnington forms part of the Boon Wurrung language area. The northern boundary of the City of Stonnington, the Yarra River and Gardiners Creek (KooyongKoot), is approximately the boundary between the Boon Wurrung and their northern neighbour, the Woiwurrung. These waterways provided the Boon Wurrung and Woiwurrung with food including plants, eels, fish, mussels and waterfowl as well as being traditional camping places.

Yalukit Willam means 'river home or 'people of the river'. The country of the Yalukit-Willam clan covered all of the City of Stonnington with the exception of the small portion east of Gardiners Creek (KooyongKoot), which is Wurundjeri-balug (Woiwurrung).

In the 1830s the Yalukit-willam numbered at least 40 people. They were described as hunter-gatherers, however they also had highly efficient lightweight tools and land management practices such as fire-stick farming. They had two clan heads, Derrimut and Ningerranaro.

The Yalukit-willam people spoke the Boon Wurrung language. Boon being their distinctive word for 'no', and wurrung meaning 'lips', 'mouth', and 'language'.

EUROPEAN SETTLEMENT

Throughout the mid to late 1830s, the Port Phillip settlement, later to become known as Melbourne, grew steadily on the back of pastoral expansion. Boon Wurrung and Woiwurrung people continued to camp along the south bank of the Yarra River. The western end of Stonnington was a focus for government policy toward Aboriginal people of the Port Phillip district and a Native Police Corp was established in the late 1830s.

The present day City of Stonnington falls within what was the Western Port or Melbourne District of the Aboriginal Protectorate, established 1838-39, and the responsibility of Assistant Protector William Thomas. In the early period of his administration he spent considerable time moving between the Aboriginal camps along the Yarra River, several of them at Tromgin (Botanic Gardens) and Toorak and for a period of time located himself at the former site of Langhorne's establishment.

Early entries from Thomas's journal reveal that the Boon Wurrung and Woiwurrung had trouble obtaining game and plant foods in the vicinity of Melbourne after colonial settlement and were suffering from introduced diseases. When colonising the area, the Europeans objected to Aboriginal people hunting on the newly colonised lands and consequently they were forced to subsist by begging and cutting bark and firewood for the Europeans. During the late 1830s and early 1840s, Aboriginal camps continued to be broken up following complaints from Europeans. Aboriginal hardship was intensified because there was no bark left in the district and they were then compelled to build mud huts.

In 1849, a Select Committee on Aborigines and the Protectorate recommended the abolition of the Protectorate. The abolition heralded a decade of laissez-faire policy and neglect. William Thomas was retained as Protector of Aborigines for the whole Colony of Victoria, but concentrated his efforts in Melbourne. In 1852 Thomas secured a reserve for the Boon Wurrung at Mordialloc and a reserve at Warrandyte for the Woiwurrung. The Boon Wurrung, however, continued to visit Melbourne, camping at Fawkner Park and sites in the western end of Stonnington.

In 1863 a reserve was established at Coranderrk for east Kulin peoples. However, the Boon Wurrung, at that time comprising of nine elderly men and women, remained near Mordialloc and Cranbourne. Derrimut, a prominent Yalukit- willam leader, died in 1864 and Jimmy Dunbar, the last of the nine, died in 1877.

From the 1930s, the Indigenous history of Stonnington focuses on the activism of pro-Indigenous white residents, especially Helen Baillie, who opened her house in Punt Road to Aboriginal people from across the state from the 1930s to the late 950s. There is a continuum between Baillie's activism and that of later groups such as Action for Aboriginal Rights, the National Association for the Advancement of Native Race and Stonnington Citizens for Reconciliation.

The information in this document is derived from Stonnington's Indigenous history : An Indigenous History of Stonnington – A Report for the City of Stonnington (2006) by Dr Ian Clark and Laura Kostanski, University of Ballarat.

Figure 016. - Derrimut, Oil Painting, Benjamin Duterrau, 1837. Mitchell Library State Library of NSW.

Figure 017. - Indigenous smoking ceremony (S.C.C Reconciliation Action Plan (2018–2020)

FIGURE 10 - ABORIGINAL LANDSCAPE (PRE-1835)

500 0 500 1000 1500 METRES

CITY OF STONNINGTON BOUNDARY

LEGEND

- GRASSY WOODLAND/DAMP SANDS HERB RICH WOODLAND COMPLEX
- RIPARIAN WOODLAND
- SEDGY SWAMP WOODLAND
- HEATHY WOODLAND
- CREEKLINE HERB-RICH WOODLAND
- FLOODPLAIN RIPERIAN WOODLAND
- SWAMP SCRUB
- GRASSY WOODLAND
- PLAINS GRASSY WOODLAND
- VALLEY GRASSY FOREST
- CREEKLINE GRASSY WOODLAND
- AQUATIC HERBLAND
- BILLABONG
- SWAMPLAND

SOURCE: DSE BIOMAP
WATERWAY AND WETLAND INFORMATION PREPARED BY TONY FAITHFULL 2005

Figure 018. - Aboriginal Landscape (Pre-1835), Stonnington Thematic Environmental History

HISTORY

A new creek

In the late Tertiary period (~10 million years ago) the Nillumbik Terrain was uplifted and tilted towards the sea. As this occurred, streams began forming their courses through the Tertiary sands and Silurian bedrock to form valleys such as that of the Birrarung (Yarra River) and Gardiners Creek (Kooyongkoot).

Source: 'My First Photograph, Gardiner's Creek', by A.J. Campbell, Melbourne, Victoria, 1891

~10 million

~400 million

Geology Past

The geology of Gardiners Creek (KooyongKoot) sits on the layered sediments of the Dargile and Andersons creek formations. These consist of sediments of layered siltstones and mudstones & conglomerates of the Silurian Age (400 million years ago). This area underwent many changes including complete submersion in the Tertiary era.

Source: Aerial view c.1930 of the confluence of Gardiners Creek and the Yarra River showing the wide alluvial flats. Glenferrie Road passes from left to right through the middle of the image while the playing fields of Scotch College and Kooyong Tennis Stadium can be seen at the middle right.

A thriving ecosystem

Before the arrival of non-Aboriginal people, the Kooyongkoot Creek had adapted to many thousands of years of Aboriginal land management, such as bush burning, and the harvesting of local yams and wheat. The variety of local flora and fauna provided a rich diet that supported a large number of clans and nations. Species included possums, wallabies, waterbirds and fish. Many plants had medicinal uses well known to Aboriginal people.

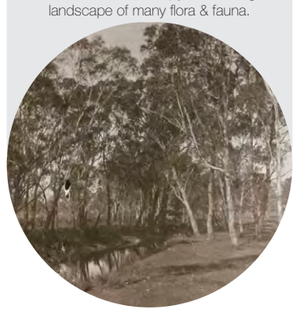
Source: Moreland Thematic History, City of Moreland pg 44
Image: Charles Troedel, 1864, Aborigines on Merri Creek

~4 million

Pre-Invasion

Native Environments

Between the period of Tertiary to the Newer Volcanics (4 million - now) lava flows from the north altered the paths of the Birrarung & Kooyongkoot which formed wide alluvial flats on the southern side of the creek. This formed a lush, vibrant swampy & billabong landscape of many flora & fauna.



Source: Gardiners Creek 1895

Settlers Past

As non-Aboriginal people moved into the land, much of the existing vegetation was cut down for firewood and building materials. As well as this, much of the land toward Gardiners Creek (KooyongKoot) was utilised for grazing for introduced species such as sheep and cattle. The hooved animals compressed the land, removing much of the native vegetation and making way for exotic species in an attempt to 'improve' farmers pasture.

John Gardiner became the first white settler on the southern side of the Birrarung (Yarra River), moving cattle in around 1835.

Source: Trove, 1873-1882 Junction of Gardiner's Creek and Birrarung (Yarra River)

1830s

1830s

The South Yarra 'Aboriginal mission'

In 1837, a mission was set up in South Yarra with the intention to settle the Aboriginal locals into villages and converting them to Christianity. In mid-1838, Aboriginal residents on the mission came to grief. This first involved the theft of potatoes from the land occupied by John Gardiner at the eastern edge of the mission. This incident is one of the few recorded instances of conflict between Aboriginal people and settlers in the present-day study area. Langhorne went to Gardiner's home after a number of mission residents told him that three people had been shot while stealing potatoes from Gardiner's field. Gardiner's men confirmed that a number of men had indeed been fired upon. Two of the men escaped across the river but one, Tullamarine, was knocked down with a musket-butt and captured. Tullamarine and another man involved in the theft, Jin-Jin, were subsequently arrested and committed to trial in Sydney. While in gaol, Jin-Jin and Tullamarine set fire to the prison's thatched roof, enabling Tullamarine to escape. Tullamarine, his wife and children left Melbourne and Langhorne recounted that two other families who had been residing on the mission intended to join them (Langhorne, G. 1838, Mission Report for April 1838 reproduced in Historical Records of Victoria vol. 2a, pp.213–14).

Urbanisation

Much of the land surrounding Gardiners Creek (KooyongKoot) was quarried for building materials, particularly bricks. During the 1850s gold rush, a lot of development occurred, with buildings, roads and railways popping up throughout the catchment.

Source: Boroondara Council, Gardiners Creek Plans of The County of Bourke 1835-1855

1850s-1860s

Finding a way

Up until 1857, people could only cross or access Gardiners Creek (KooyongKoot) by ferry or placed timber logs which often were impassable during flooding or rain. This changed in the 1850s and 60s with the building of timber bridges at Glenferrie Rd, Toorak Rd and High St. These bridges gradually degraded, and were replaced by brick and stone bridges in the 1890s and 1910s.

Source: Boroondara Council, Gardiners Creek (KooyongKoot) Truck Crossing Bridge 1950s

1850s-1860s

Source: 1915 Tooronga Rd, new bridge, Trove

Gardiner Valley Improvement Scheme

From 1904 - 1934, under the Gardiner Valley Improvement Scheme, Malvern Council purchased parcels of land along the flood plain of Gardiners Creek (KooyongKoot) to prevent building development in flood-prone zones.

A boulevard was constructed as well as a number of sports grounds and the Malvern Municipal Golf Links, which significantly changed the course of the creek, including the draining of wetlands and the planting of Exotic Oaks, Elms & Willows.

This is likely the earliest waterway linear park creation exercise in Melbourne.

Source: 'My First Photograph, Gardiner's Creek', by A.J. Campbell, Melbourne, Victoria, 1891

Creek Reconstruction

During the Great Depression of the 1930s the creek was straightened in sections by men on sustenance (welfare payments during the Depression).

Source: Gardiners Creek at Black Bridge showing workers excavating the present course of Gardiners Creek near East Malvern railway station, c1930.

Source: Gardiners Creek looking upstream from Tooronga Road, c1970 to 1986.

Water and movement

Much of the creek frequently flooded in parts of Ashburton and Glen Iris. However, it still retained its original state, with locals able to catch fish and tadpoles

Source: Unknown, Gardiners Creek; c.1990.

Weirs

Much of the creek from St Kevins College all the way to Patterson Reserve was concreted due to flooding, and many weirs were progressively installed further up the tributaries of the creek.

Source: MCGC, Gardiners Creek (KooyongKoot), c. 2019

Impact

Flooding frequently continued along Gardiners Creek (KooyongKoot) including significant storm damage in 2006 that wiped out the Solway Street footbridge.

Source: Unknown, Solway St Foot Bridge, East Malvern

1900s

1900s

1950s

1970s

1980s

2010s

FUTURE

1910s

Trains & Trams

The Outer Circle line was built to link Gippsland with North Melbourne through the eastern fringe of Melbourne, thus bypassing the city centre. The line was carried across Gardiners Creek (KooyongKoot) on a long timber trestle bridge, known as the Black Bridge. This bridge was on the site of the present day Malvern Valley Golf Course, and was demolished in 1938.

Black Bridge crossing Gardiners Creek showing workers excavating the present course of Gardiners Creek near East Malvern railway station, c1930.

Gardiners Creek Valley Study

Before the works of the Monash Freeway, the councils of Camberwell, Hawthorn and Malvern jointly undertook the Gardiners Creek Valley Study (1970s). This report proposed upgrades to Gardiners Creek Valley as an alternative to the proposed freeway, as well as highlighting the impact that the freeway would have on the corridor. This study is an in depth review of the environmental situation of the valley during the 70s which highlights many issues still present in the creek today, including unconsidered circulation, pedestrian links, and over use of sports facilities and community desire for native bushland.

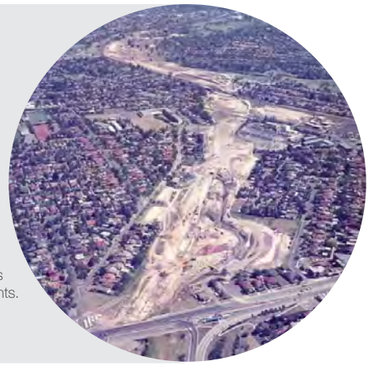
1970 - 90s

The Monash Freeway

During the 1970's plans were made to link Melbourne's first freeway with the South-eastern Freeway, through what was called the 'c3 route', which followed the Gardiners Creek Valley on the Malvern side.

The prospect of a freeway going through the then City of Malvern sparked unprecedented protest in the community and a number of activist groups formed. They protested against the proposed demolition of hundreds of houses that were in the path of the freeway, the loss of large areas of parkland and sports grounds, damage to the natural environment and the noise and pollution the freeway would produce. These protests delayed construction of the freeway for several years.

The 'c3 route' was eventually completed in the early 1990s, and the freeway name was changed to the Monash Freeway in 1999. The Monash Freeway now takes many thousands of cars daily through Stonnington to and from Melbourne's outer south-eastern suburbs, as well as providing access to the area for its residents. (Priestley, 1984:269–70; Strahan, 1989, ch.11; Iay, 2003:198 and 211–12)



1.5. Character overview of Gardiners Creek Corridor

Dominated by the Monash freeway/ CltyLink overpass, the creek and shared trail hang under the concrete structure; connecting to the Birrarung (Yarra River) Corridor and beyond.

The home of numerous sporting clubs and fields, surrounded by well-established leafy trees.

A wedge between city infrastructure, open woodlands — the local's sanctuary.

Narrow land parcel, inaccessible access transport reserve carved out by the Monash Freeway.

Narrow thoroughfare, vegetation, transformin ecology and community c

low lying
g into rich
ollaboration.

Semi native bush land, tranquil surrounds, winding around the creeks edge.

Creekside picnic, sporting facilities, fragrant gums, and urban wetlands clearing, creating, and educating.

Large open active parkland, clustered activation, sports ovals dominate.

18 hole, inner city golf course located on a large Council reserve. Majority of passive open space located on northern side of creek.

Site Extent

Stonnington LGA

0 100 200 300 400 m

City of
STONNINGTON

GARDINERS CREEK (KOOYONGKOOT)
MASTERPLAN

MCGREGOR
COXALL

ACKNOWLEDGEMENT OF COUNTRY

GARDINERS CREEK (KOOYONGKOOT) IS CULTURALLY SIGNIFICANT TO THE TRADITIONAL CUSTODIANS OF THE AREA KNOWN AS THE BOON WURRUNG AND WURUNDJERI PEOPLES OF MELBOURNE & PORT PHILLIP. THE WURUNDJERI STILL USE THE AREA TODAY AND THEIR HISTORY AND CONNECTION TO THE LAND IS DEMONSTRATED BY THE ABUNDANCE OF SIGNIFICANT RESOURCE MATERIALS THAT HAVE BEEN COLLECTED FROM WITHIN AND ADJOINING THE AREA OVER THOUSANDS OF YEARS.

WE ALL HAVE A RESPONSIBILITY TO SAFEGUARD, CELEBRATE AND TAKE AN ACTIVE INVOLVEMENT IN THIS CULTURE AND ITS FUTURE.

WE CONSIDER THE SIGNIFICANCE OF THIS PLACE AND ITS FUTURE, AS WE STEP OUT INTO IT.

WARNING: Aboriginal and Torres Strait Islander readers are warned that this document may contain images of deceased persons.

STONNINGTON CITY COUNCIL RECONCILIATION STATEMENT

THE COUNCIL OF THE CITY OF STONNINGTON ACKNOWLEDGES THAT BOON WURRUNG AND WURUNDJERI PEOPLES ARE THE TRADITIONAL CUSTODIANS OF THIS LAND AND HAVE STRIVED TO RETAIN THEIR IDENTITY AND CULTURES THROUGH MORE THAN TWO HUNDRED YEARS OF DISPOSSESSION AND COLONISATION.

COUNCIL RECOGNISES AND ACCEPTS ITS RESPONSIBILITY TO LEARN FROM, AND PROMOTE THE INTRINSIC VALUE OF ABORIGINAL AND TORRES STRAIT ISLANDER CULTURES, HERITAGE AND CONTEMPORARY ASPIRATIONS TO THE WIDER COMMUNITY, UNDERSTANDING THAT THIS ENRICHES AUSTRALIA'S HERITAGE AND OUR COMMUNITY.

COUNCIL ACKNOWLEDGES THE RIGHT OF ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES TO LIVE ACCORDING TO THEIR OWN VALUES AND CUSTOMS IN OUR DIVERSE COMMUNITY, SUBJECT TO AUSTRALIAN LAW.

COUNCIL RESPECTS BOON WURRUNG AND WURUNDJERI PEOPLES' SPECIAL RELATIONSHIP TO THE LAND AND RECOGNISES ABORIGINAL AND TORRES STRAIT ISLANDER SACRED SITES AND SIGNIFICANT PLACES.

COUNCIL RECOGNISES THE VALUABLE CONTRIBUTIONS TO VICTORIA MADE BY ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES AND WILL WORK TOGETHER TOWARDS A FUTURE OF MUTUAL RESPECT AND HARMONY.

2.0 Gardiners Creek (Kooyongkoot) Masterplan

2.1. Introduction

The masterplan sets the future direction of Gardiners Creek corridor within the City of Stonnington, providing an overarching vision, priorities for each key driver of the project, and a proposed masterplan for each character zone along the creek.

Each character zone has its own sub-vision to ensure the uniqueness and individual character of each site is recognised and enhanced, creating a sequence of spaces that provide difference and interest.

2.2. Commitment to collaborate

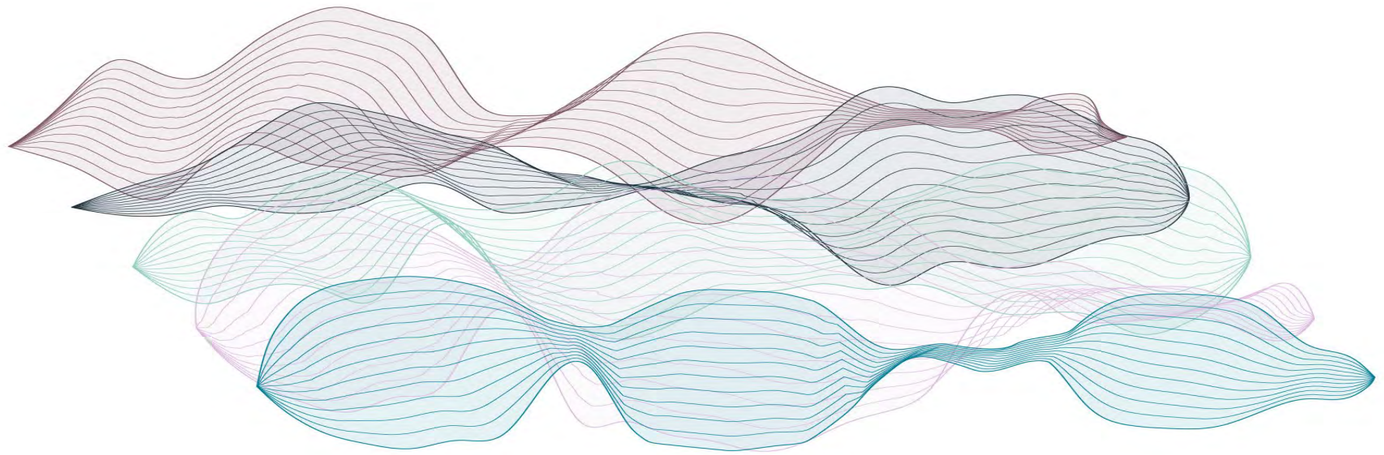
Achieving the vision of the Gardiners Creek (KooyongKoot) masterplan will require a collaborative effort, with the City of Stonnington working together with all that influence and interact with the area including surrounding councils, water, road and transport authorities, traditional owners, state and government representatives and most importantly, its local community.

The City of Stonnington is committed to working together with all key partners to create positive outcomes for the environment and the local community.

2.3. The Vision

The Gardiners Creek corridor will be a resilient environmental landscape nurturing the wellness of people and Country. As a loved community destination, it will form a vital link through the municipality, offering green respite from the urban surrounds with rich biodiversity and habitat.

The Gardiners Creek corridor will be a series of high quality areas along the length of the creek, creating a connected linear public realm for both people and the environment. As a key regional movement passage and a local destination, Gardiners Creek (KooyongKoot) will be a place that brings together the needs of all users, inviting people to linger longer, stop, breathe, and connect with Country. Maintaining its function as a waterway, the re-naturalised creek and riparian corridor will be the ribbon connecting all nodes. Displaying and embodying the rich cultural and natural values of the land, celebrating and narrating the creek's many stories, the corridor will enable people to engage with the landscape in multiple ways to create a meaningful experience.



2.4. Key Drivers

This masterplan uses six key drivers to analyse and understand the Gardiners Creek corridor and guide its future transformation.

These drivers have been developed with an understanding of Council and stakeholder aspirations, and the importance of the site at a city scale.

ACCESS AND CONNECTIVITY

The Gardiners Creek corridor is an important public space asset, providing an urban escape and opportunities for a multitude of recreational opportunities. Ease of access, connectivity and movement to and through the corridor for all users must be considered to ensure its success.

WATER - CATCHMENT, CONNECTIONS AND HEALTH

Gardiners Creek (KooyongKoot) is a key waterway within the City of Stonnington, and within the greater Melbourne context. Waterway health continues to be a crucial factor in supporting a sustainable city and needs to be considered in all planning and design.

OPEN SPACE - ACTIVE & PASSIVE RECREATION

As one of the major open spaces within the City of Stonnington, Gardiners Creek corridor provides important respite from the surrounding urban environment, with opportunities for passive and active recreation. It is important that the corridor continues to cater for the vast needs of the public as the city continues to grow and change.

BIODIVERSITY

As the climate changes and densification increases, the need to consider nature in the city has never been greater. There is a need to understand the importance of providing ample space, planning and maintenance for native flora and fauna to cohesively coexist along side other park uses.

CULTURAL VALUES

It is essential that the cultural values of Gardiners Creek corridor are known and celebrated into the future. The corridor needs to facilitate community awareness, education and cultural engagement.

GOVERNANCE

A creek corridor is influenced and invested in by all those who use it. This not only includes the City of Stonnington, but also surrounding councils, water, road and transport authorities, traditional owners, government representatives and most importantly, its local community. The delicate future of Gardiners Creek (KooyongKoot) lies in the hands of those who use and govern it, and will therefore have a key influence on the future of the corridor.

ACCESS AND CONNECTIVITY

Gardiners Creek (KooyongKoot) plays a key role in the movement and accessibility of the south-eastern suburbs of Melbourne. Its contextual placement before the Birrarung (Yarra River), gradual slope and synergistic character lend it to an active hub of life for many different uses.

The Gardiners Creek corridor provides a public space and urban escape for the community and visitors. The multitude of activities undertaken along the corridor such as sporting activities, cycling, running, passive recreation and respite highlight the need for ease of access into, through and out of the creek corridor. This requires the consideration of connectivity to local public transportation, bridge crossings, road and cycling infrastructure, pedestrian paths, parking, maintenance accessibility and more.

Gardiners Creek Trail is considered a Strategic Cycling Corridor by the Victorian Department of Transport. This route needs to cater for commuter cyclists and opportunities need to be found to separate users, particularly in high-conflict areas.

Issues:

- Conflict between cyclists and pedestrians sharing the same path.
- Conflict between high-speed and slow-speed users.
- Inconsistent light quality across Gardiners Creek Trail.
- Inconsistent path quality, path width, and finishes.
- Most car parks are at full capacity during sporting events and there is limited availability to increase car parking.

Opportunities:

- Improve cyclist, pedestrian, family and dog walking interaction along Gardiners Creek Trail by finding opportunities to separate users.
- Explore path alignment to mitigate user conflicts.
- Realign paths to create better view lines along shared user paths for cyclists and pedestrians.
- Provide rest points and bicycle facilities along paths to encourage wider use.
- Increase ease and legibility of connections to adjacent community centres and public transport.
- Encourage public transport use, access and carpooling, rather than increasing car parking numbers.

FUTURE POTENTIAL

Key Objective

'Create a safe, connected movement corridor that enables everyone to move at their own pace.'

Priorities

1. Promote the use of cycling as a commuting mode of transport.
2. Enable the corridor to be used by a broad cross-section of users.
3. Provide strategies to mitigate conflicts between different user groups.
4. Create safe, efficient routes to the creek corridor from key nodes and surrounding destinations.
5. Celebrate park entries.
6. Provide orientation points and wayfinding.

Strategies

Strategy 1: Establish Gardiners Creek Trail as a safe shared user path

- Upgrade all shared-user paths to be a safe and comfortable width and material, following current best-practice.
- Provide lighting along the trail to enable year-round commuter use.
- Provide sufficient cycling provisions along the length of the Gardiners Creek Trail at regular intervals such as tyre pumps, seating, shade, drinking water and bicycle parking.
- Separate conflicting activities, such as ball sports and cyclists, by utilising natural elements such as landform berms where space allows. These berms can also act as spectator seating.

Strategy 2: Celebrate parkland entries

- Strongly define primary and secondary access points to the Gardiners Creek corridor. The primary access points will have a strong, celebratory presence, inviting community and visitors into the park. Secondary access points will be upgraded, providing local entries for the surrounding community.

Strategy 3: Provide path loops and varying typologies

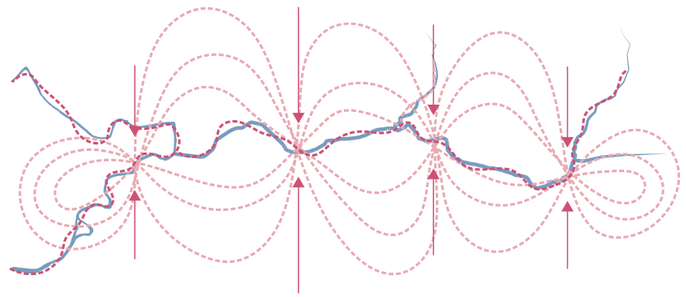
- Provide different path typologies along the length of the creek corridor that enables intuitive wayfinding and allows various connections and routes to be taken. This enables people to tailor their visit to their needs, providing choice of length and experience, allowing a different curated experience each visit.
- Establish an interlinked trail network within the corridor, connecting to other surrounding trails and key connections.
- Provide new trail options that encourage exploration and discovery.
- Utilise path materiality and wayfinding signage to aid wayfinding and user management.

Strategy 4: Enhance connections to public transport nodes

- Create safe, legible and easy connections to trains and other public transport from Gardiners Creek (KooyongKoot) to encourage users to utilise sustainable transport options.
- Improve connectivity, including connectivity to other shared user paths and local destinations such as schools and town centres.

Strategy 5: Frequent stopping points

- Provide stopping points along Gardiners Creek Trail and adjacent shared user paths to enable users to stop and rest with comfort.
- Locate stopping points to enable people to engage with the creek and surrounding landscape to enhance user experience and connection to country.



Creek length access with different experience loops.

WATER - CATCHMENT, CONNECTIONS AND HEALTH

Gardiners Creek (KooyongKoot) is a key waterway within the City of Stonnington, and within the greater Melbourne context. Waterway health continues to be a crucial factor in creating and supporting a sustainable city. As the climate changes and urban densification increases, there will be increased pressure on Gardiners Creek (KooyongKoot).

Issues:

- Water quality of Gardiners Creek (KooyongKoot) is rated very poor.
- Currently drainage into the creek is through pipes, it is mostly untreated and low water quality.
- Downstream flooding is an issue.
- Waterway health and environmental values are rated as poor.

Opportunities:

- Utilise water sensitive urban design to increase water quality of runoff into Gardiners Creek (KooyongKoot).
- Decrease stormwater run-off through the reduction of hardscape and the use of porous paving.
- Develop catchment-wide water management strategies; including water harvesting and reuse, to reduce flood volume and increase water quality.
- Improve interface and access to water to increase appreciation of the waterway.
- Harvest excess creek flows for water reuse in corridor.
- Utilise upstream offline storage to reduce flooding downstream.

FUTURE POTENTIAL

Key Objective

"Improve creek health by creating a resilient waterway that displays and celebrates its various states, positively responding to flood waters and high rain events."

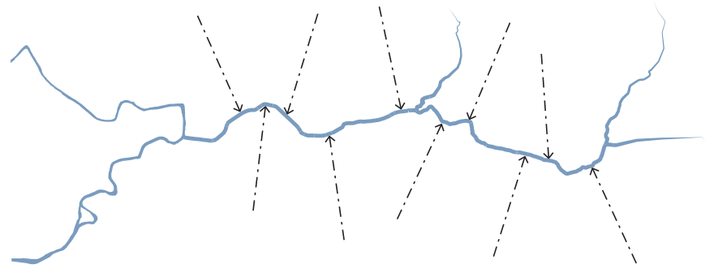
Priorities

1. Improve the health of Gardiners Creek (KooyongKoot) through water sensitive urban design (WSUD).
2. Reduce potable water consumption and maximise water reuse.
3. Reduce wastewater discharge.
4. Minimise stormwater pollution before it is discharged to the aquatic environment.
5. Maximise groundwater protection.
6. Promote and engage with catchment wide design interventions.
7. Reduce and manage flooding.

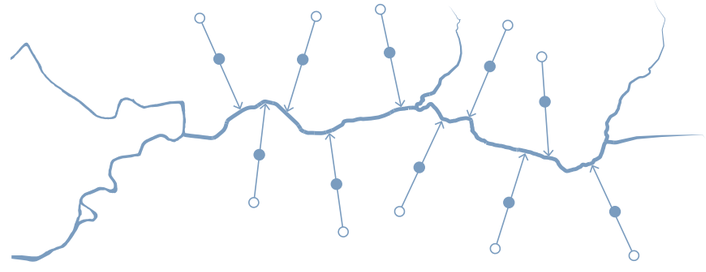
Strategies

Strategy 1: Water Toolkit

- Develop and deploy a select range of waterway health interventions, to be implemented at specific locations on site. Referred to collectively as a 'toolkit' that can be deployed as part of the Gardiners Creek (KooyongKoot) Masterplan. These assets may involve other agencies and private landowners where appropriate. The toolkit should include:
  - Swales
  - Raingardens
  - Wetlands
  - Water harvesting
  - Permeable paving
  - Litter traps
  - Vertical WSUD treatment
  - Offline storage



Existing Condition - Polluted waters entering Gardiners Creek (KooyongKoot)



Future Condition - Provide catchment interventions to cleanse water prior to entering creek

OPEN SPACE - ACTIVE & PASSIVE RECREATION

The Gardiners Creek corridor provides significant open space for the residents of Stonnington and surrounding municipalities. With open space at a premium in the city, the need to utilise the corridor in an efficient and effective manner for recreational pursuits is paramount. The existing and emerging community of Stonnington is diverse, with a range of abilities and interests. A key goal is to provide equitable access and ensure the park is inclusive, fostering sociability and community.

Issues:

- Minimal opportunity to access and engage with Gardiners Creek (KooyongKoot).
- Majority of large open space is utilised for active sports. There is a demand for more sports zones and areas for passive recreation.
- Conflict between ball sports and cycling trails that are in close proximity.
- Currently there are a lack of opportunities for seating and rest points along the creek length.

Opportunities:

- Increase opportunities for passive recreation along Gardiners Creek (KooyongKoot).
- Diversify the offering of sports facilities, such as outdoor fitness stations.
- Upgrade park facilities to be more efficient, multifunctional and environmentally sensitive.
- Better utilise areas of passive recreation, making them known and accessible.

FUTURE POTENTIAL

Key Objective

"Create high quality open space that caters for growing, changing community demands for open space."

Priorities

1. Diversify the active recreational offer for diverse interests and abilities enabling a wider user participation in the open space.
2. Provide more opportunities to engage with the creek and natural environment.
3. Enhance amenity value, design quality, identity and sense of space.

Strategies

Strategy 1: Clustered Activity

- Cluster, high activity zones, providing a concentration of activity, built assets, and people.
- Co-locate the majority of existing sports hub zones to consolidate built facilities.
- This is to minimize the unnecessary duplication of assets and facilities. The clustering of activity zones enables areas for quieter habitat focused zones.

Strategy 2: Provision of a range of sporting assets

- Where space permits, provide a range of sporting assets to cater to a wider group of potential users, including the enabling of women's sports.
- Update sports pavilions to cater to the broader range of park users, including female sports teams.
- Utilise land that becomes available from the consolidation, redesign and relocation of car parks for sporting assets to create additional facilities to facilitate the increasing demand for open space in the municipality.
- Provide outdoor fitness stations targeted at a broad range of age groups and abilities.

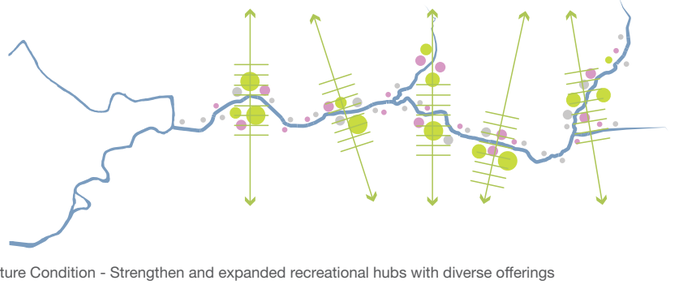
Strategy 3: Provide areas of respite

- Provide improved amenities along the creek such as barbecue facilities, water stations, lighting, tables, bins, shelters and car parking.
- Provide areas of passive recreation, encouraging and fostering community interaction and engagement.
- Provide smaller, dispersed areas of respite, quiet and contemplation.
- Provide places for larger community or Council organised events.
- Provide play spaces for older children and teenagers.
- Provide and encourage nature play or wild play.
- Enable connection to nature.

Strategy 4: Foster community spirit and interaction

- Utilise multi-functional sports pavilions, such as TH King Pavilion, to cater for a broader community use including education.
- Create spaces for social interaction.
- Create spaces for community groups such as schools, educational programs and social enterprises to utilise.
- Where possible, enable spaces to be universally accessible.

Existing Condition - Disparate disconnected sporting hubs



Future Condition - Strengthen and expanded recreational hubs with diverse offerings

BIODIVERSITY

As the climate changes and densification increases, the need to consider nature in the city has never been greater. Gardiners Creek (KooyongKoot) is a significant waterway in Melbourne's context however the current overall ecological condition of the masterplan corridor is moderately poor. While there are some sites of high ecological significance, many others are highly weed infested or highly degraded or have minimal biodiversity value.

Issues:

- Habitat along the length of the corridor is fragmented and disconnected.
- The corridor is heavily weed infested. High-priority weed species are common through the corridor.
- The current overall ecological condition of Gardiners Creek corridor is rated moderately poor.

Opportunities:

- Increase vegetation density and canopy cover to meet objective outlined in Stonnington Council's Urban Forest Strategy.
- Improve connectivity of biodiversity hotspots along the corridor and to adjacent corridors.
- Develop revegetation strategies using self germinating, low maintenance planting palettes.
- Where possible and appropriate, reintroduce the original native flora of the area — referencing the EVC's that once dominated the land — and increase habitat zones.
- Naturalisation of creek to significantly increase ecological value of creek and it's connection to the Yarra River.

FUTURE POTENTIAL

Key Objective

"Celebrate and enhance the endemic flora and fauna to create a rich, biodiverse corridor that connects to adjacent ecologies, strengthening the broader environmental network."

Priorities

1. Treat weeds prior to revegetation and vegetation.
2. Enhance and strengthen existing areas of high ecological value.
3. Connect areas of biodiversity.
4. Strengthen the habitat offer.
5. Establish Gardiners Creek (KooyongKoot) as a biodiversity corridor connected to the Yarra River.

Strategies

Strategy 1: Establish connectivity

- Connect the biodiversity corridor to the Yarra River. Complete the biodiversity connection of Gardiners Creek (KooyongKoot) to the Yarra River by completing revegetation works to join the last link between Glenferrie Road and the Yarra River.
- Create stronger connection between areas of high ecological value.
- Strengthen entire creek corridor connection.
- Advocate to naturalise key sections of Gardiners Creek (KooyongKoot).
- Connect the ecological and habitat values of the creek to its corridor.

Strategy 2: Increase ecological value

- Enhance areas of high biodiversity value (nominally Glen Iris Wetlands and Glenburn Bend Park) to embellish ecological structure to improve diversity and ecological value.
- Find opportunities for billabongs and wetlands to diversify ecology.
- Where appropriate, convert lawn to a more complex and rich ecology.
- Understand priority areas for vegetation upgrade – balance of ecological value, community value (signalling change, gaining community support to leverage future funding), leveraging off other work (other authorities, or necessary replanting/offset planting for building works).
- Convert 'leftover' and under-utilised areas into rich, layered biodiversity.

Strategy 3: Increase tree canopy

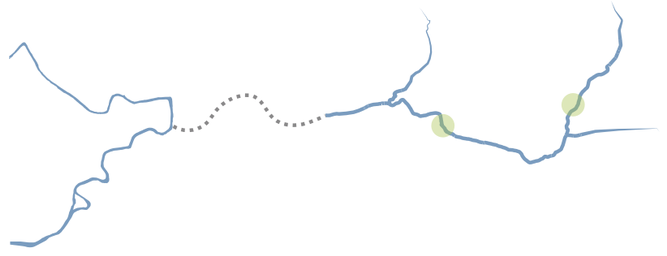
- Seek to increase tree cover to understanding that the corridor needs to contribute to a wider strategy to reduce the urban-heat island effect, and provide shade, cooling and habitat.
- Utilise succession planting to re-establish native cover understanding that while exotic tree species are not preferred, existing large tree specimens provide amenity, shade, habitat and carbon sequestration.

Strategy 4: Protect existing habitat

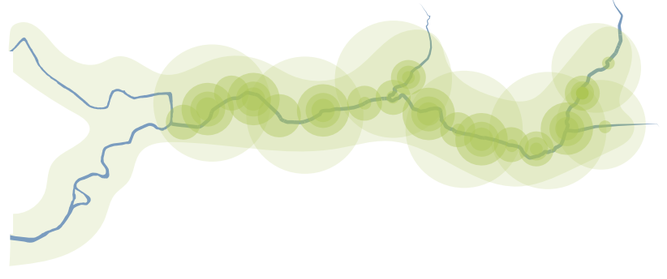
- Sensitively locate built infrastructure to minimise impacts on biodiversity.
- Where built infrastructure is located in areas with habitat value, employ ecologically sensitive design strategies.
- Where revegetation is proposed, utilise a staged approach so that at any point in time the total disturbed area is minimised.

Strategy 5: Planting

- New planting to be native to enhance habitat and provide food sources for wildlife.
- Utilise weed eradication methods prior to revegetation or regeneration of sites to help ensure the success of the planting.



Existing Condition - Fragmented Biodiversity



Future Condition - Creek-length high biodiversity connecting to other waterways

CULTURAL VALUES

Gardiners Creek (KooyongKoot) has a rich history of cultural influence, biodiversity and stories. It is essential that these cultural values are known and celebrated into the future. As the creek grows to incorporate multiple users, facilities and activities there will be an increasing demand of community awareness, movement, knowledge, engagement and direction into, through and around the corridor.

Issues:

- Cluttered and non-coordinated use of materials, furniture, signage across the different municipalities, create disconnected experience of corridor and lack of identity.
- Lack of story telling and connection to the creek's natural and cultural values.

Opportunities:

- Establish environmental and cultural educational programs for the broader community and school groups.
- Provide ways for the community to better engage with and learn about the creek corridor, enhancing community ownership.
- Utilise sound walls along Monash Freeway as opportunity for art.
- Utilise bridges for art and interpretation.
- Make stories of the creek legible and accessible.
- Reveal little known stories of natural, indigenous and settlement history of the creek's culturally significant landscape.

FUTURE POTENTIAL

Key Objective

"Establish a corridor rich in cultural connection to Country, boasting a vast range of varied engagement opportunities."

Priorities

1. Create a creek wide identity that transcends organisational boundaries.
2. Create spaces that enable community, sharing, events, and storytelling.
3. Develop upon the existing and much loved character of the corridor.
4. Enable education through landscape.
5. Use art and sculpture to add highlights along the corridor.

Strategies

Strategy 1: Creek Identity

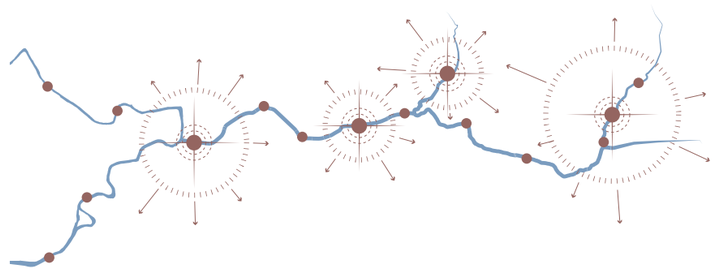
- Create an identity for Gardiners Creek (KooyongKoot) that connects and links the corridor through the use of a single suite of wayfinding, material and furniture palettes that extend across the creek and municipalities.
- Embed indigenous culture into the corridor, making it the glue, the consistent thread and integral to understanding and being in the space. Identify ways to incorporate indigenous culture into all development of the corridor.

Strategy 2: Create flexible gathering and event spaces

- Ephemeral exhibitions and cultural events could become an integral part of the area. The masterplan can facilitate these activities by providing appropriate spaces. Flexible event and gathering spaces are required which are appropriately scaled and provisioned.

Strategy 2: Create a cultural spine

- Provide cultural interpretation, sculpture and public art along the creek corridor to create a cultural spine. Utilise both permanent and changing art installations.
- Enable the provision of an educational trail for use by schools and community.
- Establish an interpretation strategy that would assist in:
  - Defining different places along the corridor;
  - Highlighting interesting features;
  - Celebrating the character of each place;
  - Making places feel safer; and
  - Aiding in wayfinding.
- Co-locate traditional owner stories with relevant current uses i.e. stories of Aboriginal children's games for learning coupled with sports areas, to provide connection to past and present.



A necklace of cultural gems

GOVERNANCE

A creek corridor is influenced and invested in by all those who use it. This not only includes the City of Stonnington, but also surrounding councils, water, road and transport authorities, traditional owners, state and government representatives and most importantly, its local community.

Gardiners Creek (KooyongKoot) is a dynamic corridor that fulfils various functions. Its ownership and management is however fragmented and complex due to the network of large critical city infrastructure that runs through and adjacent to the corridor.

The corridor is spread across multiple council and management boundaries. The creek corridor requires a collaborative approach with all stakeholders to achieve the best results for all parties.

Issues:

- Multiple and fragmented land owners and management has impeded holistic creek and catchment wide responses to major issues (such as flooding).
- Differing projects implemented by differing governing bodies has lead to a fragmented approach to upgrades.
- Resourcing and funding of projects by different governing groups has at times lead to narrow focused outcomes.

Opportunities:

- Establish a holistic creek-length vision.
- Create a consolidated and unified approach to corridor planning and design to allow for greater efficiency and clarity around design intent and project outcomes.

FUTURE POTENTIAL

Key Objective

“Enable a corridor that is supported by all its stakeholders with a shared vision for its future.”

Key Priorities

1. Collaboration and consolidation of a coherent creek vision between major stakeholders.
2. Work with large adjacent landowners to enable mutually beneficial projects.

Strategies

Strategy 1: Consolidated Stakeholder Group

- Work with key stakeholders within the Gardiners Creek catchment to form a collaborative group, which will take a whole-of-catchment approach to guide decision making, investment and maintenance of infrastructure.

A creek that benefits from all the pieces of its governance puzzle.

2.5. Future character zones of Gardiners Creek corridor

The following section explores the key drivers in a more localised context, outlining the vision and future character of each of the nine zones within the Gardiners Creek corridor.

ZONE 1: THE UNDERPASS

ZONE 2: THE SPORTING EXPANSE

ZONE 3: THE LOCAL OASIS

ZONE 4: THE HABITAT HIDEAWAY

ZONE 5: THE NARROW C

CONNECTOR

ZONE 6: THE BIODIVERSITY HUB

ZONE 7: THE WETLAND CULTIVATOR

ZONE 8: THE OPEN ACTIVATOR

ZONE 9: THE FOREST FAIRWAY

0 100 200 300 400 m

Glenburn Bend Park

TH King

Glen Iris Wetlands

Glen Iris Station

Darling Park

Darling Station

East Malvern Station

Malvern Rd

Burke Rd

Winton Rd

High St

Alamein Station

Holmesglen Station

Warrigal Rd

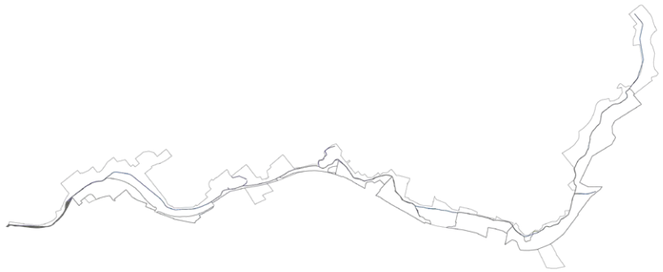
Malvern Valley Golf Club

Waverley Rd

Chadstone Shopping Centre

ZONE 1 : THE UNDERPASS

‘A unique spatial experience, heightened by art and installations’



EXISTING CONDITION

This zone is the gateway to Gardiners Creek Trail and the confluence of two major waterways - the Birrarung (Yarra River) and Gardiners Creek (KooyongKoot) - currently this important physical and cultural confluence isn’t celebrated.

The Underpass zone is dominated by the Monash Freeway which runs above Gardiners Creek (KooyongKoot). Gardiners Creek Trail is suspended from the freeway and creates a unique user experience for those on the elevated Shared User Path (SUP).

The SUP provides a gated connection to St Kevin’s college for student and faculty access, but no connection is provided to Scotch College. At peak times the SUP is too narrow, not providing for the different users and different speeds.

The highly degraded concrete-lined creek channel hosts minimal ecological value, dominated by Willow and Fraxinus weed species, very few native species exist.

At the bottom on the creek and catchment, the surrounding lands are prone to flooding.

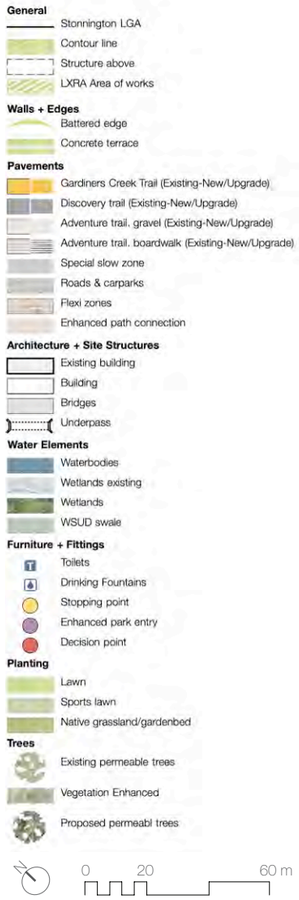
Ecological rating:

- Habitat score 17%
- Weeds = 0 (high coverage of significant weeds)

  Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- A gateway to Gardiners Creek Trail and into the City of Stonnington that celebrates the confluence of the two waterways with opportunity to stop, learn and reflect.
- A dynamic arts corridor offering a unique spatial experience, activating the ‘void spaces’ under the freeway.
- A space that displays the turning of an environmental challenge into an ecological opportunity.
- A safe active transport connection, providing ease of connection.



OPPORTUNITIES & PRIORITIES

Yarra Blvd

Yarra River

Scotch College

Glenferrie Rd

Kooyong Tennis Club

City of Boroondara

Monash Freeway

Gardiners Creek (KooyongKoot)

St Kevins College

A.1
Advocate to the Victorian Government for localised Shared User Path (SUP) bridge widening and break out space with seating and signage to celebrate the cultural and environmental significance of the creek's confluence, and Stonnington Council entry.

A.2
Advocate to the Victorian Government to increase access and connectivity to the Gardiners Creek Trail by enhancing the link to St Kevins College.

A.3
A.3 Advocate to the Victorian Government to increase access and connectivity to the Gardiners Creek Trail by investigating potential new link to Scotch College.

A.4
Advocate to the Victorian Government to use structural columns and undercroft for public art to create a unique experience for users.

A.5
Engage with St Kevins College to promote permeable paving in adjacent land to reduce water discharging into Gardiners Creek (KooyongKoot).

A.6
Advocate to the Victorian Government, VicRoadss, and TransUrban for vertical WSUD, treating water from the motorway before returning in to the creek.

A.7
Advocate to the Victorian Government to upgrade the existing suspended shared user path to create separate pedestrian and cyclist paths with improved lighting for safety and break out/rest stops to increase usability and enhance cyclist and pedestrian safety.

1.1 Install rain gardens to treat runoff from surrounding hardscape before entering Gardiners Creek (KooyongKoot).

A.8
Advocate to Melbourne Water for the removal and naturalisation of concrete canal.

1.2
Revegetation along western bank of Gardiners Creek (KooyongKoot), stretching from the mouth of the Yarra River to Glenferrie Rd for increased ecological value.

Utilise motorway runoff for irrigation.

ZONE 2 : THE SPORTING EXPANSE

SIR ZELMAN COWEN PARK

'A healthy and vibrant sports precinct for everybody, supported by a verdant tree canopy for improved amenity and comfort'

EXISTING CONDITION

Sir Zelman Cowen Park is a highly-used sporting zone, dominated by a range of sporting fields, car parking and various pavilions. The area is in particularly high use on weekends (when car parks are full) and after school, with organised sports that caters for the community and school groups.

The area is also heavily used by dog walkers who enjoy meandering the footpaths, and ovals when not in use. There is occasional conflict of dogs not on lead, cyclists and ball sports as all try to enjoy this space.

Close to Kooyong Station and Glenferrie Road tram line, the park is highly accessible.

The corridor site is dominated by lawn, and lacks ecological corridors between ovals. There are well-established native and non-indigenous trees however the zone is lacking in the understory and mid-story. Currently some recycled water is harvested from the creek and used for irrigation of the ovals.

Ecological rating:

- Habitat score = 28%
- Weeds = 2 (high coverage of significant weeds)
  Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- An active, social and community minded space that caters for a wide range of activities from dog walking to special events such as all-abilities festivals, farmers markets & passive recreation.
- A destination for sport and play.
- An open green space with distinct activity nodes, surrounded and embedded in native vegetation.

OPPORTUNITIES & PRIORITIES

2.1
Upgrade signage and way finding at Sir Zelman Cowen Park north, aiding in navigation to major local & regional destinations.

2.2
Create a landform berm with planting creating seating and protecting path users.

2.3
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

2.4
Investigate possibility of relocating entire car park to enable establishment of pedestrian/picnic area and pedestrian priority between sporting ovals.

2.5
New pedestrian crossing to increase pedestrian safety along proposed path.

2.6
Upgrade existing path typology to General Access Path along the northern edge of Sir Zelman Cowen Park.

2.7
Landform berm with tree planting creating seating and protecting path users.

2.8
WSUD treatment swale to treat storm-water before returning to Gardiners Creek (KooyongKoot).

2.9
Landform berm with tree planting creating seating and protecting path users without impeding on sports field use.

2.10
New barbecues and new shelter.

2.11
Install WSUD treatment swale to treat storm water before returning to Gardiners Creek (KooyongKoot).

2.12
Landform berm with tree planting creating seating and protecting path users.

2.13
Enhance vegetation buffer between open space and Monash Freeway to reduce impact of adjacent motorway.

2.14
Upgrade barbecues and park facilities.

2.15
Install WSUD treatment swale to treat storm water before returning to Gardiners Creek (KooyongKoot).

2.16
Explore opportunities to mitigate high conflict point along path.

2.17
Enhanced park entry & upgraded picnic facilities to create gateway to park.

2.18
Rest and fitness station points at intervals along path to enable pausing points to stop and enjoy open space.

2.19
New car parking between existing trees with permeable paving along southern side of access road to increase parking provision.

2.20
Explore opportunities for a shared-use agreement with Vision Australia for this sports ground.

2.21
New General Access Path along the south-west border of Sir Zelman Cowen Park.

Path to be coordinated with sporting clubs.

2.22
Upgrade car park facilities to meet regional play requirements. Upgrade to include WSUD and planting.

2.23
New regional all access, all abilities playground. Dispersed adventure play.

2.24
Enhance vegetation buffer between new playground and adjacent property to increase ecological value of site.

2.25
Informal social area under proposed shady trees with landform mounding for social interface between pavilion and oval ensuring not to impede views.

2.26
Formalise park entry to enhance community accessibility.

2.27
Extend recycled water reuse scheme. Increasing capacity to irrigate more ovals, reducing consumption of potable water.

2.28
Formalise park entry to enhance community accessibility.

2.29
New General Access Path to connect proposed shared user path.

A.9
Advocate to Melbourne Water for the removal and naturalisation of concrete canal.

City of Boroondara
Gardiners Creek Trail
Monash Freeway
Gardiners Creek (KooyongKoot)
HA Smith Reserve
McAlpine Sports Field
Righetti Oval
See Talbot Reserve Zone
Wadsworth Baseball Field
Peter Ferrie Oval
Peter Birrell Sports ground
Elizabeth St
Glenferrie Rd
Talbot Crescent
Kooyong Tennis Club
Kooyong Station

TALBOT RESERVE

'A quiet reserve supporting water cleaning and passive respite'

EXISTING CONDITION

Talbot Reserve is an area of parkland that has a residential pocket-park feel, with lawn and trees scattered in an informal manner. Within the reserve is a small sports field for juniors and informal sports and a sports pavilion that in its current state cannot support the needs of sporting clubs. The oval is adjacent to Sir Zelman Cowen Park, but currently feels disconnected by a car park that divides the two. This car park also dissects the main footpath.

Adjacent to the reserve will be the future elevated rail delivered by the Toorak Road Level Crossing Removal Project.

Similar to Sir Zelman Cowen, this area has well-established native and non-indigenous trees however the zone is lacking in understory and mid-story vegetation.

Ecological rating:

- Habitat score = 28%
- Weeds = 2 (high coverage of significant weeds)

  Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

CHARACTER:

Talbot Reserve

- A greener and finer grain extension of Sir Zelman Cowen Park, complementary in its recreational offer.
- An urban woodland with local-scale sports and recreation opportunities.
- A space for passive recreation and respite amongst dense tree canopies.

MCGREGOR COXALL

3.1
New sports and community pavilion at the time of redevelopment supplying high end gender inclusive sporting facilities. (Demolish existing facility)

3.2
Upgraded understory and tree cover to help achieve urban forest strategies.

3.3
New General Access Path to create the main trail along the northern edge of Sir Zelman Cowen Park away from recreation users. (Relocated from southern edge of park)

3.4
Install rain gardens, increasing water retention and treatment.

3.5
Enhance vegetation buffer between open space and Monash Freeway to reduce impact of adjacent motorway.

3.6
Enhanced park entry with upgraded signage and amenities to create gateway to regional park.

3.7
New play /picnic area.

3.8
Install rain gardens, increasing water retention and treatment.

3.9
Reconfigured flexible space at time of pavilion redevelopment enabling car parking and community events. (Demolish existing car park)

3.10
Retain existing path as pedestrian only path. SUP to east.

3.11
Rest and fitness station points at intervals along path.

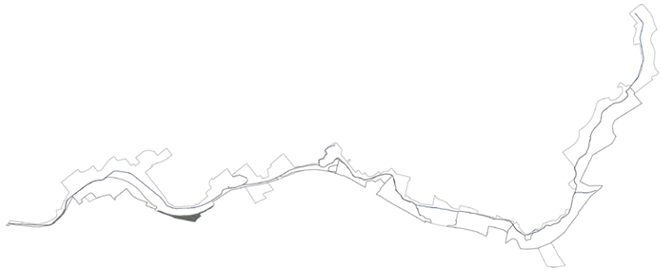
3.12
Enhanced buffer planting along the adjacent property boundary providing small trees and shrubs for small birds.

3.13
Reinstated planting on existing rail corridor to create a buffer between proposed rail works.

ZONE 3 : THE LOCAL OASIS

TOORONGA PARK

‘A tranquil and intimate local environmental retreat’



EXISTING CONDITION

Tooronga Park is a linear parkland tucked between the rail line and freeway. It is a locals park that is used predominately for dog walking and passive recreation.

Tall stands of trees create a wonderful character, with a feeling of seclusion from the urban surrounds. The park is a very open woodland comprising large areas of grassland and some shrubs and semi-established trees along with mature exotic native trees.

At the northern, narrow end, the future elevated rail is being delivered by Toorak Road Level Crossing Removal project.

To the south of the park, as a detention basin, the site is prone to flooding. Currently there is no mechanism for cleansing the stormwater that comes through the site.

Close proximity to Tooronga Station, Stonnington Council Depot and small commercial outlets on Milton Parade, the park currently provides open space/ break-out space though the play equipment within the park is disparate and under utilised.

Gardiners Creek Trail is on the other side of the freeway and creek, disconnected from this park.

Ecological rating:

- Habitat score = 40%
- Weeds = 13 (minimal coverage of significant weeds)

  Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- The northern end of Tooronga Park will be a new activity space delivered by the Toorak Road Level Crossing Removal Project. This will include nature play and fitness equipment.
- The southern side of the park will be an urban oasis linking blue and green infrastructure offering respite for local residents. It will be a wetland park offering moments of discovery and respite within an urban context.

MCGREGOR COXALL

OPPORTUNITIES & PRIORITIES

Auburn Rd

City of Boroondara

Toorak Rd

Gardiners Creek Trail

Gardiners Creek (KooyongKoot)

Monash Freeway

Tooronga Rd

Tooronga Park

Milton Parade

Tooronga Station

4.1
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

4.2
Rest and fitness station points at intervals along path to provide for a broader range of community members.

4.3
Enhance vegetation buffer between open space and Monash Freeway to reduce visual, audial and physical impact of adjacent motorway while increasing ecological value of park.

4.4
Upgrade existing path to General Access Path to create a safe trail along the southern side of Gardiners Creek (KooyongKoot).

4.5
New wetlands and WSUD treatment facility to treat storm water. Wetlands add public amenity and increase biodiversity.

4.6
New dispersed play & picnic facilities.

4.7
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

A.10
Advocate to Victorian Government for the removal of freeway signage to enhance open space amenity.

4.8
Upgrade existing path to General Access Path to connect to Tooronga train station. Portion of works to be delivered by LXRA.

4.9
Enhance vegetation buffer between open space and train line to reduce impact of adjacent rail corridor while increasing ecological value of park.

4.10
Enhanced park entry to Tooronga Park with increased signage and wayfinding to create gateway to park.

A.11
Advocate to Victorian Government for upgraded Shared User Path (SUP) connection to Tooronga train station.

4.11
Install new signage and way finding to connect Tooronga park, shared user paths, and the Gardiners Creek Corridor.

4.12
New park facilities. Shelter, bbq, play, seating and decking enabling increased community usage.

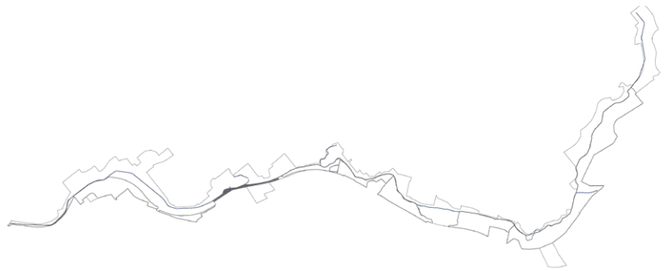
4.13
Enhance route legibility and safety for cyclists and pedestrians enabling safe connection along the southern corridor.

Eastern morning view of the new wetlands at Tooronga Park.

ZONE 4 : THE HABITAT HIDEAWAY

TRANSPORT RESERVE

'A habitat sanctuary'



EXISTING CONDITION

This zone is inaccessible to the public and is accessed for maintenance via Monash Freeway.

There is a steep, vegetated embankment along the length of the zone, with varying levels of canopy and understory cover.

FUTURE CHARACTER

- Inaccessible to the public, this linear length of vegetation will be a habitat sanctuary. Considerable revegetation and habitat creation will allow flora and fauna to flourish.
- Provide a naturalised creek edge to view from Gardiners Creek Trail to the north.

MCGREGOR COXALL

OPPORTUNITIES & PRIORITIES

ZONE 5 : THE NARROW CONNECTOR

‘A bushland corridor’

EXISTING CONDITION

Characterised as a long, linear reserve, this area serves predominately as a thoroughfare, with Gardiners Creek Trail meandering along its length. The trail is exposed with minimal shade, particularly the southern section of the trail.

There is an extremely high variation in percentage cover of vegetation. Vegetation areas are both native and weedy, and along the length there are representatives of all high-priority weeds. The existing native vegetation patches have minimal representatives of EVC. Transmission lines overhead constrain vegetation opportunities.

Sections of concrete canal channels impede habitat and aquatic fauna connections along Gardiners Creek (KooyongKoot).

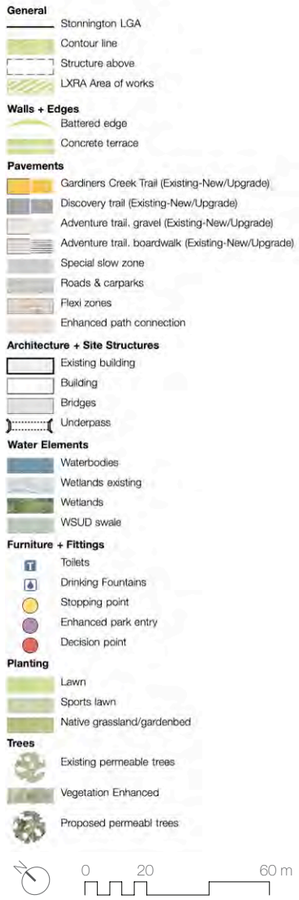
Ecological rating:

- Habitat score = 16%
- Weeds = 0 (high coverage of significant weeds)

  Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- A convenient transport corridor, the trail will move through native vegetation with segments of tree shade, offering moments to stop off and rest, with constant views to the creek.
- A shrubby landscape for small bird life.



A.15
Advocate to Melbourne Water for the removal and naturalisation of concrete canal.

6.1
Proposed permeable revegetation along eastern creek edge, allowing views to the waterway.

6.2
Install rain gardens, increasing water retention and treatment.

6.3
Infill of permeable vegetation between creek and trail. Retaining views to the waterway.

6.4
Reconfigure and consolidate carpark with WSUD swale to improve function & treat water runoff from hardstand

6.5
Rest and fitness station points at intervals along path to enable pausing points to stop and enjoy open space.

6.6
Enhance vegetation buffer between open space and Monash Freeway to reduce impact of adjacent motorway.

6.7
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

6.8
Upgrade existing carpark with WSUD swale to treat water runoff from hardstand.

6.9
WSUD swale, treating water from the motorway before entering the creek.

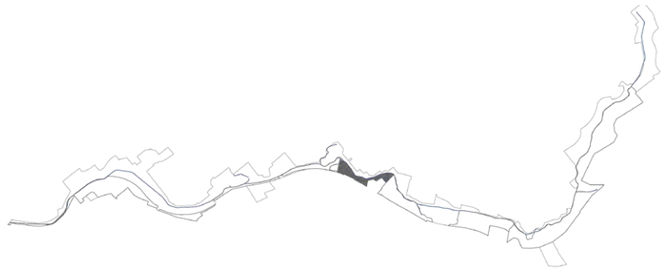
6.10
Enhanced buffer planting along the adjacent property boundary.

6.11
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

ZONE 6 : BIODIVERSITY HUB

GLENBURN BEND PARK

'Where the city meets the tranquil creek's edge, an area rich in ecology and community'



EXISTING CONDITION

Glenburn Bend Park is a biodiversity hotspot maintained by Council and the Friends of Gardiners Creek Valley. There is minimal weed cover and extremely good native cover, though many large mature woody weeds are present along the creek line edge. Disconnected from the Gardiners Creek Trail, a gravel path invites users to explore the parkland.

Gardiners Creek Trail runs long Brixton Rise where there is a small commercial interface and local community hub. Informal tracks have been made to the creek's edge, and there is a feeling of remoteness and discovery as one makes their way down. Currently no formal connection to the creek exists.

The park is connected across the Monash Freeway by two pedestrian overpasses, one of which connects to Glen Iris Station.

Ecological rating:

- Habitat score = 48%
- Weeds = 12 (low coverage of significant weeds)

Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- A connected biodiversity hotspot.
- Where the built environment meets the creek, encouraging connection and fostering cross engagement.
- A community lead space. A celebration of native vegetation and community engagement. An area that fosters and nurtures positive community interaction.
- A place for relaxation and re-connection with nature.
- An area to meander and discover secret, intimate spaces along the creek.
- A stop along the journey, supported by commercial and retail offerings.

OPPORTUNITIES & PRIORITIES

A.16
Advocate to State/ Federal Government for support to upgrade bridge.

7.1
Create novel habitat construction to help fauna thrive, eg. nesting boxes.

A.17
Engage with the Boroondara Council and other adjacent councils to create a consistent design theme across the creek corridor.

7.2
New gravel path in Glenburn Park to increase passive recreation.

A.18
Advocate to State/ Federal Government for support to upgrade bridge.

A.19
Engage with Boroondara Council to expand path network on both sides of Gardiners Creek (KooyongKoot), to separate high speed path users from recreational assets.

7.3
Upgrade existing informal path to steel boardwalk, with stopping points for viewing to increase passive recreation.

7.4
Prune existing vegetation creating permeability, allowing views to the waterway.

7.5
Upgrade informal path to Boardwalk to increase passive recreation.

7.6
Infill vegetation between creek and trail to increase vegetation canopy.

7.7
Buffer re-vegetation along High Street to reduce visual impact of busy urban road.

7.8
New 2.4m wide boardwalk under Glenburn Bridge to separate cyclists and slow-speed users.

7.11
Upgrade Informal path to gravel pathway to increase passive recreation.

7.10
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

7.12
Provide areas of respite with seating and interpretation to enjoy natural beauty of Glenburn Park.

7.9
Create formal track from overpass to trail to increase connection to Gardiners Creek Corridor.

A.20
Engage with Friends of Gardiners Creek Valley to expand the scope of Friends of Gardiners Creek Valley's revegetation program beyond Glenburn Park. Provide informative and educational signage.

7.13
Enhance vegetation buffer between open space and Monash Freeway to reduce impact of adjacent motorway.

7.14
New gravel path in Glenburn Park to increase passive recreation.

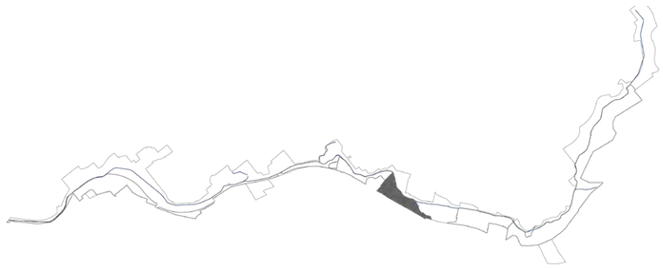
7.15
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

Gardiners Creek Trail
Elm Rd
Glenburn Bend Park
Kerferd Rd
City of Boroondara
Gardiners Creek (KooyongKoot)
Brixton Rise
High Street
Monash Freeway
Carroll Crescent
Glen Iris Station
TH King

ZONE 7 : THE WETLAND CULTIVATOR

T.H KING & GLEN IRIS WETLANDS

'Creekside picnic, sporting facilities, fragrant gums, and urban wetlands clearing, creating, and educating'



EXISTING CONDITION

TH King oval and surrounds contrast in character to the neighbouring Glen Iris Wetlands.

TH King oval and surrounds provide a sports oval, multi-use pavilion as well as a picnic pavilion and barbecue facilities in an idyllic spot by the creek. There is high demand for this picnic spot on warm weather weekends.

Gardiners Creek Trail runs through this section before redirecting over the creek as it reaches Glen Iris Wetlands.

Glen Iris Wetlands is an important biodiversity and habitat hotspot. The wetlands provide dense native vegetation including small trees and understory, catering to a wide variety of faunal needs. The wetlands are loved by those who visit, but its existence is unknown by many.

Creek borders overall dominated by large European weeds and high-priority weeds.

Ecological rating:

- Habitat score = 49%
- Weeds = 11 (low coverage of significant weeds)

Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- A community and environmental hub enabling education and engagement.
- Teeming with life, this landscape is a haven for wildlife.
- A cool, tranquil, green environment with dappled light.
- Distinctive spaces that are connected with a single identity.
- An audible experience with the sound of water, birds singing and frogs (ngarrert) calling.
- A place to explore the different ecosystems which support a variety of wildlife with moments to interact with the water. A space to meander, observe and retreat to.
- Retention and enhancement of conservation character of the area.
- A special space for Traditional Owners.

MCGREGOR COXALL

8.1
Terrace down to creek. Concrete seater steps with grass infill enabling creek engagement.

8.2
Upgraded Shelter, BBQ and seating. Relocate and upgrade play facilities and re align path to consolidate public amenity.

8.3
New Slow Zone and realigned path to reduce conflict between high speed path users and public amenity facilities.

A.21
Engage with Boroondara Council to expand path network on both sides of Gardiners Creek (KooyongKoot), to separate high speed path users from recreational assets.

8.4
New Slow Zone and realigned path to reduce conflict between high speed path users and community recreation use.

8.5
Terrace down to creek. Concrete seater steps with grass infill enabling creek engagement.

8.6
Uplifting of trees and reducing height of existing understory to create permeability along creek edge, allowing views to the waterway.

8.7
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

8.8
Upgrade existing boardwalk to enable wetland engagement.

8.9
Enhanced park entry. Upgraded signage, way finding, creating a feature to TH King Reserve.

8.10
Formalise entry & install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

8.11
Upgrade existing carpark with WSUD swale to treat water runoff from hardstand.

8.12
Extend recycled water reuse scheme. Increasing capacity to irrigate more ovals, toilet facilities reducing consumption of potable water.

8.13
Landform berm with planting creating seating and protecting path users.

8.14
New General Access Path to connect the southern user catchment to Gardeners Creek Trail.

8.15
Potential future use for cultural and outdoor education subject to outcomes of future sporting facilities review.

8.16
Upgrade boardwalk lookout and bird hide to enable wetland engagement.

8.17
Enhance ecological value with selected planting and weed removal.

A.22
Advocate to State/ Federal Government for support to upgrade bridge.

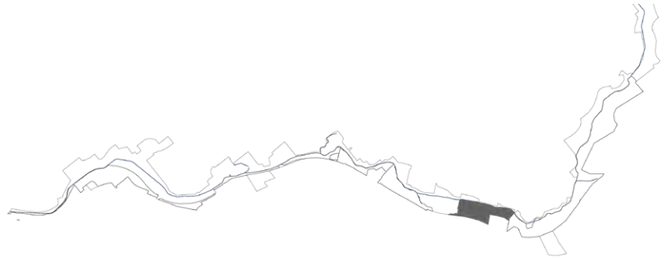
A.23
Advocate to Victorian Government for existing pedestrian underpass upgrade with new lighting & public artwork.

Midday westerly view of the upgraded and consolidated picnic zone at TH KING at the edge of Gardiners Creek (KooyongKoot).

ZONE 8 : THE OPEN ACTIVATOR

DARLING PARK

‘A broad open parkland catering to broad community needs’



EXISTING CONDITION

Darling Park is a sports dominated, vast parkland. Its four sports ovals are surrounded by trees and vegetation, with many semi-mature eucalyptus species found. Catering predominantly to the community’s sporting needs, the park is also used by joggers, walkers and dog walkers.

A small amount of play facilities and small picnic and barbecue facilities located amongst the trees. In this vast parkland facilities are somewhat disparate and disconnected.

The parklands host good corridors of native vegetation, with varying percentage of cover, and highly modified from their historic EVC. Many highly invasive, though juvenile weeds are present.

Ecological rating:

- Habitat score = 37%
- Weeds = 7 (moderate coverage of significant weeds)

  Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

CHARACTER

- A sports and recreation hub catering for a range of age groups embedded in native vegetation.
- A parkland and creek corridor inviting picnics and engagement along the waters edge.
- An internally connected landscape enabling intuitive wayfinding.

OPPORTUNITIES & PRIORITIES

9.1
Enhanced park entry. Upgraded signage, way finding, creating a feature to Darling Park North.

9.2
Buffer re-vegetation along Dunlop Street to reduce visual impact of busy urban road.
Ensure appropriate species under power lines.

9.3
New signage and intersection approach to junction aiding in the safe navigation to major local & regional destinations.

9.4
Grass landform berm with planting creating seating and protecting path users.

9.5
Riparian vegetation upgrade to strengthen biodiversity.

9.6
Gravel Adventure Paths to nature art/ sculpture/ play nodes.

9.7
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

A.24
Advocate to State/ Federal Government for support to upgrade bridge.

9.8
Grass landform berm with planting creating seating and protecting path users (if space permits).

9.9
Upgrade to 3m wide shared user path for consistent trail treatment.

9.10
New lawn, picnic and play facility to consolidate quality public amenity for community use.

9.11
New Slow Zone through pedestrian priority areas to reduce conflict between high speed path users and community recreation use.

A.25
Engage with Boroondara Council to expand path network on both sides of Gardiners Creek (KooyongKoot), to separate high speed path users from recreational assets.

9.12
Terrace down to waters edge to create greater creek engagement.

9.13
New planting around oval providing shade for spectators and increased canopy cover.

9.14
Grass landform berm with planting creating seating and protecting path users (if space permits).

9.15
Upgrade permeable creek riparian vegetation to strengthen biodiversity and increased visibility to the creek.

A.26
Advocate to State/ Federal Government for support to upgrade bridge.

9.16
Install new signage and way finding at key junction, informing the community of the Gardiners Creek Corridor.

9.17
Upgrade pedestrian and cycle link through car park to create safe link to Darling Park North.

9.18
Play and seating through the use of grass landforms.

9.19
Improve interface between carpark and path to provide clear wayfinding to surround park features.

9.20
Adventure nature play on the hill amongst trees.

9.21
New picnic and play facilities to create an activity zone connecting both ovals.

9.22
Enhance vegetation buffer between open space and Monash Freeway to reduce impact of adjacent motorway.

9.23
New gravel adventure trail connecting Gardiners Creek Trail to pavilion and toilets.

9.24
Reconfigure and consolidate car park. Carpark with WSUD swales to treat water runoff from hardstand.

9.25
Reduce existing car park width and utilise a higher quality paving to create a flexible community space and car park, allowing for activities such as community events. Create swales along carpark

9.26
New gravel adventure trail to link Winton Rd to proposed flexible community space.

9.27
Buffer re-vegetation to Winton Rd to reduce visual impact of busy urban road.Ensure appropriate species under transmission lines.

City of Boroondara
Gardiners Creek Trail
Gardiners Creek (Kooyongkoot)
Dunlop St
Pitt St
DW Lucas Oval
Basil Oval
Stanley Grose Oval
Stanley Grose Dr
Winton Rd
Malvern Valley Golf Course
Darling Station
Monash Freeway

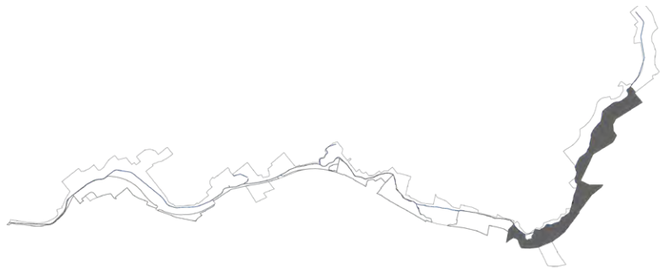
MCGREGOR COXALL

Aussie rules season at Darling Park - eastern view from Basil Park to picnic zone.

ZONE 9 : THE FOREST FAIRWAY

MALVERN VALLEY GOLF COURSE

'Tranquil recreation, bound by rich ecology, adapting to the needs of a dynamic urban environment'



EXISTING CONDITION

Malvern Valley Golf Course is a long, vast green space in a highly urbanised area. As a public golf course it's dominant use is for paid users of the golf course.

Situated alongside Gardiners Creek (KooyongKoot), and within a floodplain, the golf course is in an idyllic setting providing respite for users. Tributaries, such as Scotchmans Creek, cross the golf course and enter into Gardiners Creek (KooyongKoot).

Prior to European Settlement the Golf Course comprised of two distinct vegetation communities, both of which are still present. The Floodplain Riparian Woodland EVC 56 is present across the northern half of the site, in close proximity to Gardiners Creek (KooyongKoot) and the existing golf course wetlands. The Plains Grassy Woodland EVC 55 dominates the drier more elevated positions across the site. Although both of the vegetation communities have established canopy cover that come close to the requirements for their respective EVC, both are severely lacking in any understorey life forms.

Ecological rating:

Grassy Plain Woodland

- A Habitat score = 27%
- Weeds = 7 (moderate coverage of significant weeds)

Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

Floodplain Riparian Woodland

- A Habitat score = 16%
- Weeds = 0 (High coverage of significant weeds)

Score rating 0 -15. 0 = High coverage, 15 = Weed-free.

FUTURE CHARACTER

- Recreation surrounded by rich biodiversity.
- An adaptable landscape changing with the climate and weather.
- A cleansing landscape reducing nutrient rich water runoff into Gardiners Creek (KooyongKoot).
- Seamless connections from transport to creek.

FUTURE OPPORTUNITY

A future option could create detention of anywhere from 50,000 m3 to 200,000 m3 of space to retain flood waters that flow from the upstream urban areas of Gardiners Creek (KooyongKoot). A reshaped golf course could act as a wetland, storage and harvesting system and iconic piece of green infrastructure in the middle of this urban catchment. The concept itself is to create an off stream flow path, and a series of different depressions and different depths in a large open environment like the golf course. Other retarding basins like this in the city include Lewis Park (Knox) and Jacana Wetland (Moreland). The benefits of this type of option are that it could:

- Reduce peak floods, in minor to major flooding;
- Capture flows from Scotchman's Creek;
- Reduce the impact of flooding (ie litter and erosion) on the lower section of Gardiners Creek (KooyongKoot) and reduce maintenance costs;
- Provide urban cooling to the area; and
- Add to the biodiversity value of the area, and potentially connect with the Glen Iris Wetlands .

To effectively manage flooding and improve the quality of the Gardiners Creek (KooyongKoot), this option alone would not be enough, and a catchment wide solution is required with buy in from all councils and Melbourne Water.

OPPORTUNITIES & PRIORITIES

10.1
Buffer re-vegetation to Winton Rd to reduce visual impact of busy urban road.

10.2
Provide a trail link on City of Stonnington side of creek to expand path network on both sides of Gardiners Creek (KooyongKoot).

A.27
Advocate to State/ Federal Government for support to upgrade bridge.

10.3
Install WSUD, treating water from storm water pipes before returning in to the creek.

10.4
Vegetation upgrade enabling visual permeability to creek.

10.5
Buffer riparian vegetation upgrade to increase biodiversity value.

10.6
Potential future land manipulation to create offline water storage to help decrease flood risk.

A.28
Advocate to State/ Federal Government for support to upgrade bridge.

10.7
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

10.8
WSUD, treating water from storm water pipes before returning in to the creek.

10.9
Create a buffer of planting and swale along creek edge to filter golf course water run-off.

10.10
WSUD, treating water from storm water pipes before returning in to the creek.

10.11
Enhance vegetation buffer between southern edge of golf course and adjacent property boundary.

10.12
WSUD treatment swale to reduce nutrient loads from water runoff from golf course.

10.13
Re-vegetation within 'the rough' of golf course to provide greater habitat. Ensure appropriate species under powerlines.

10.14
Upgrade and widen path, establish WSUD treatment pond adjacent with new permeable border planting to increased pathway safety and storm water treatment.

10.15
Key connection to the Scotchmans Creek Trail and Strategic Cycling Corridor.

Install new signage and way finding at key junction, informing the community of the Gardiners Creek Corridor.

10.16
Re-vegetation within 'the rough' of golf course to provide greater habitat.

10.17
Buffer re-vegetation along southern edge of golf course and adjacent property boundary.

10.18
Explore options to reduce fertilisers used on golf course.

Winton Rd
City of Boroondara
Gardiners Creek Trail
Gardiners Creek (KooyongKoot)
Malvern Valley Golf Course
Monash Freeway
East Malvern Station

OPPORTUNITIES & PRIORITIES

General
- Stonnington LGA
- Contour line
- Structure above
- LXRA Area of works

Walls + Edges
- Battered edge
- Concrete terrace

Pavements
- Gardiners Creek Trail (Existing-New/Upgrade)
- Discovery trail (Existing-New/Upgrade)
- Adventure trail. gravel (Existing-New/Upgrade)
- Adventure trail. boardwalk (Existing-New/Upgrade)
- Special slow zone
- Roads & carparks
- Flexi zones
- Enhanced path connection

Architecture + Site Structures
- Existing building
- Building
- Bridges
- Underpass

Water Elements
- Waterbodies
- Wetlands existing
- Wetlands
- WSUD swale

Furniture + Fittings
- Toilets
- Drinking Fountains
- Stopping point
- Enhanced park entry
- Decision point

Planting
- Lawn
- Sports lawn
- Native grassland/gardenbed

Trees
- Existing permeable trees
- Vegetation Enhanced
- Proposed permeabl trees

0 20 60 m

11.1
WSUD, treating water from storm water pipes before returning in to the creek.

11.2
Upgrade riparian vegetation through planting infill to increase biodiversity value

11.3
Potential future land manipulation to create offline water storage to help decrease flood risk.

11.4
Localised pruning of existing vegetation creating permeability, allowing views to the waterway.

11.5
Re vegetation around existing waterbodies to increase biodiversity value and water quality.

11.6
Re-vegetation within 'the rough' of golf course to provide greater habitat opportunities.

11.7
Enhance vegetation buffer between southern edge of golf course and adjacent property boundary.

11.8
Re-vegetation within 'the rough' of golf course to provide greater habitat opportunities.

11.9
Enhance vegetation buffer between southern edge of golf course and adjacent property boundary.

11.10
Continue to re-vegetate Scotchmans Creek to increase biodiversity and water quality.

11.11
Reconfigure and consolidate car park. Carpark with WSUD swales to treat water runoff from hardstand..

11.12
Enhance vegetation buffer between open space and Monash Freeway to reduce impact of adjacent motorway.

Malvern Valley Golf Course
Malvern Valley Golf Club
City of Boroondara
Gardiners Creek (Kooyong)
Monash Freeway
East Malvern Station
Waverley Rd

MCGREGOR COXALL

OPPORTUNITIES & PRIORITIES

12.1
Re vegetation around existing waterbodies to increase biodiversity value and water quality.

12.2
Upgrade riparian vegetation through planting infill to increase biodiversity value

12.3
WSUD, treating water from storm water pipes before returning in to the creek.

12.4
Create a buffer of planting and swale along creek edge to filter golf course water run-off.

12.5
Enhance vegetation buffer within internal golf course to increase biodiversity value.

12.6
Enhance vegetation buffer between southern edge of golf course and adjacent property boundary.

12.7
Potential future land manipulation to create offline water storage to help decrease flood risk.

12.8
Enhance vegetation buffer between southern edge of golf course and adjacent property boundary.

Malvern Valley Golf Course
Markham Avenue Reserve
Gardiners Creek Trail
Gardiners Creek (Wooyong Nooit)
Victory Blvd
City of Boroondara
The Blvd
Monash Freeway
Holmesglen Institute
Thurso St
Wavelly Rd

OPPORTUNITIES & PRIORITIES

General
- Stonnington LGA
- Contour line
- Structure above
- LXRA Area of works

Walls + Edges
- Battered edge
- Concrete terrace

Pavements
- Gardiners Creek Trail (Existing-New/Upgrade)
- Discovery trail (Existing-New/Upgrade)
- Adventure trail. gravel (Existing-New/Upgrade)
- Adventure trail. boardwalk (Existing-New/Upgrade)
- Special slow zone
- Roads & carparks
- Flexi zones
- Enhanced path connection

Architecture + Site Structures
- Existing building
- Building
- Bridges
- Underpass

Water Elements
- Waterbodies
- Wetlands existing
- Wetlands
- WSUD swale

Furniture + Fittings
- Toilets
- Drinking Fountains
- Stopping point
- Enhanced park entry
- Decision point

Planting
- Lawn
- Sports lawn
- Native grassland/gardenbed

Trees
- Existing permeable trees
- Vegetation Enhanced
- Proposed permeabl trees

0 20 60 m

13.1
Upgrade riparian vegetation through planting infill to increase biodiversity value.

13.2
Install new signage and way finding at key junctions, aiding in navigation to major local & regional destinations.

13.3
Potential future land manipulation to create offline water storage to help decrease flood risk.

13.4
Enhance vegetation buffer between golf course and Warrigal Road to reduce visual impact of busy urban road.

13.5
Upgrade cycle and pedestrian route from Holmsglen Train Station to Gardiners Creek Trail.

13.6
Enhance vegetation buffer between southern edge of golf course and adjacent property boundary.

13.7
Enhance vegetation buffer within internal golf course to increase biodiversity value.

13.8
Install new signage and way finding at key junction, informing the community of the Gardiners Creek Corridor.

City of Whitehorse
Power Ave
Victory Blvd
Warrigal Rd
City of Monash
City of Boroondara
Gardiners Creek (KooyongKoot)
Gardiners Creek Trail
Monash Freeway
Malvern Valley Golf Course
Holmesglen Station
The Blvd
Holmesglen Institute
Betesford Rd

MCGREGOR COXALL

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MASTERPLAN STRATEGIES

3.0 Masterplan Strategies

3.1. Lighting

A lighting suite and scheme should be developed across the corridor length to ensure consistency of approach and to ensure Council and community needs are understood and met. Lighting design is to reference the Council's Urban Lighting Guidelines (e.g. smart lighting on timers, avoid lighting in biodiversity sensitive areas).

With all lighting, environmental impacts needs to be taken into careful consideration. A darkness strategy should be utilised in the majority of the corridor ensuring light pollution is minimised for environmental, ecological and experiential benefits.

A suite and hierarchy of energy efficient LED lights, should be used only through key areas of the corridor. Four levels of lighting are proposed to enhance community use of open space, safety, accessibility and define the unique character while mitigating environmental impacts on biodiversity:

1. Gardiners Creek Trail

Gardiners Creek Trail should be illuminated pole mounted LED lights to guide users along the path and reinforce its hierarchy as the main trail along the corridor. At path intersections and main intersections lighting should be provided to ensure visibility of users. The development of lighting should be considered throughout the whole corridor, working with adjacent councils to ensure a consistent design language is used when moving between council areas along the trail.

2. Corridor destinations

Destination points along the corridor, where evening use is encouraged, sufficient lighting should be provided to enable safe use of spaces. These include key pavilions and community meeting points.

Car parks should also be lit where necessary, in particular when co-located with corridor destinations.

3. Key Connections

For navigation from park entries to corridor destinations, and between destinations, lighting should provide a level of visual comfort and safety.

4. Feature lighting

Utilised for art and interpretation, feature lighting should enliven otherwise dull spaces (for example the underpass of CityLink toll road), that are heavily used in the evening.

Lighting precedents

Slimline, elegant and unobtrusive design that allow the landscape to be the hero.

Slender bollard lighting for key linkages

Tall pole-mounted lights for vehicle zones & park destinations

In-ground path lighting

Light as art

3.2. Materials & Furniture

Materials

A simple, elegant palette of materials in natural hues should be chosen to complement, not compete, with the surrounding landscape. Materials should be robust, high quality and durable.

A materials palette for Gardiners Creek Corridor could include:

- Recycled plastic in muted colours.
- Hardwood Australian Timber, ethically sourced, natural finish allowing weathering
- Black powder coated mild steel
- Concrete
- Asphalt with concrete kerbs (for SUP trails only)

Furniture & Structures

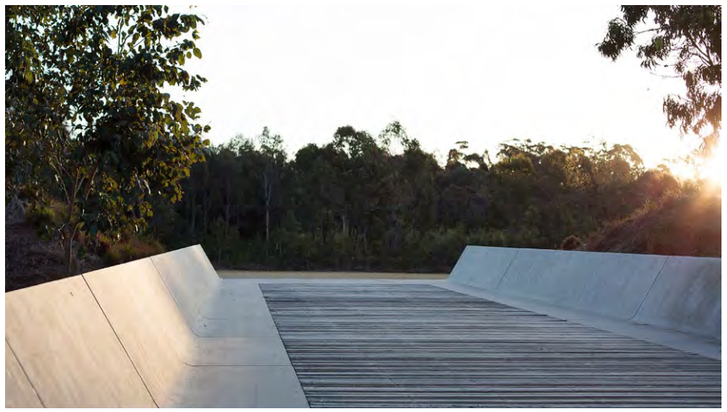
A suite of furniture and structures (such as shade and barbecue pavilions) should be developed and deployed along the length of the creek utilising the project material palette. They should be high quality examples of multifunctional infrastructure, weaving together physical, natural and cultural elements into a coherent and integrated whole.

Guidelines for the development of furniture and material selection include:

- Strive to deliver higher than best practice sustainability outcomes.
- Utilise recycled materials where possible, particularly including any onsite material.
- Work with Traditional Owners to ensure cultural values are protected, appropriately acknowledged, interpreted and celebrated.
- Where possible and appropriate design should provide for all abilities.
- Consider the life-cycle maintenance, repair and replacement costs of assets in the context of the City of Stonnington.
- Material selection should place priority on life cycle cost over up-front costs, with consideration given to required maintenance.
- All buildings and associated structures to be constructed to the highest possible environmental standards in accordance with the Green Star Rating system, reflecting their context within a creek corridor setting.
- Infrastructure design to reflect its natural landscape and cultural setting.

Materials & Furniture precedents

Subdued, robust materials and design that allow the landscape to be the hero.



3.3. Wayfinding & Signage

A wayfinding strategy and palette should be developed and deployed across Gardiners Creek corridor, signifying entries, routes, destinations within the corridor and key surrounding destinations outside of the corridor. The wayfinding will also help to define a sense of place and identity for the park, drawing from the rich history & stories. Wayfinding and directional signage should be kept at a minimum and consolidated where possible to ensure minimal clutter in the corridor.

A suite of wayfinding elements needs to be developed to cater for the hierarchy of wayfinding typologies, with all wayfinding and signage to align with IMAP Wayfinding Signage manual 'Wayfound Victoria V2.0'. The suite is to utilise consistent materials, design language and branding strategy that is sympathetic to the creek corridor environment. Wayfinding and signage should be considered throughout the whole corridor, working with adjacent councils to ensure a consistent design language is used when moving between council areas. Below are two signage categories. Wayfinding signage assists users in navigating. Interpretation signage assists in telling the stories of the site, including traditional owner stories, history, cultural and natural values:

1. Wayfinding typologies

- Gateway entrance – Showing that people are entering or leaving Stonnington.
- Park Identification – Located at park entries, which includes maps.
- Map directional signage – Located at key nodes and decision making points. Map signage could also provide information such as suggested walking itineraries, route notes, distances and average walking times between key destinations.
- Trail directional signage – Located at intersection of paths
- Trail markings – To distinguish different trail typologies
- Destination directional signage – Located where necessary to direct to key nodes and destinations such as pavilions and train stations.

Wayfinding for high-speed users needs to be legible for users when:

- Travelling at high speeds
- Viewing from a distance
- Needing to make quick directional decisions

2. Interpretation signage typologies

- Large Interpretation signage – Located at attractions. Interpretive signage can be used as tools for education, and should appeal to a wide range of ages and interests.
- Small Interpretation signage – Located along paths providing information on the not-so-obvious attractions of the corridor.
- Interpretation integrated within built form, as creative elements within the landscape.

Wayfinding precedents

Consistent and clean wayfinding high-lighting key local and regional destinations and linkages.

Cycling signage suite - TFL Cycle Superhighways, London UK

A wayfinding suite - Cotter Dam Discovery Trail, ACT

Interpretation precedents

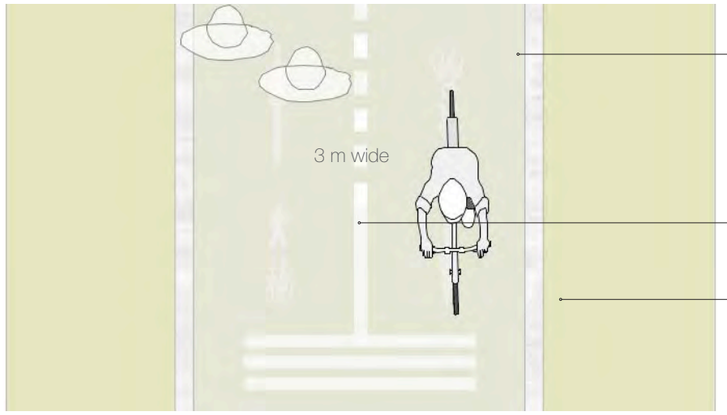
Interpretive/educational signage integrated with structures, furniture and paving.

3.4. Path Typologies

Different trail typologies will provide a hierarchy and network of paths catering to different user and environmental needs, these include:

1. Gardiners Creek Trail (shared user path)
   - Designated Gardiners Creek Trail highlight via signage - Commuter preferred.
2. General Access Path (shared user path)
   - An alternative shared-user path route to the Gardiners Creek Trail.
3. Adventure Trails
   - 3.a. Gravel
   - 3.b. Boardwalk

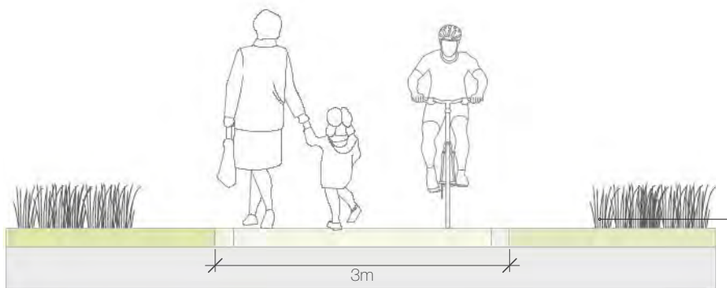
1. GARDINERS CREEK TRAIL



A 3m shared user path is provided at a minimum and where there is minimal space to expand.

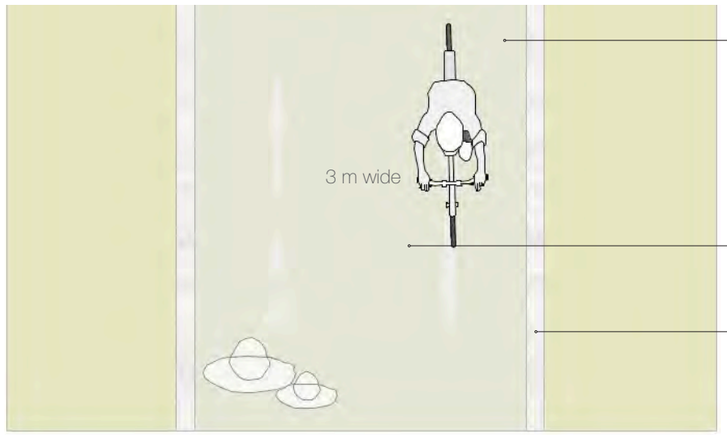
Asphalt path with white line marking and with concrete kerb

Pole mounted LED Wide Distribution lighting. Lights utilised to distinguish path typologies and aid wayfinding in low light levels.



500mm buffer of mulch to minimise maintenance

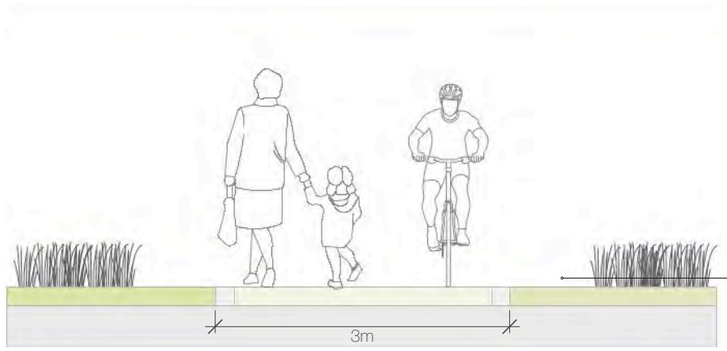
2. GENERAL ACCESS PATH (SHARED USER PATH)



A 3m shared user path that provides an alternate route for those seeking to engage with the creek corridor. The General Access Path takes people off the main Gardiners Creek Trail to aid in the separation of high-speed cyclists and other users.

Asphalt path with white line marking and with concrete kerb

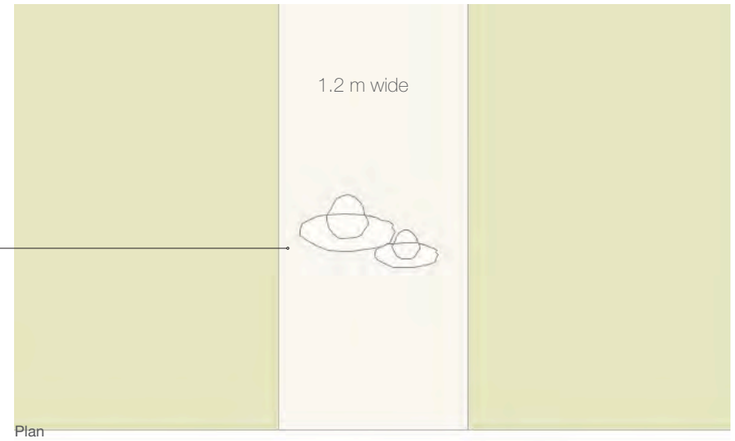
Pole mounted LED Wide Distribution lighting. Lights utilised to distinguish path typologies and aid wayfinding in low light levels.



500mm buffer of mulch to minimise maintenance

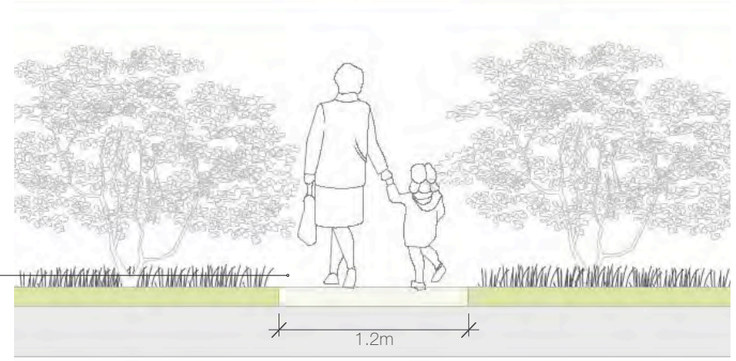
3. ADVENTURE TRAILS

1.2 m off-track adventure trail encouraging users to meander and explore beyond the beaten track



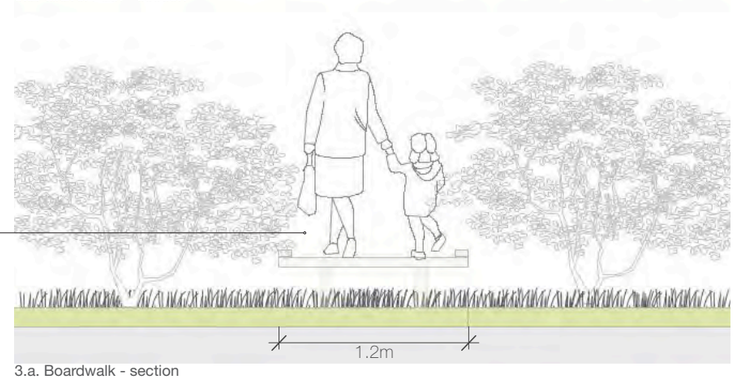
Plan

Gravel track enabling water permeability and visually recessive



3.a. Gravel Path - section

Raised boardwalk (i.e. timber or steel) for ecologically sensitive areas or areas subject to frequent flooding or bogs.



3.a. Boardwalk - section

TRAIL EXPERIENCES

Provide dense buffer vegetation to sound walls while enabling views on opposite side of path.

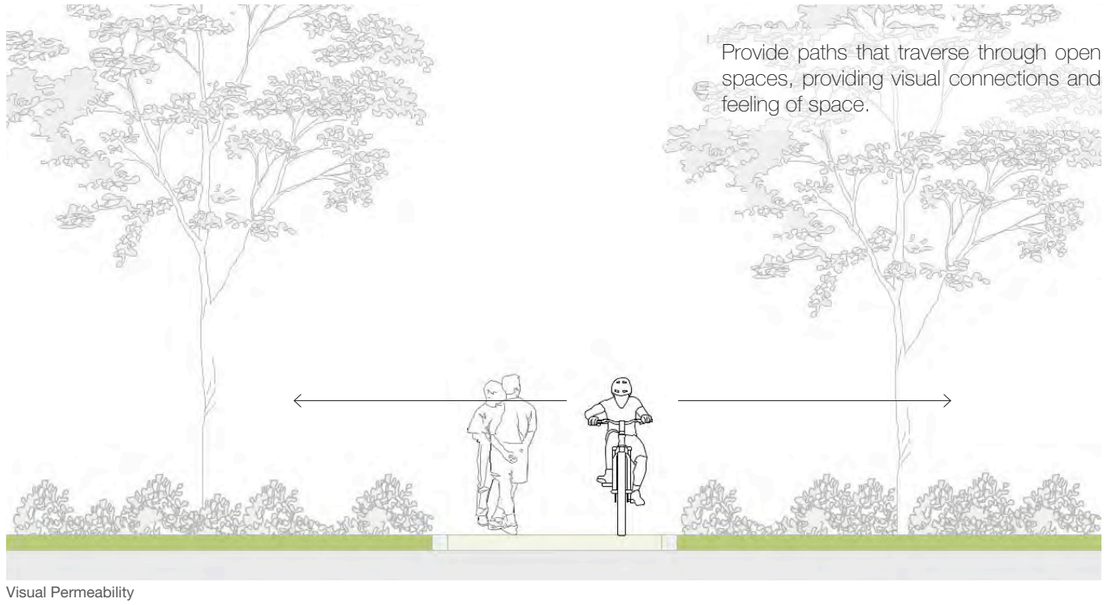
Infrastructure buffer

Provide paths away from Gardiners Creek Trail that enable visitors to traverse through vegetation.

Enclosed buffer

On the Gardiners Creek Trail ensure at least one side of the path has visual permeability for safety and enabling visual connections to surrounds, including the creek.

Buffer / Visual Permeability

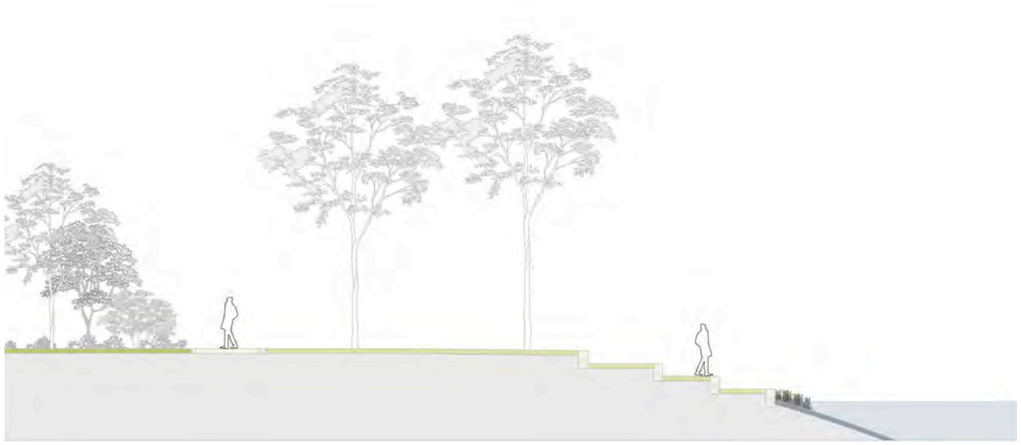


Provide paths that traverse through open spaces, providing visual connections and feeling of space.

Visual Permeability

3.5. Open space Experiences

Provide access to the creek, encouraging interaction and engagement



Terrace creek access

Form landform buffers between sporting ovals and Gardiners Creek Trail where space permits to increase path safety while providing and area for passive recreation and spectators. Berms to be coordinated with sporting clubs.

Landform active buffer

Provide areas of respite along the Gardiners Creek Trail with a focus on the waterway.

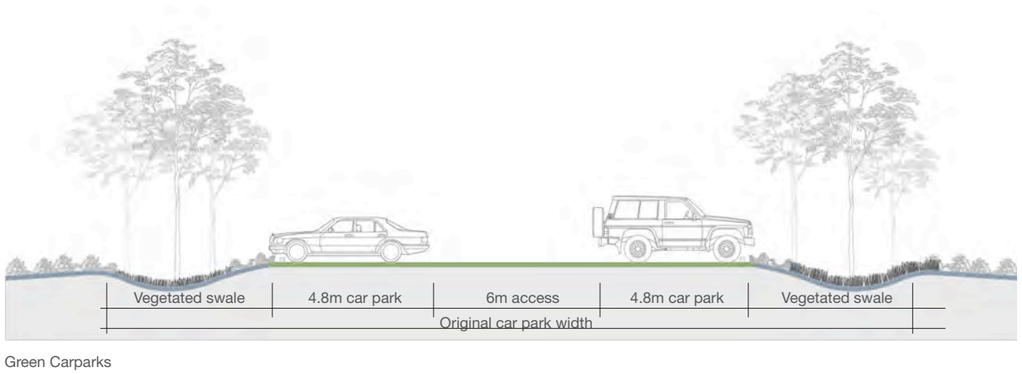
Visual access platforms

Enable visual permeability and connection to the creek at key and frequent intervals to provide the user connection to the waterway

Vegetation Permeability

SMALL SCALE ENVIRONMENTAL WINS

Redesign car parks to reduce width and utilise space for WSUD initiatives.



Green Carparks

Provide vegetation buffer in areas of high ecological or habitat value

Vegetation Buffer

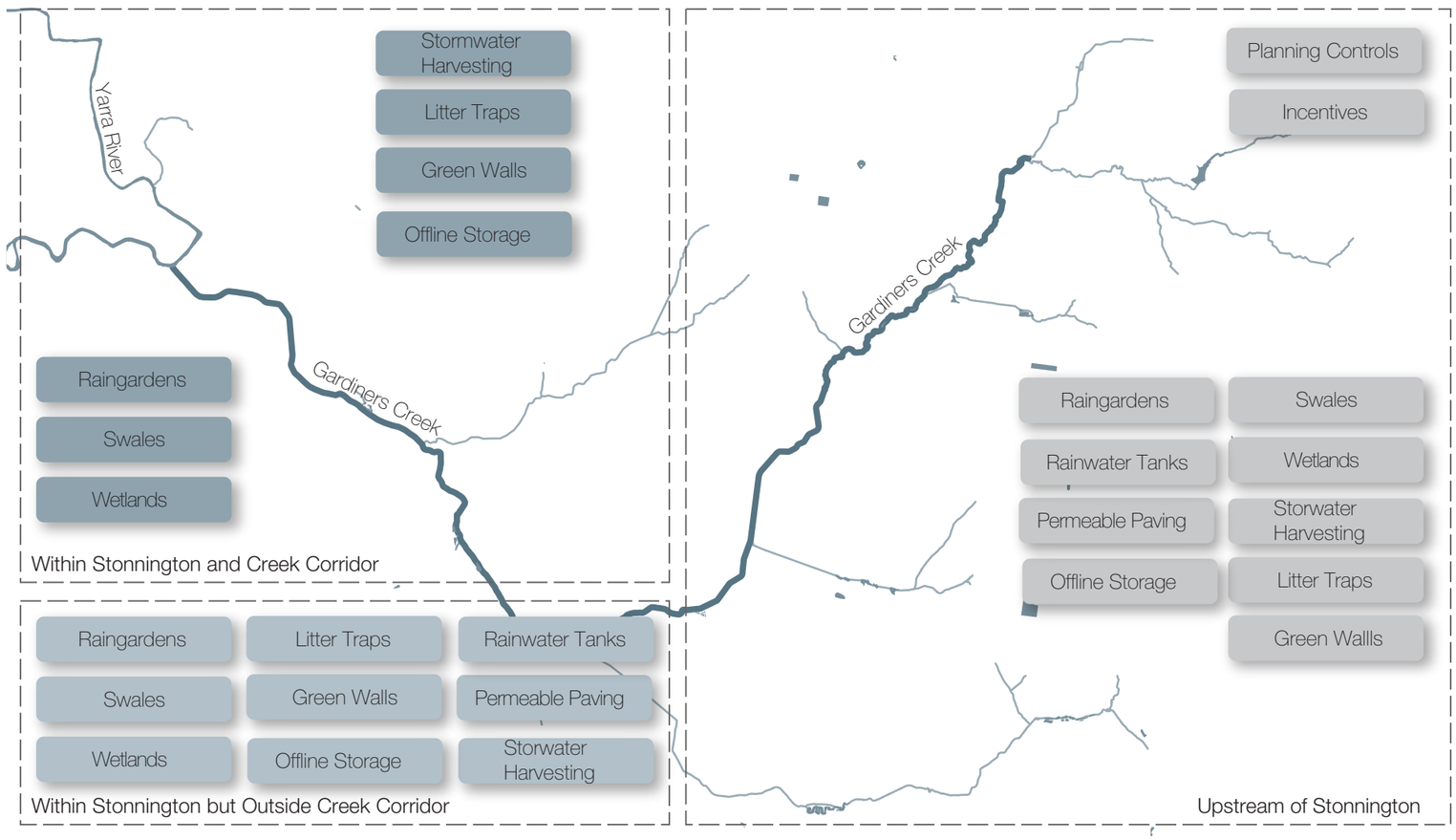
Utilise 'leftover' and under-utilised areas for rich, layered biodiversity.

Bound revegetation

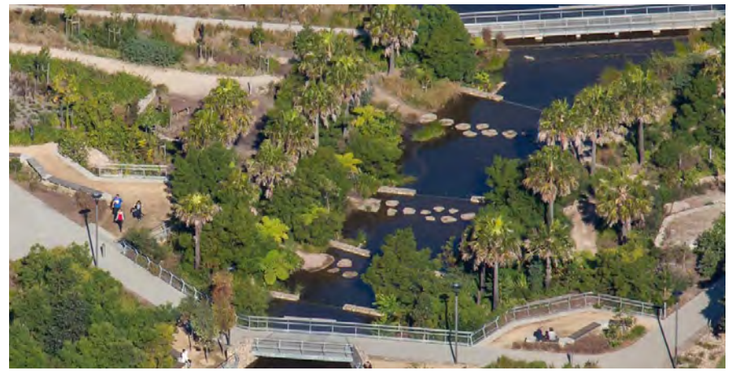
3.6. The Water Tool Kit

Every council across greater Melbourne has a range of options available to them to reduce the stormwater volumes and pollutants from entering urban waterways.

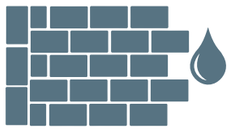
The figure adjacent outlines the main interventions available within the corridor and upstream (on within City of Stonnington and other councils).



Water Tool Kit Deployment Diagram



TOOLKIT OF WSUD OPTIONS WITHIN THE CORRIDOR

	1. SWALES	2. RAINGARDENS	3. WETLANDS	4. HARVESTING	5. PERMEABLE PAVING	6. LITTER TRAPS	7. VERTICAL WSUD TREATMENT	8. OFFLINE STORAGES
ICON								
DESCRIPTION	Swales adjacent to bike and walking paths and as a substitute to underground stormwater drains are a simple but effective way to retain water in the landscape and filter stormwater entering the creek corridor. Swales are typically 3 metres in width and 0.5 metres deep, and suitable for any grade up to 10%, but can be designed with just a 0.5 metre width if necessary (and if there is a relatively small inflow through the asset). Swales are typically planted with ground cover, with trees planted adjacent to the asset.	Small contained raingardens (technically known as bioretention systems) are a good solution to filter a specific impervious area of catchment and can be located in depressions within the landscape. They should be located above the floodplain to avoid flooding, which affects the maintenance of the asset. The assets are designed to capture sediment, nutrients and litter from upstream urban areas, and will increase the contribution of filtered cleaner stormwater entering Gardiners Creek (KooyongKoot).	Wetlands are designed to reduce stormwater pollution and sediment from affecting waterways and bays. They are larger assets (i.e. typically take up at least 1000 square metres) and typically are designed to divert medium flows from an urban catchment (low flows remain in the drain to support flows in dry weather, and high flows must bypass the asset, or they will scour the asset and reduce its life span). Glen Iris wetland is an example of an existing wetland within the creek corridor. Wetlands are great biodiversity and amenity assets, and when combined with a storage pond can also support a reduce in flow volumes into the creek.	Stormwater harvesting involves the collection, filtering and reuse of stormwater from roofs and roads in an urban catchment. Reuse of this water is usually focused on replacing potable water used for irrigation of reserves and sporting ovals. These assets are designed to capture and reuse millions of litres of water, and hence can be seen as valuable in reducing Council's potable water consumption.	Permeable paving is paving that allows water to permeate through (or around) pavers. The term is used to refer to either one continuous layer of asphalt or paving that is permeable, or a series of pavers that allows water to infiltrate in between the pavers through a sand grouting. This type of asset dramatically reduces the volume and velocity of water that flows off a previously impervious surface, and instead encourages water to infiltrate into groundwater. Permeable paving can have where necessary sand based media layers and underground aggie pipes to drain the infiltrated water to a drainage pit or the creek. This technique has been used in Europe extensively, and also in virtually all capital cities in Australia. This type of solution can be used in roads, car parks, and footpaths.	A litter trap is designed to capture coarse gross pollutants that flow from urban environments. Gross pollutants includes both organic (i.e. leaves, sticks, branches, seeds, and mulch type material) and inorganic (i.e. cans, bottles, cigarette butts, plastic wrappers, shopping trolleys). These assets require regular maintenance as they generally fill up after one large rainfall event. There are different types of litter traps (metal grates, wire baskets, and larger civil infrastructure known as gross pollutant traps that attempt to capture litter from a drain). The key benefit from these types of assets is that they improve the aesthetics of the immediate area downstream. They can be used as educational prompts as well, by highlighting the volume and type of litter that is coming from poor behaviour upstream of the asset (usually in shopping strips, car parks and schools).	Much of Gardiners Creek (KooyongKoot) is under or just next to the Monash Freeway. This freeway drains into Gardiners Creek (KooyongKoot), and presents an opportunity, depending on the specific nature of the existing infrastructure and drainage pipes, to intercept this runoff and treat it and support a green wall or green façade on a pillar or other structure – before draining into the creek. These green assets would create a more vibrant and dynamic environment, while reducing the pollutants from a large tollway entering the creek.	Flood management and flash flood events are a major issue in all urban catchments in Australia. There are two (structural) solutions to reducing the impact of this type of flooding in urban areas: detention at source, or detention basins within the creek system (with off stream storages preferable). In a natural setting this is the function that billabongs and floodplains serve. In an urban environment we require 'sponge wetlands' or 'floodplain storages' to influence and reduce the severity of flooding. In Gardiners Creek (KooyongKoot), an urban catchment of 112 km2, a possibility exists to retain flood water through a redesign of upstream areas including golf courses and parks, to create a 20 to 40 hectare basin that would also act as a major biodiversity, stormwater harvesting and urban refuge space within the middle of the catchment.

	1. SWALES	2. RAINGARDENS	3. WETLANDS	4. HARVESTING	5. PERMEABLE PAVING	6. LITTER TRAPS	7. VERTICAL WSUD TREATMENT	8. OFFLINE STORAGES
BENEFITS								
WQ	Yes	Yes	Yes	Yes	Yes	x	Yes	x
LITTER	Yes	Yes	Yes		Yes	Yes	Yes	x
GREENERY	Yes	Yes	Yes	Yes	x	x	Yes	Yes
URBAN HEAT	Yes	Yes	Yes	Yes	x	x	Yes	x
WATER SAVING				Yes	x	x	x	x
FLOOD MITIGATION	Small events only	Small events only	Yes	Yes	x	x	x	Yes
CONSTRAINTS	Available space	Available space. Depth / other services	Available space and maintenance access	Available space, cost and proximity to water demands	In house knowledge regarding maintenance	Maintenance, cost, and size of pipes.	Available space and maintenance	Available space and competition for other uses

OFFSTREAM DETENTION

The upstream offline storage option could create detention of anywhere from 50,000 m3 to 200,000 m3 of space to retain flood waters that flow from the upstream urban areas of Gardiners Creek (KooyongKoot). A reshaped golf course could act as a wetland, storage and harvesting system and iconic piece of green infrastructure in the middle of this urban catchment.

Other retarding basins like this in the city include Lewis Park (Knox) and Jacana Wetland (Moreland).

The benefits of this type of option are that it could:

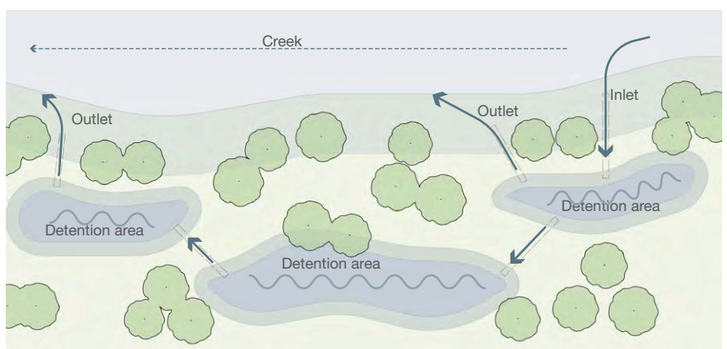
- Reduce peak floods, in minor to major flooding
- It is ideally placed in the middle of the catchment
- It captures flows from Scotchman's Creek
- It would reduce the impact of flooding (ie litter and erosion) on the lower section of Gardiners Creek (KooyongKoot) and reduce maintenance costs
- Provide urban cooling to the area
- Add to the biodiversity value of the area, and potentially connect with the Glen Iris Wetlands

To effectively manage flooding and improve the quality of the Gardiners Creek (KooyongKoot), this option alone would not be enough, and a catchment wide solution is required with buy in from all councils and Melbourne.

The concept itself is to create an off stream flow path, and a series of different depressions and different depths in a large open environment like the golf course.

Utilise offline water storage to treat and slow the volume of water eantering the creek.

Cross section

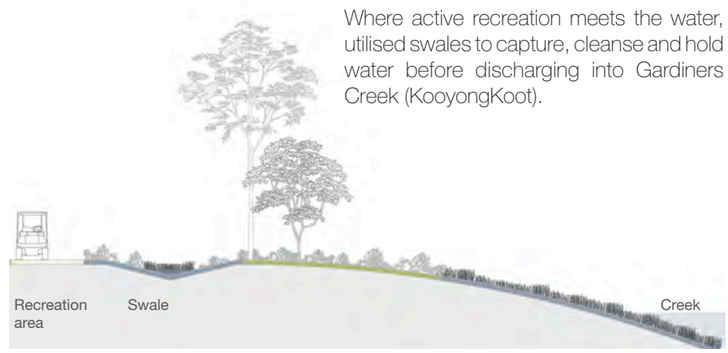


Plan View

Utilise cut an fill to create water detention volumes and mounding at golf course for safe pedestrian passage.

Recreation & storage link

Where active recreation meets the water, utilised swales to capture, cleanse and hold water before discharging into Gardiners Creek (KooyongKoot).



Recreation & treatment link

PLANTING STRATEGY

WEED TREATMENT

Prior to the commencement of any revegetation or regeneration works there are a number of weed species that should be treated to ensure the future success and integrity of the site.

At a minimum all Noxious weeds and Environmental Weeds, those declared under the Catchment and Land Protection Act 1994 (CaLP Act) and those listed as Weeds of National Significance (WoNS), should be treated as part of an integrated weed management plan.

Furthermore, in the absence of any real list of Environmental weeds supplied by the City of Stonnington for their LGA, it would be beneficial to include those "very high-risk weeds" listed by the Arthur Rylah Institutes Report for DEWLP, Advisory list of environmental weeds in Victoria (2018). As such replacement of a number of the existing European species across the site should be included as part of an ongoing management plan.

The weed score for each of the zones previously calculated during the habitat assessment is not necessarily indicative of the presence or absence of the weeds mentioned below, as the habitat value was calculated using a suite of weed species that threaten that particular vegetation community. It should be noted that the successful eradication of the noxious and listed weed species will require ongoing management, over the course of a number of years.

Scientific Name	Common Name	Risk Rating	Weeds of National	Victorian CALP Act
Anredera cordifolia	Madeira Vine	High Risk	YES	YES
Chrysanthemoides monilifera subsp. rotundata	Bitou Bush	Very High Risk	YES	
Genista monspessulana	Montpellier Broom	Very High Risk	YES	YES
Lycium ferocissimum	African Box-thorn	High Risk	YES	YES
Rubus anglocandicans	Common Blackberry	High Risk	YES	YES
Rosa rubiginosa	Sweet Briar	High Risk		YES
Salix sp.	Grey Sallow	Very High Risk	YES	YES
Ulex europaeus	Gorse	High Risk	YES	YES

Source: Advisory list of environmental weeds in Victoria, Arthur Rylah Institute (2018), note Juncus acutus was not included in the source list, though it was found on site (Zone 3) and is listed as noxious in Victoria

Scientific Name	Common Name	Risk Rating
Cotoneaster sp.	Velvet Cotoneaster	Very High Risk
Hedera helix	English Ivy	Very High Risk
Lonicera japonica	Japanese Honeysuckle	Very High Risk
Olea europaea subsp. europaea	Common Olive	Very High Risk
Ilex aquifolium	English Holly	Very High Risk
Ligustrum lucidum	Large-leaved Privet	Very High Risk
Ranunculus repens	Creeping Buttercup	Very High Risk
Typha sp.	Lesser Reed-mace	Very High Risk
Coprosma repens	Mirror Bush	Very High Risk
Holcus mollis	Creeping Fog	Very High Risk
Fraxinus angustifolia subsp. angustifolia	Desert Ash	Very High Risk
Cenchrus clandestinus	Kikuyu	Very High Risk
Delairea odorata	Ivy Groundsel	Very High Risk
Ehrharta erecta	Panic Veldt-grass	Very High Risk
Tradescantia fluminensis	Wandering Creeper	Very High Risk

In conjunction with an integrated management plan to address the weeds listed above each of the zone will require a different method for restoration of the vegetation community. Using the results from the initial assessment of the site along with the Conceptual model of ecosystem degradation and restoration from the National Standards for the Practice of Ecological Restoration in Australia (SER, 2018) each of the zones could be realistically divided into two categories, those requiring reconstruction or assisted regeneration. Each of these zones was further prioritised taking into account the existing habitat values, current level of weeds that would further affect its viability and functionality, the level of effort required and its proximity within the landscape to areas of pre-existing vegetation.

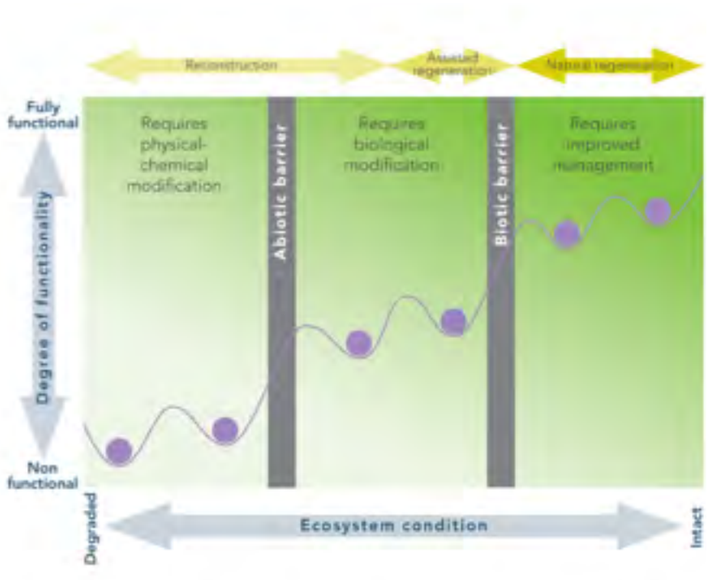


Figure 1 Conceptual model of ecosystem degradation and restoration. (Adapted from Keenleyside et al 2012, after Whisenant 1999, and Hobbs & Harris 2001). The troughs in the diagram represent basins of stability in which an ecosystem can remain in a steady state prior to being shifted by a restoration or a degradation event past a threshold (represented by peaks in the diagram) towards a higher functioning state or a lower functioning state. [Note: Not all sites in need of physical/chemical amendment depend upon reintroduction for the return of biota—e.g. if colonisation potential in that ecosystem is high.]

Source: National standards for the practice of ecological restoration in Australia (SER 2018)

ZONE RESTORATION

SUMMARY

In regards to ecological restoration works using the Conceptual model of ecosystem degradation and restoration from the National Standards for the Practice of Ecological Restoration in Australia (SER, 2018) the site could be divided into two categories, those requiring "reconstruction" and "assisted regeneration". Two existing vegetation communities (EVC 55 and 56) and the existing wetland areas would fall into the category of areas requiring assisted regeneration whilst a number of areas that have the potential to connect the site which are currently lacking any real vegetation communities could benefit from complete reconstruction.

Zone	Restoration	Habitat Score	Weeds*
Zone 1	Reconstruction	17%	0
Zone 2	Assisted Regeneration	28%	2
Zone 3	Assisted Regeneration	40%	13
Zone 5	Reconstruction	16%	0
Zone 6a	Assisted Regeneration	53%	13
Zone 6b	Assisted Regeneration	44%	11
Zone 7	Assisted Regeneration	49%	11
Zone 8	Assisted Regeneration and Reconstruction	37%	7
Zone 9	The Forest Fairway - Grassy Plain Woodland	27%	7
	Floodplain Riparian Woodland	16%	0

*Weeds => this is a score out of 15 where 0 signifies high coverage of significant weeds and 15 is effectively weed-free.

ZONE 1: THE UNDERPASS

Although the habitat value of this zone is higher than zone 5, the species palette that could be used would be limited by the height of the elevated motorway above and as such would have minimal value as an extension of the riparian corridor, it would still have to rely on the existing native and weedy vegetation that currently performs this function on either side of the aerial road way. The value of reconstructing a modified EVC, in this case suitable rainforest species from the Dandenong Ranges, for the community and users of the area may be found to out way the lack of habitat value.

ZONE 2: THE SPORTING EXPANSE

Although the works required here would be substantial, given the presence of existing canopy and the councils reluctance to remove the existing European trees, the restoration works to be undertaken would comprise of Assisted Regeneration in the short term. Ideally any long-term management of this area would include the gradual replacement of the European trees with suitable native trees indicative of the EVC. Any works undertaken within this area would provide an ideal opportunity to increase the habitat value of the creek line as well as the intrinsic value for the residents and community that frequent the park.

ZONE 3: THE LOCAL HIDEAWAY ; ZONE 6: BIODIVERSITY COLLECTOR ; ZONE 7: THE URBAN CLEANSER

The priority of works required for Zones 6a and 3 are based on the best management practices for restoration works, being works should move from areas that are primarily of better value to those of lesser, in this case the difference between all of them is based primarily on the similarity of the zones to the predetermined EVC. All of them have signs of current and/or past works being undertaken by either Council contractors and/or volunteer friends' groups. Assisted Regeneration in the form of supplementary planting with species indicative of the EVCs along with an ongoing integrated weed management plan would allow for a large increase in the value of the zones with minimal input.

ZONE 5: THE NARROW CONNECTOR

As previously noted much of the area below the footpath is highly degraded, with minimal habitat value and high levels of weeds. By managing the weed levels within the native existing vegetation above the foot path coupled with supplementary planting and reconstruction of the vegetation community below the path would greatly increase the habitat value of this area. Given its proximity to the confluence of Gardiners Creek (KooyongKoot) and Back Creek any works undertaken here would only serve to further increase the habitat value of the areas adjacent, and subsequently all of those to zone 8. Rehabilitating this area first would result in the greatest increase in habitat value and would result in a single, large cohesive patch extending from Burke Rd through to the golf course and including Back Creek.

ZONE 8: THE OPEN ACTIVATOR

Although there are similarities in zone 8 to Zones 6, 7 and 3 above that could benefit from Assisted regeneration, there are still areas through Zone 8 that could benefit from reconstruction. Given the amount of effort required along with the value at which it was previously assessed the priority level for this zone was lower than those mentioned above.

ZONE 9: THE FOREST FAIRWAY

Plains Grassy Woodland (EVC 55):

As noted above much of this area has a well if not excessive canopy cover (> than EVC benchmark), therefore much of the works would comprise of re-establishing a more cohesive understory and mid story. There is some areas such as the south western corner of the site that could benefit from some increased canopy cover. The removal of weeds and reestablishment of other life forms other than the canopy would provide an easily achievable increase in the habitat value of the area. Given that the majority of this vegetation community exists between the golf course and the motor way it could serve as a refuge and a continuous potential corridor for species that might not benefit from so much pubic interference, in particular domestic dogs.

Floodplain Riparian Woodland (EVC 56):

Much of this area, looks to have had very little input, although there are a few patches of assisted revegetation and areas marked for future works (Melbourne water). As noted above there is an established canopy across much of the site which is close to that of the benchmark, however this is comprised of primarily younger native trees and weed species. Given the lack of previous work within this area compared to the EVC 55 area, the effort of restoring the vegetation community would be more intensive. By removing weedy tree species with successional planting of native stock along with the enhancement of other life forms within this area would greatly increase its habitat score. Given the proximity of much of this vegetation community to that of the wetlands, any enhancement of its habitat value would positively affect the greater Gardiners creek area as a whole.

Existing Wetland:

Given the current state of the wetlands that exist across the site, with a change in the current management practices and some enhancement planting and weed control, there could be a major increase in habitat value with minimal effort. Although the EVC 56 area is currently in a poor state, it still functions as a riparian corridor, the wetlands in turn would provide a vital function for a number of amphibious fauna that use the corridor for foraging and/or habitat during migration.

Areas Requiring Reconstruction:

Across the site there are a number of areas that if revegetated could function as vital corridors between the existing EVCs mentioned above, the existing wetlands and the Gardiners creek riparian corridor as a whole. Many of them are the disused areas adjacent to the fairways, the swales and wet areas, where either weeds exist or the grass struggles to grow. One such area being the small wet soak either side of the footpath leading from the station and the two swales that connect it to the culvert under the Monash fwy and to the Gardiners creek corridor. Such reconstruction works would require restricted access to members during establishment periods. The planting palette to be used across such areas could incorporate a combination of the two EVCs as well as a number of other similar EVCs as well as aquatic and semi aquatic plants. Given their proximity to the fairways small shrubby material would be ideal, as it would enhance areas were tree canopy exists as well as reducing the height to allow play to occur over the top of it where a swale might bisect a fairway.

PLANTING PALETTES

A selection of 7 planting palettes are proposed to be utilised along the length of the creek corridor. They are:

- Terrestrial
- Rainforest
- Semi-aquatic
- Plains Grassy Woodland (EVC 55)
- Floodplain Riparian Woodland (EVC 56)
- Zone 9 Existing Wetlands
- Zone 9 Areas Requiring Reconstruction

TERRESTRIAL

* For areas requiring planing that enable visual permeability, do not use species falling under the categories of Large Shrubs or Medium Shrubs.

			EVC			
			53	55	56	641
		Trees				
		Eucalyptus camaldulensis		x	x	x
		Eucalyptus ovata			x	
		Leptospermum lanigerum	x			
		Melaleuca ericifolia	x			x
		Shrubs				
		Acacia implexa			x	
*	Large	*Allocasuarina littoralis*		x		
		Acacia mearnsii		x		x
		Acacia melanoxylon		x	x	
		Bursaria spinosa			x	x
		Callistemon sieberi				x
		Coprosma quadrifida	x			
*	Medium	*Kunzea ericoides*		x		
		Leptospermum continentale	x			
		Melicytus dentatus			x	x
		Ozthamnus ferrugineus				
		Pimelea humilis		x		
	Small	*Bossiaea prostrata*		x		
		Rubus parvifolius				x
		Herbs				
	Large	*Senecio quadridentatus*			x	
		Senecio minimus				x
	Mediur	*Wahlenbergia graciliis*				x
		Acaena novae-zealandiae			x	x
		Hydrocotyle hirta			x	
	Small	*Veronica plebeia*			x	
		Dichondra repens		x	x	x
		Tufted Gramanoids				
	Large	*Austrostipa rudis*		x		
		Poa labillardierei	x		x	x
	Mediun	*Lachnagrostis filfiformis*				x
		Lomandra filiformis		x		
		Themeda triandra		x		
		Non-tufted gramanoids				
	Medium	*Microlaena stipoides*		x	x	
		Climbers and scramblers				

RAINFOREST

		EVC 29	EVC 30	EVC 31
Trees				
Trees	*Acacia melanoxylon*			x
Trees	*Nothofagus sp.*			x
Shrubs				
Large	*Acacia dealbata*	x	x	
Large	*Pomaderris aspera*	x	x	
Large	*Cassinia aculeata*	x		
Medium	*Coprosma quadrifida*	x	x	x
Medium	*Goodenia ovata*	x		
Medium	*Olearia lirata*	x		
Medium	*Polyscias sambucifolia*		x	
Small	*Platylobium formosum*	x		
Herbs				
Medium Large	*Sambucus gaudichaudiana*		x	x
Medium Large	*Gonocarpus humilis*	x		
Medium Large	*Hydrocotyle hirta*	x	x	x
Medium Large	*Viola hederacea*	x	x	x
Tufted Gramanoids				
Large	*Lepidosperma elatius*	x	x	
Medium	*Dianella tasmanica*	x		
Non-tufted gramanoids				
Medium	*Microlaena stipoides*	x		
Ferns				
Ground	Blechnum wattsii	x	x	x
Tree	Dicksonia antarctica	x	x	x
Climbers and scramblers				
Scrambler	*Clematis aristata*	x	x	x

SEMI-AQUATIC

		EVC 53	EVC 55	EVC 56
Herbs				
Large	*Lycopus autralis*	x		
Large	*Persicaria praetermissa*	x		
Large	*Persicaria subsessilis*			x
Medium	*Myriophyllum crispatum*			
Medium	*Mentha australis*			
Small	*Crassula hemsii*	x		
Tufted Gramanoids				
Large	*Carex appressa*			x
Large	*Juncus procerus*	x		
Large	*Poa labillardierei*	x		x
Medium	*Carex breviculmis*		x	
Medium	*Cyperus spp.*			
Medium	*Juncus amabilis*			x
Medium	*Juncus gregiflorus*	x		
Medium	*Triglochin procerum*	x		
Non-tufted gramanoids				
Medium Large	*Baumea rubiginosa*	x		
Medium Large	*Gahnia sieberiana*	x	x	
Medium Large	*Phragmites australis*	x		x
Medium	*Eleocharis acuta*	x		x

PLAINS GRASSY WOODLAND (EVC 55)

Trees	
	Eucalyptus camaldulensis
Shrubs	
Large	*Allocasuarina littoralis*
	Acacia mearnsii
	Acacia melanoxylon
Medium	*Kunzea ericoides*
Small	*Pimelea humilis*
	Bossiaea prostrata
Herbs	
Small	*Dichondra repens*
Tufted Gramanoids	
Large	*Austrostipa rudis*
Medium	*Lomandra filiformis*
	Themeda triandra
Non-tufted gramanoids	
Medium	*Microlaena stipoides*

FLOODPLAIN RIPARIAN WOODLAND (EVC 56)

Trees	
	Eucalyptus camaldulensis
	Eucalyptus ovata
	Eucalyptus tereticornis spp. Mediana
Shrubs	
Large	*Acacia implexa*
	Acacia melanoxylon
Medium	*Bursaria spinosa*
	Melicytus dentatus
Herbs	
Large	*Senecio quadridentatus*
	Acaena novae-zealandiae
Medium	*Hydrocotyle hirta*
	Veronica plebeia
Small	*Dichondra repens*
Tufted Gramanoids	
	Poa labillardierei
Non-tufted gramanoids	
Medium	*Microlaena stipoides*
Climbers and scramblers	
Scrambler	*Calystegia sepium*

ZONE 9 EXISTING WETLAND

Herbs	
Large	*Lycopus autralis*
	Persicaria praetermissa
	Persicaria subsessilis
	Myriophyllum crispatum
Medium	*Mentha australis*
Small	*Crassula hemsii*
Tufted Gramanoids	
Large	*Carex appressa*
	Juncus procerus
	Poa labillardierei
	Carex breviculmis
	Cyperus spp.
Medium	*Juncus amabilis*
	Juncus gregiflorus
	Triglochin procerum
Non-tufted gramanoids	
Large	*Baumea rubiginosa*
	Gahnia radula
	Phragmites australis
Medium	*Eleocharis acuta*

ZONE 9 AREAS REQUIRING RECONSTRUCTION

	Shrubs
	Bursaria spinosa
	Callistemon sieberi
	Coprosma quadrifida
Medium	*Kunzea ericoides*
	Leptospermum continentale
	Melicytus dentatus
	Ozthamnus ferrugineus
	Pimelea humilis
Small	*Bossiaea prostrata*
	Rubus parvifolius
	Herbs
	Senecio quadridentatus
Large	*Senecio minimus*
	Wahlenbergia graciliis
	Acaena novae-zealandiae
Medium	*Hydrocotyle hirta*
	Veronica plebeia
Small	*Dichondra repens*
	Tufted Gramanoids
Large	*Austrostipa rudis*
	Poa labillardierei
	Lachnagrostis filfiformis
Medium	*Lomandra filiformis*
	Themeda triandra
	Non-tufted gramanoids
Medium	*Microlaena stipoides*
	Climbers and scramblers
Scrambler	*Calystegia sepium*

City of
STONNINGTON

GARDINERS CREEK (KOOYONGKOOT)

MASTERPLAN APPENDIX

MCGREGOR
COXALL

Project Client: STONNINGTON CITY COUNCIL
Project Name: GARDINERS CREEK MASTERPLAN
Project Number: 0738MEL

Revision:	Status:	Date:	by:	Checked:
A	Masterplan	27.08.20	RL	MW/PC

Studio: Melbourne
Report Contact: Miranda Wilkinson
Consultants: Wave Consulting/ Zinc Cost Management/ Australian Ecosystems

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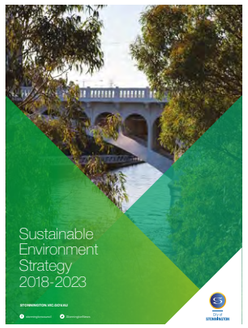
Disclaimer

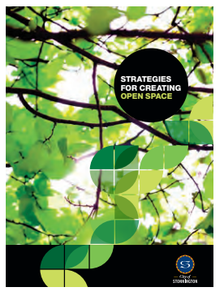
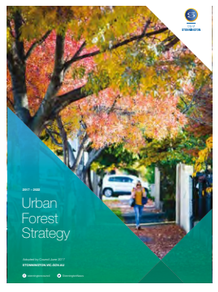
Contents

1.0 Appendix

1.1. Key Document Summaries

Below is a list of City of Stonnington documents, highlighting a snapshot of their vision, relevance and key points against the masterplan's key drivers.

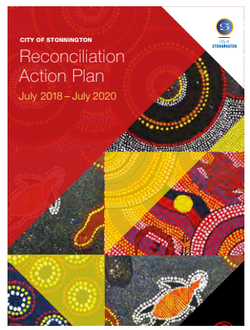
STRATEGIES & PLANS	VISION SNAPSHOT	ACCESS & CONNECTIVITY	BIODIVERSITY & WATER	OPEN SPACE - PASSIVE & ACTIVE RECREATION	CULTURAL VALUES
SUSTAINABLE ENVIRONMENT STRATEGY 2018-2023 	*"Sustainable city".*	• Supporting greener vehicles and more sustainable transport options. • Improving walking and cycling infrastructure, promoting public transport options and facilitating car sharing within the municipality. • Support the uptake of electric and low emission vehicles.	• Improve and maintain waterway conditions for environmental, social, cultural and economic values. • Integrating water sensitive urban design treatments throughout the municipality and growing the urban forest to ensure a cool, healthy and liveable city. • Protect and enhance the natural environment, acknowledging that a healthy environment supports a healthy community. • Improving water use efficiency. • Investment in infrastructure to intercept and treat water as it moves through the catchment. • Weed removal, bank stabilisation and planting indigenous plants with an aim to increase habitat connectivity, improve water quality and provide recreational and educational opportunities for the community. • Indigenous and drought tolerant exotic species. • New and diverse habitat types, such as green roofs and walls. • Capture and manage water for public use of maintenance of high-quality public parks. • Grow the urban forest by planting 250,000 plants and trees throughout the municipality over the next five years.	• Challenges associated with a growing population and an increasingly urbanised environment, and need to provide sufficient & quality open space.	• Increasing community awareness around correct waste management practices and the environmental impact of waste disposal.

STRATEGIES & PLANS	VISION SNAPSHOT	ACCESS & CONNECTIVITY	BIODIVERSITY & WATER	OPEN SPACE - PASSIVE & ACTIVE RECREATION	CULTURAL VALUES
EAGA BIODIVERSITY MONITORING FRAMEWORK 2015 	*"guide and identify opportunities for biodiversity monitoring"*		• Provide mitigation to external factors such as fire, pollution, rubbish dumping, water quality, connectivity, patch size and feral animals. • Diverse indigenous habitat, including native flora and fauna. • Increased or sustained species numbers • Habitat connectivity. • Consider urban and suburban backyards and street trees contribution to connectivity for some species. • Increase revegetation efforts to areas identified as requiring greater connectivity	• Reduced weed cover. • Consider the impact of human disturbances and activities on native flora and fauna.	• Provide for school environmental education programs. • Provide information to residents about native ecologies through various methods (including signage, websites, booklets etc.). • Consider the role communities can play in restoring and monitoring the local flora and fauna.
STRATEGIES FOR OPEN SPACE (2013) 	*"Public space is a highly valued as a community in Stonnington'*	• Improve accessibility to existing open space and recreational reserves. • Encouraging access to the existing under-utilised open space. • Landscape and access to Gardiners Creek can continue to be improved. • Improve the safety and accessibility of bike and shared paths.		• Provide additional open space within the municipality. • Investigate the feasibility of under grounding, or decking activity centre 'at grade car parks' to provide additional open space. • Develop streets as linear forms of open space. • Council currently has an open space reserve fund of $28.115m for the purchase of open space. • High priorities exist to expand existing open space and paths using VicTrack land in Malvern East.	• Encourage the implementation of green roofs & walls as both public and private open space across the municipality, in particular in areas of increased density.
URBAN FOREST STRATEGY 2017-2022 	*"A healthy, resilient, diverse and valued urban forest"*		• Support biodiversity and a healthy environment. • Help to encourage the planting and maintenance of vegetation on private land and regulate vegetation removal through the planning process. • Explore innovative solutions to plant canopy trees in dense urban environments. • Trees enhance the quality and usability of these areas and help to provide a connection to nature. • Develop unique, attractive and distinguishing avenues of feature trees • Target tree planting in low canopy cover areas to help mitigate the effects of the urban heat island.	• Use trees in the reduction and mitigation of urban heat island effect. • Identify opportunities to increase the number of trees in parks.	• Council runs many workshops and events through its annual calendar of environmental events. This includes Spring into Gardening, community and school planting days and gardening workshops. • Work with residents and owners in relation to proposed new planting initiatives. • Implement annual tree planting programs in key biodiversity sites.

STRATEGIES & PLANS	VISION SNAPSHOT	ACCESS & CONNECTIVITY	BIODIVERSITY & WATER	OPEN SPACE - PASSIVE & ACTIVE RECREATION	CULTURAL VALUES
STONNINGTON CYCLE STRATEGY 2013 - 2018  	*"Cycling will be widely undertaken in Stonnington, whether for fun, fitness or travel"*	• Encourage MetroTrains to explore the need and opportunity for the installation of long-stay bicycle parking facilities at all rail stations in Stonnington. • Investigate providing parking for cyclists at all appropriate Council events. • Investigate opportunities to provide and enhance safe cycling options on select Council- responsible roads. • Install bicycle parking facilities, with a particular focus on activity centres, leisure and recreation facilities and other key activity/ congregation points. • Trial the installation of a bicycle corral facility. • The main type of crash for serious injuries was when a cyclist turned right into the path of an oncoming vehicle. This was followed by motorists opening car doors into the path of an oncoming cyclist. • Support bicycle journeys to local rail stations. • Undertake improvements to off-road shared trails (such as line marking, solar lighting, path widening, signage) • The width of some streets is not sufficient to cater to the range of uses they attract which can create congestion between users. There are also some streets that are sufficiently wide enough to accommodate specialised bicycle provision. • Provision for cyclists at intersections could be improved • 40 km/h speed limits help protect cyclists and other vulnerable road users			• Increase rates of cycling participation. • There is an opportunity to improve the way-finding.

STRATEGIES & PLANS	VISION SNAPSHOT	ACCESS & CONNECTIVITY	BIODIVERSITY & WATER	OPEN SPACE - PASSIVE & ACTIVE RECREATION	CULTURAL VALUES
HEALTHY WATERWAYS STRATEGY - YARRA Note: As Gardiners Creek is a tributary of the Birrarung (Yarra River), this document provides information for Gardiners Creek.  	*NA*	• Increase access to and along waterways from 73% to 75% (about 1km of paths) by filling gaps and improving connections with existing path network.	• Identify and implement opportunities to reduce the key threat of flow stress on waterways by addressing causal factors such as water for domestic and stock uses, climate change, diversions or urbanisation. • Establish a continuous riparian buffer (1km) and maintain existing vegetation (less than 1km, 1ha) along priority reaches (using EVC benchmarks to at least a level 3 vegetation quality). • Identity litter hot spots and build targeted education programs and interpretation infrastructure. Work with councils and volunteer groups. • Develop new landowner waterway information pack with support from council and agencies. • Support large landowners (golf clubs) to develop revegetation programs. Provide seed funding, guidelines and case study examples.		• Increase participation rates from low to height; support community ground and built capacity through citizen science and cultural engagement

STRATEGIES & PLANS	VISION SNAPSHOT	ACCESS & CONNECTIVITY	BIODIVERSITY & WATER	OPEN SPACE - PASSIVE & ACTIVE RECREATION	CULTURAL VALUES
BIODIVERSITY REVIEW OF THE CITY OF STONNINGTON 2007 	*'document significant sites and species and inform the biological values of stonnington'*		All public spaces with significant ecology were studied in the City of Stonnington. Findings included: • Large native trees that are not indigenous to Victoria, sugar gum and lemon scented gum also occur widely over the municipality. • Native and environmentally friendly planting species could be Sea Barry saltbush Atriplex semibaccata. • Avoid isolated planting, particularly in residential or parklands settings such as carparks were single species trees can be disconnected from vegetation communities. • There is noted significant lack of wetlands in the City of Stonnington especially along the natural flood plains of Gardiners Creek. • Major threats to biodiversity in the City of Stonnington are environmental weed invasion's, management of the non-built environment and loss of connectivity. • Site no. 5100, Heyington Railway Station is listed as a biosite. • All sites assessed (except for one) were found to have insufficient indigenous understory to qualify as habitat patches under the Habitat Hectare assessment system. • 15 of the 54 sites the visit and contains no apparently local indigenous plants species but may have included planted native trees and/or shrubs. • Two species of state significance have been recorded in the study area. A patch of seven plants of Pomaderris vacciniifolia was found on the edge of a drainage line in spring scrub near the Glen Iris wetlands. Melbourne Yellow Gum (dhagurn) species name eucalyptus leucoxylon subsp. connata was also recorded.		• Icon species such as the grey-headed flying fox and swift parrot to be used to educate the public about the local ecology and habitats, and wider environmental issues

STRATEGIES & PLANS	VISION SNAPSHOT	ACCESS & CONNECTIVITY	BIODIVERSITY & WATER	OPEN SPACE - PASSIVE & ACTIVE RECREATION	CULTURAL VALUES
RECONCILIATION ACTION PLAN JULY 2018 – JULY 2020 	*Our vision includes a community in which Traditional Owners' connections to the land are respected, where history is taught, and where the diverse cultural backgrounds, experiences and needs of Aboriginal and Torres Strait Islander People living within the City of Stonnington are understood and valued.*			• Investigate the use of Council spaces, events and facilities to support Aboriginal enterprise activities where possible.	• Deliver a minimum of one internal NAIDOC Week event annually • Support community NAIDOC events. • Encourage Aboriginal and Torres Strait Islander staff to participate with their cultures and communities during NAIDOC Week. • Promote and support local community NAIDOC initiatives by supporting schools and community groups to participate through education initiatives such as Koorie Kids art programs. • Investigate a specific training module focused on promoting cultural safety for Aboriginal and Torres Strait Islander children and young People across Council services and programs. • Encourage Staff to include an Acknowledgement of Country at the commencement of all formal meetings. • Include the Acknowledgement of Country at the commencement of important internal and external meetings if a Welcome to Country is not delivered. • Develop, in conjunction with Traditional Owners, a public naming policy, including the consultation process with Traditional Owners for the use of Aboriginal and Torres Strait Islander languages and heritage information.

1.2. Consultation

OVERVIEW

To form an effective masterplan that provides a strong vision for the future of Gardiners Creek, it is essential to incorporate the community, stakeholders and other invested parties into the planning process. The process for this has included meetings and workshops with stakeholders, pop-up events and online engagement to give an ear to a broad cross-section of the community, both existing users and non-users. Feedback has covered, insights and concerns, incorporating the key issues and opportunities. This feedback will continue to inform the development of the masterplan. Consultation undertaken included:

a. Community consultation

- Pop-up Event
- Community workshop
- Intercept surveys
- Online survey & email submissions

b. Stakeholder consultation

- City of Stonnington
- City of Monash
- City of Whitehorse
- Melbourne Water
- City of Boroondara
- Friends of Gardiners Creek Valley
- Department of Transport / VicRoads
- Boon Wurrung Foundation
- Wurundjeri Tribe Land and Compensation Cultural Heritage Council
- Local Sporting Clubs

SUMMARY OF CONSULTATION FEEDBACK

ACCESS AND MOVEMENT

Shared User Path

- There have been incidents of pedestrian/cyclist accidents on Shared User Paths (SUP) and many users requested changes to the shared user path, highlighting its high use, especially during peak hours, the difficulty of sharing cyclists, pedestrians, family and dog walkers, the speed of cyclists, the frequency of bends, the need for improved lighting, signage and seating. Methods suggested to alleviate the issue include:
  - Separation of users (That is cyclists have their own dedicated path, regardless of cyclist speed. Paths needs to be clearly distinguishable to ensure clarity for users. Where the two paths have to be located together, we need to understand if there is sufficient space to cater for both users.);
  - Bike slowing mechanisms;
  - Public education; and
  - There could be a potential to locate paths on different sides of the creek.
- The SUP should be separated from facilities such as playgrounds and dog zones.

Connections

- Safe, legible and easy connections to train stations and other public transport stops is crucial to ensure longer, multi-modal journeys are catered for.
- Connections from the south-side of the motorway to Gardiners Creek Trail are poor, resulting in a disconnect from the Gardiners Creek Trail for the large

Figure 01. - Community pop-up consultation at TH King Reserve

catchment south of the motorway (which is City of Stonnington residents). Ensuring that the commuter/cycle path is highly accessible is crucial to encouraging commuter cyclists. On the same token, other footpath networks need to be easily accessible from both sides of the motorway to encourage use.

Amenities, Crime prevention through environmental design (CPTED) & Lighting

- Visitors highlighted the need for public amenities including clear signage along the path and at key access points. Suggestions were made to provide frequent stopping points for recreational and commuter cyclists as an opportunity to provide better engagement with Gardiners Creek.
- Security, safety and CPTED principles required. Lighting, vegetation setbacks, passive or active surveillance.
- More lighting required in highly used areas.

WATER - CATCHMENT, CONNECTIONS & HEALTH

- The frequency of flooding throughout the extent of Gardiners Creek is seen as an issue. Previous flooding has impacted infrastructure, increased weed infestation, removed or seriously affected young planting, and caused major maintenance problems towards the mouth of the Birrarung (Yarra River).
- Support for rain gardens and increased native planting along waterways.
- Need for a whole of catchment approach to water management to assist in reducing the impact of flooding.
- Reduce litter in the creek is required, but an at-source approach to litter reduction would be preferable.

OPEN SPACE AND PASSIVE / ACTIVE RECREATION

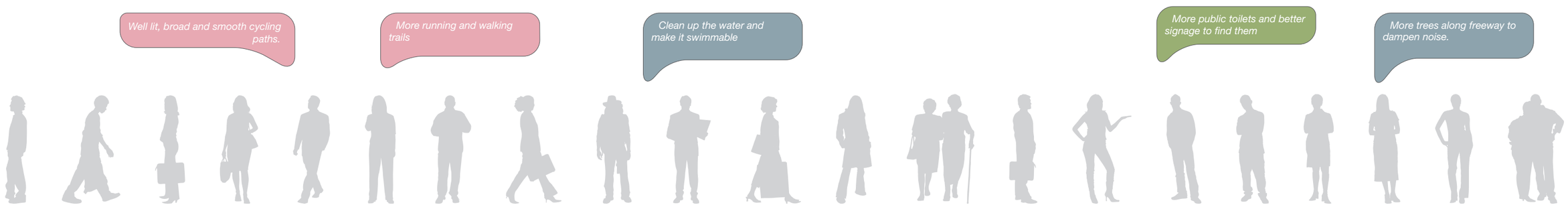
- The community highlighted their love of minimal infrastructure throughout the Gardiners Creek Trail as well as highlighting their love of a highly natural space in an urban setting.
- Difficulty of being able to engage with the water was expressed, suggesting there was also a need for more informal naturalised areas for better engagement with native environments.
- Safety concerns were expressed for the interaction between sporting and recreational uses, highlighting the closeness of the shared user path to sporting fields and facilities. Suggestions for improvement included the use of safety fencing, buffer planting, increased signage and better alignment of pedestrian paths.
- Concerns surrounded the full capacity playing fields, the long-term maintenance of the playing fields, and the restricted amount of parking provided at peak periods.
- Additional issues raised included the lack of lighting, bins, toilets and other facilities. suggestions included an increase in off-lease dog areas, the addition of fitness equipment and the increase in native vegetation.
- There is a need to increase accessibility to council facilities such as toilets and amenities.

BIODIVERSITY

- Support was given for the increase of biodiversity throughout the Gardiners Creek corridor.
- Support for native flora and fauna, including fruiting trees, and the reduction of light pollution.
- It was agreed there is a need for stitching together biodiversity hotspots along and across the creek.

CULTURAL VALUES

- The need to connect the community to their land and be active members in Caring for Country, and understand the Aboriginal Culture as an integral part of the Australian Culture to provide a unified, shared future vision for Australians.
- Utilise education through built and unbuilt forms of Gardiners Creek to share knowledge throughout the community and further generate meaningful engagement with and actively involved Caring for Country.
- Visitors also suggested different types of engagement with the Gardiners Creek Trail including community-run events and education programs or workshops that would teach locals about the vegetation and native flora and fauna of the Gardiners Creek Corridor.
- Explore and promote long-term opportunities for public art integration as a form of cultural knowledge sharing and increased awareness of indigenous culture and shared ownership, including ephemeral art, historic and future



narratives & engagement with Country, and sculpture parks such as Herring Island Sculpture Park.

- The incorporation of indigenous history and stories. The need to tell stories so people understand the significance of the creek, and that it is more than a drainage corridor but a waterway supporting life. The creek has played a different role for different people over thousands of years, these stories need to me told. Making key and significant stories prevalent, including the 'Running of the Eels' event and ceremony.
- Co-locating aboriginal learning with relevant current and proposed uses. For example coupling learning about aboriginal children games with sporting ovals and areas.
- Utilise different senses for story telling, including audio stories (which are currently used on the Birrarung (Yarra River).
- Provide spaces for bushfood areas. These can be areas with signage of bush food, enabling people to then explore the creek corridor and discover these bushfoods elsewhere.
- Connect aboriginal culture into all design and built elements that are implemented as an outcome of this masterplan.
- Develop meaningful places for young people to explore and engage with Country.
- Explore opportunities for events and workshops with the creeks systems, waterways and cultural stories for the community and visitors to further share knowledge and provide greater access to the aboriginal history and culture of the creek and surrounds.
- Recognise and celebrate the cultural diversity of Gardiners Creek and look towards a coexisting future that incorporates and gives space to all indigenous and migrant cultures.
- Explore the opportunity for an indigenous performance and cultural space that is sensitive to Country and allows for the sharing of knowledge in arts, dance, voice, workshops, talk and more.
- Explore the locations of historic waterways and billabongs and reveal them through physical and intangible means to give legacy and understanding to the impact of colonial management and indigenous land.
- Provide long-term engagement with country and culture for community members and visitors through Aboriginal walking tours, welcome & acknowledgement to Country, ceremonies and participation workshops of indigenous culture, artefacts, economics and inventions.
- Develop outdoor 'bush' classrooms for all ages and cultures to share knowledge of Country, environment, history, aboriginal dreaming, spirituality and botany.

GOVERNANCE

- Department of Transport is currently undertaking a 'Strategic Cycling Corridors' document, this looks at creating connection to the priority commuter routes and train stations. Gardiners Creek Trail is considered a Priority Commuter Route by the Department of Transport.
- It is understood that governing bodies such as the Department of Transport and Melbourne Water are responsible for areas within the masterplan zone. Currently there is no commitment or timing associated with works in these areas.

Figure 02. - Community consultation at TH King Design Hub

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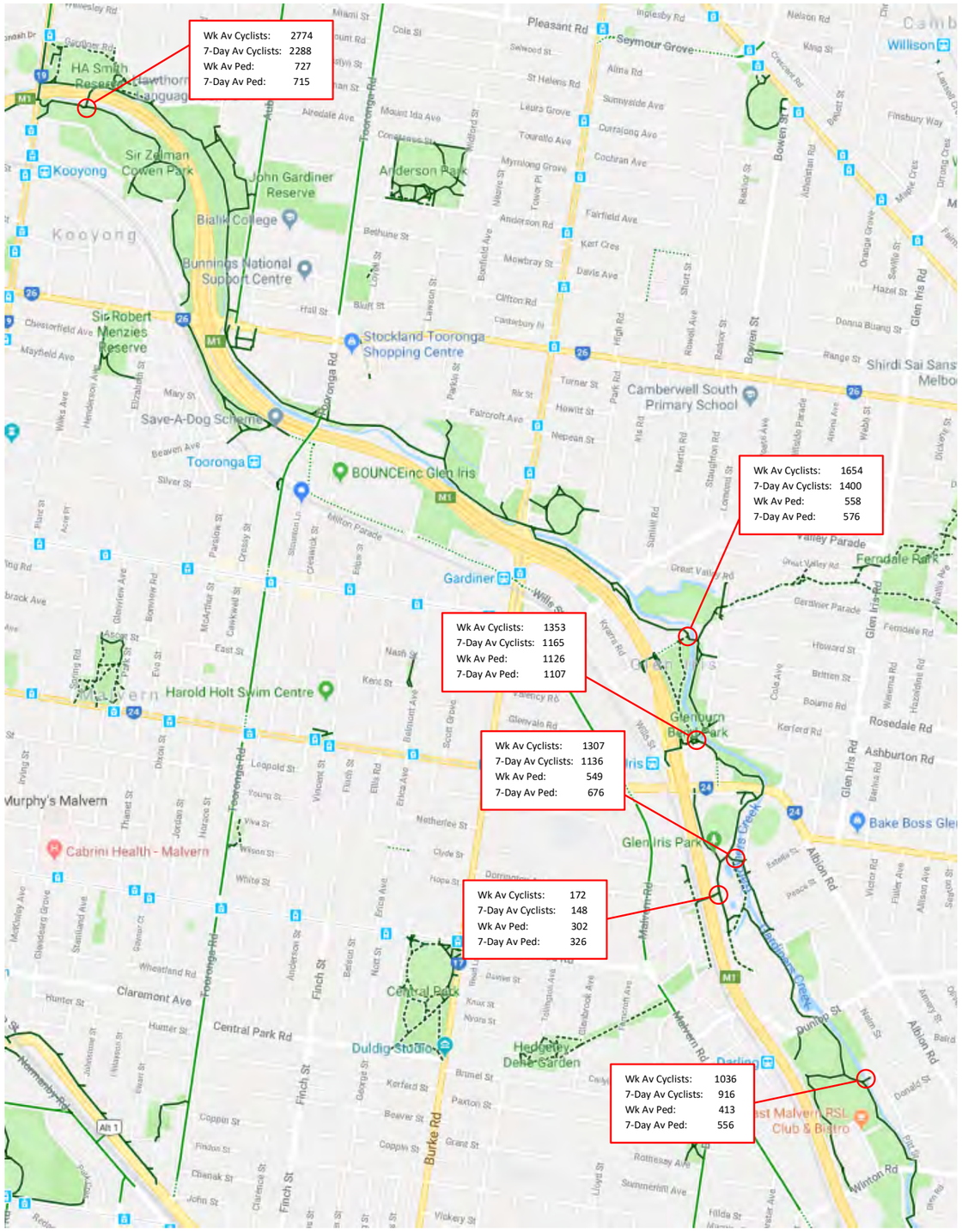
1.3. Stonnington City Council Cycle Counts



MCGREGOR COXALL

Site	M-F Av Cycle	S-S Av Cycle	M-F Av Ped	S-S Av Ped	Analysis – key observations	What this means for Gardiners Creek Masterplan
1 – Zelman Cowan	2774	1072	727	684	• cycle very dominant, commuter pattern • Consistent weekday, Tues PM peak • Ped activity AM/PM commuter peak and significant lunchtime activity • Approx. 4500 total movements on peak day (Tuesday).	• Separate ped/cycle facilities where possible. Safety priority. • Possibly higher cyclists max speed given volume and higher potential for conflict due to volume • Cycle improvement priority • Clear demarcation of routes could assist
2 – Elm Road	1654	765	558	622	• cycle dominant, commuter pattern • Consistent weekday, Tues AM/PM peak • Ped activity peak Monday 8-11AM, volume peak Monday closely followed by Sunday • Tues and Friday other high ped volumes	• Only site ped and cycle peak very close to overlap (Monday AM) • Cyclists stay on main path, so options to make other path more pedestrian-friendly
3 – Brixton Rise	1353	694	1126	1059	• Complex site – 12 path counts. • V high ped activity – roughly equal to cycling • Ped volume high M/Tu/F/Su – affected by weather? • Ped peak 9-11AM weekday – GI train station - students? Later than commuter peak. • Cycling general weekday commuter pattern + Sunday late AM recreational	• High ped activity = investigate and prioritise separation where possible • Consistently high ped volumes associated with train station. Directional peak flow may mean higher demand on link. • Possible jogging loop identified • Alternative route for pedestrians to the main path which could be prioritised with wayfinding?
4 – TH King Res	1307	707	549	994	• Complex site – 12 path counts. • cycle dominant, commuter pattern • Consistent weekday, Mon/Tues AM/PM peak • Ped activity v high Sunday all day, almost 2x next highest day (Sat) • Sunday highest total trips across modes • M/T next highest total volumes • Cycling access movements from Allenby Underpass	• Dominant recreational – higher number of family users (ie small children, bike trailers)? • Pause points, water fountain, stopping space? • Wayfinding more important for weekend and occasional users • Also high number of weekday commuters • Pedestrians more evenly distributed to other paths- pedestrians could be prioritised on these
5 – Allenby Av Underpass	172	88	302	385	• Cycle commuter pattern • Intersection with underpass • Lowest volume site by some margin • Only site higher ped than cyclists • Sunday v dominant ped volume • Ped peaks varied – some commuter pattern wkdy	• Cyclist priority direction is clear • Path south could have surface altered to be more pedestrian friendly (low bicycle use to be encouraged) • Improved wayfinding?
6 – Maxwell St	1036	916	413	556	• Complex site – 12 path counts. • Peds much higher than cyclists Sat/Sun • Sat AM ped peak activity, Sun ped peak volume • Cyclist volumes follow commuter weekday peak. Highest Tues PM peak. Thurs low weekday (could be due to rain)	• High ped activity on weekend and also high cycle activity on Sunday – potential family groups of both. • More points of interest, Seating, pause points? • No need to alter the bridge for cycle access based on counts

1.4. Mapping of location-specific issues & opportunities

ACCESS AND MOVEMENT - ISSUES AND OPPORTUNITIES

MONASH UNDERPASS

Section of suspended SUP, linear corridor with no escape or break points. Advocate for an additional trial.

Explore installation of additional access and resting points.

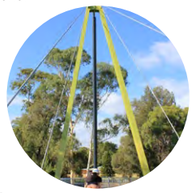
Improve connections to surrounding schools and sports facilities

YARRA BOULEVARD ENTRY

Promote as gateway to Gardiners Creek Trail and the City of Stonnington

GLENFERRIE RD

Investigate the potential for upgrades to cycling routes at street crossings as well as improved wayfinding. Current pedestrian & cyclist conflict zone.



GARDINERS CREEK BRIDGE

The Gardiners Creek Trail moves to the City of Boroondara, consider issues with management and consistent design language.

KOOYONG STATION

Currently no secure bike storage.

Advocate for the installation of long-stay bicycle parking facilities at all rail stations.

CAR PARK

Disconnected shared path trail, interrupted by car park.

Investigate consolidation of car park and conversion into flexible space for alternative uses.

ELIZABETH ST

Identify opportunities and diversified facilities including bike parking, lighting, shade, signage.

TOORAK ROAD

LXRP opportunity to enhance connectivity across Toorak Rd.

TOORONGA PARK

Poor quality surface, with unsatisfactory connection to adjacent train station.

TOORONGA CROSSING

Unsatisfying connectivity across major roads and onto the Gardiners Creek Trail.

STOPPING POINTS

Narrow section of SUP doesn't invite uses to stop and engage with the landscape.

BURKE RD

Endo fo trail. Improve on road cycle path connection via line marking and wayfinding.

CONNECTIONS
Potential to connect pedestrians and cyclists across Gardiners Creek & Back Creek

HIGH STREET BRIDGE
Improve quality and safety of underpass through general upgrade, including lighting.

GLEN IRIS STATION
Support bicycle journeys to local rail stations.

PATH ALIGNMENT
Sharp corners intersect with narrow bridges, investigate opportunity to reduce risks.

HIGH ST TRAM STOP
Increase access from local transportation hubs.

MONASH FREEWAY UNDERPASS
Improve quality and safety of underpass through general upgrade, including lighting.

DARLING PARK OVERPASS
Car park currently at full capacity and poorly connected to surrounding pedestrian network.

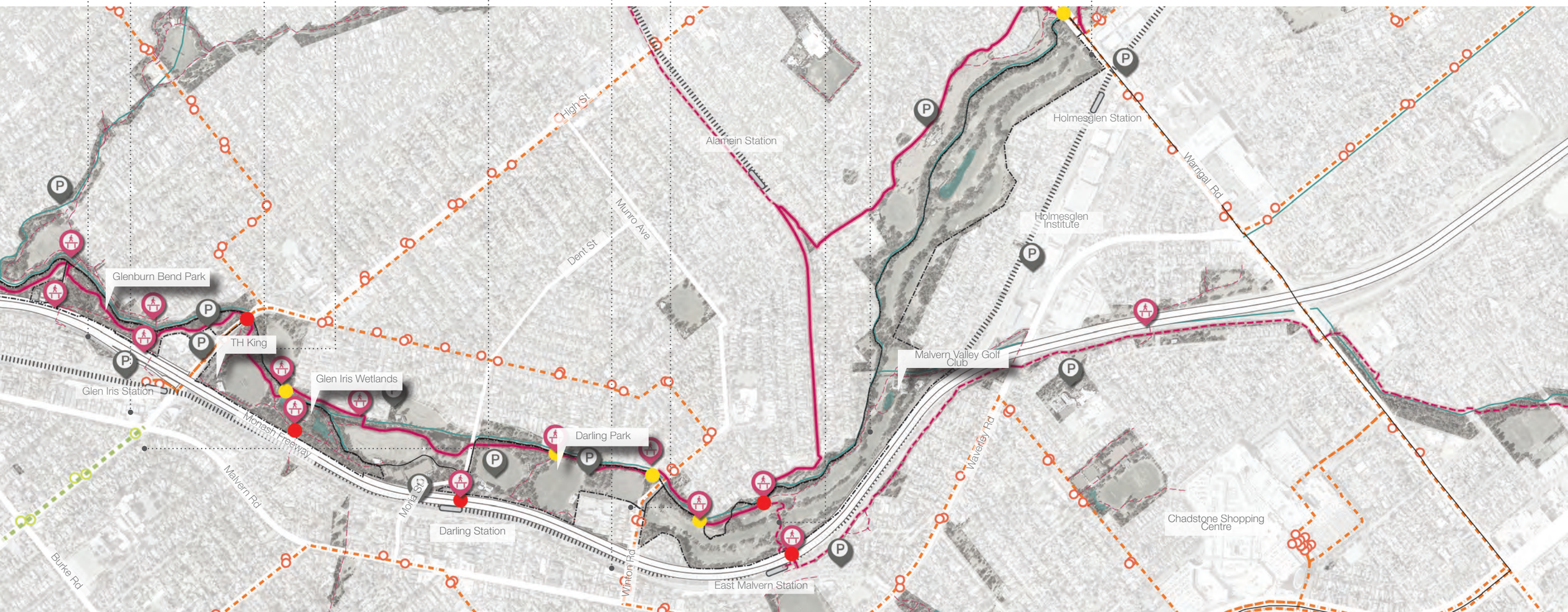
GARDINERS CREEK TRAIL
Corners of bridges are tight, resulting in limited sight lines causing risk between path users.

MALVERN VALLEY GOLF CLUB
Conflict between path users and golfers with danger of been getting hit by balls.

WARRIGAL ROAD CONNECTION
Current poor pedestrian and cycling connection between Holmsglen Station and Gardiners Creek Trail.

- Site Extent
- Watercourse
- Waterbodies
- Gardiners Creek
- Open Space
- Power Lines
- Monash Freeway
- Roads
- Gardiners Creek Trail
- Capital City trail
- Regional Cycle Trails
- Train Line
- Train Station
- Tram Lines
- Tram Stop
- Bus Line
- Bus Stop
- Pedestrian Bridge/Tunnel
- Parking
- Narrow Access
- High Conflict Areas

0 100 200 300 400 m



WATER - ISSUES AND OPPORTUNITIES

CONCRETE CANAL

Identify opportunities to naturalise sections of concrete lined canal.

INFRASTRUCTURE ACCESS

All infrastructure access points must be retained. Restricts available area for future project implementation.

MONASH FREEWAY

Identity litter hot spots and build targeted education programs and interception infrastructure. Work with councils and volunteer groups.

FLOODING

Low lying land at the mouth of Gardiners Creek prone to large flooding events.

OVERPASS

Removed access and connection to waterway when travelling along the elevated SUP.

WATER INFRASTRUCTURE

Access to canal and water deterred.

Opportunity for Activation of existing water infrastructure.

PARK FACILITIES

Park facilities capture and store rain water.

Opportunity to expand number and capacity to enable use during periods of low rainfall.

TOORONGA PARK

Currently storm water discharges into park, inundating SUP.

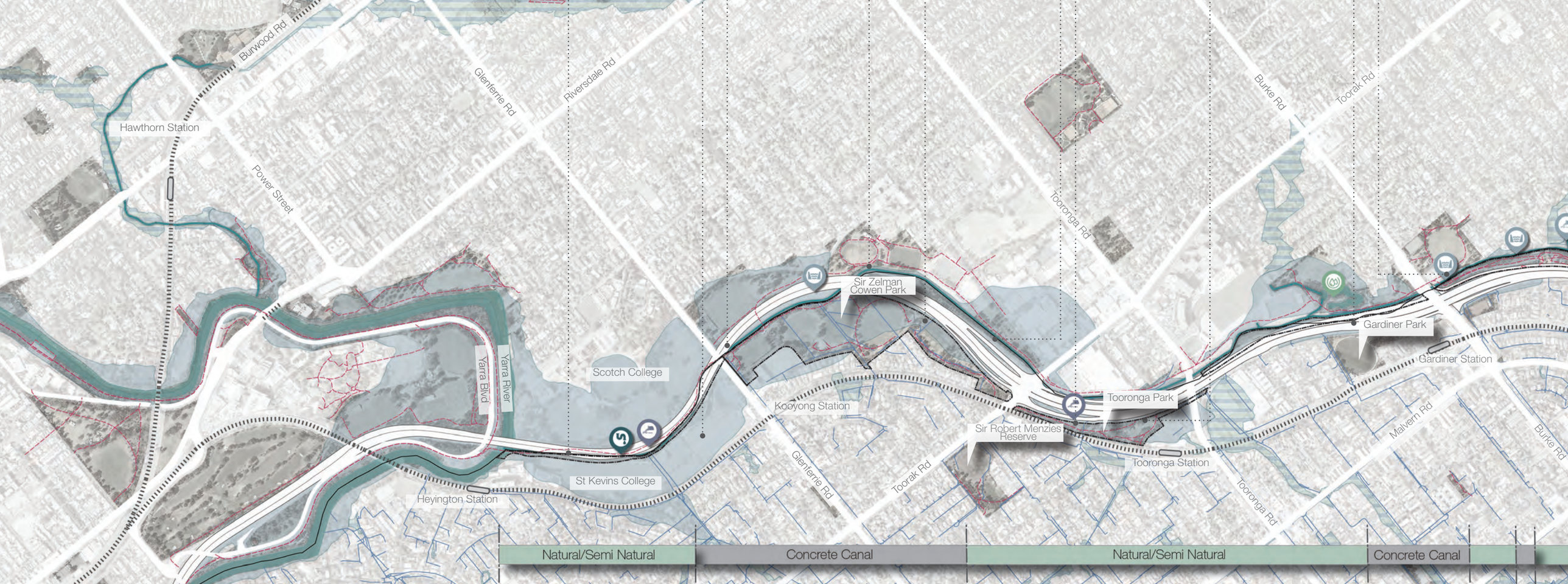
TOORONGA PARK

Park is a retarding basin, that floods on a regular basis

Investigate opportunities to celebrate and naturalise water infrastructure.

CONCRETE CANAL

Explore potential to daylight concrete canal into natural creek



WATER QUALITY

Water quality throughout creek is low due to runoff from highly urbanised catchment.

Promote catchment wide WSUD to improve water quality.

TH KING

Low bank levels allow close access and connection to water.

Opportunity to enhance connectivity to water.

VEGETATION

Lush vegetated creek bank character.

CREEK WEIRS

Historic weirs.

Celebrate weirs, increasing access and visibility.

SCOTCHMANS CREEK

Creek outlet carries large volumes of water during flood occurrences increasing pressure on Gardiners Creek capacity.

WATER INFRASTRUCTURE

Opportunity to integrate water infrastructure into the landscape through landscape based systems.

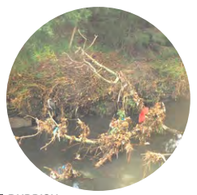
GLENBURN PARK

Unstable banks erode during periods of high water.

GLEN IRIS WETLANDS

Wetlands act as treatment and storage systems improving the quality.

Opportunity to expand wetlands throughout other locations.



RUBBISH

Rubbish swept into the creek via stormwater pollutes the creek.

Investigate the future roll of gross pollutant traps.

CREEK BANKS

Steep creek banks decreases ability to access the creek.

SEWAGE OVERFLOWS

Melbourne Waters sewage overflow points.

Potentially causing pollution and water quality risks for down steam areas.

MALVERN VALLEY GOLF COURSE

Investigate opportunities to create offline water storage to slow/ capture and store water during high volume periods.

Site Extent
Watercourse
Waterbodies
Gardiners Creek
Open Space
Power Lines
Monash Freeway
Roads
Path Network
Train Line
Train Station
Land Subject to Inundation (MW)
Special Building Overlay
Stormwater Drains
WSUD Treatment
Water Infrastructure
Storm Water Discharge
Sewage Discharge points

0 100 200 300 400 m

Back Creek
Glenburn Bend Park
TH King
Glen Iris Wetlands
Glen Iris Station
Monash Freeway
High St
Malvern Rd
Darling Park
Darling Station
Monte St
Winton Rd
Dent St
Munro Ave
High St
Alamein Station
Holmesglen Station
Holmesglen Institute
Warrigal Rd
Malvern Valley Golf Club
Waverley Rd
Chadstone Shopping Centre

Natural/Semi Natural

OPEN SPACE - ISSUES AND OPPORTUNITIES

FREEWAY UNDERPASS

Minimal access to open space/natural assets. Adjacent open space is privatised.

DOG WALKERS

Large number of dog walkers throughout the parks.

Occasional conflicts with other path & park users

SIR ZELMAN COWEN PARK

Regional scale playground planned in Sir Zelman Cowen Park.

TOORAK ROAD

Opportunity for upgraded amenities through LXRP level crossing removal strategies.

SPORTS GROUNDS

All sports grounds are currently at capacity.

TOORONGA PARK

Tranquil parkland. Disused play facilities and uninviting playground. Opportunity for upgrade in association with WSUD.

GARDINER PARK

Isolated and disconnected open space.

Opportunity for land acquisition for access from train stations and to Gardiners Creek Trail.

GARDINERS CREEK

Improve open space quality along narrow sections.

GLENBURN PARK
Opportunity to engage with adjacent commercial zone.

BRIXTON RISE
Opportunity to encourage business and residents to connect with open space

MUSWELL BEND
Opportunity to improve connectivity and amenities for passive and active recreation.

TH KING PAVILION
Popular spot for picnics for locals and families. Facilities are limited.

Opportunity to explore options to cater for growing demand.

TH KING PARK
Shared path is in close proximity to adjacent sports field creating conflict between users.

DARLING PARK
Facilities located in beautiful spot. Opportunity to upgrade facility to adapt to increase demand and diversity of use.

MALVERN VALLEY GOLF CLUB
Opportunity to improve integration of protective fencing.

MALVERN VALLEY GOLF CLUB
Opportunity to infill and enhance existing internal vegetation. Buffer vegetation around inactive boarders.

EXISTING WATERBODIES
Opportunity to extend planting and biodiversity value around existing features. Consider floating vegetated islands to reduce nutrient loads.

CREEK EXTENT
Opportunity to link biodiversity across Warrigal Rd, strengthening flora and fauna health and habitat.

- Site Extent
- Watercourse
- Waterbodies
- Gardiners Creek
- Open Space
- Power Lines
- Monash Freeway
- Roads
- Gardiners Creek Trail
- Path Network
- Train Line
- Train Station
- Pavilion
- Sports Facilities
- Private Sporting Facilities
- Public Toilets
- Playground
- Dog parks
- Park Infrastructure
- Cafe

0 100 200 300 400 m

Glenburn Bend Park
TH King
Glen Iris Station
Glen Iris Wetlands
Darling Park
Darling Station
Alamein Station
Holmesglen Station
Holmesglen Institute
Malvern Valley Golf Club
Chadstone Shopping Centre
Monash Freeway
High St
Malvern Rd
Mona St
Dent St
Munro Ave
Winton Rd
Waverley Rd
Warrigal Rd

BIODIVERSITY

YARRA BIODIVERSITY

Opportunity to connect to the rich biodiversity of the Birrarung (Yarra River) Corridor.

ST KEVINS COLLEGE

Support large landowners to develop revegetation programs.

WEEDS

Creek banks dominated by weed species - Willow and Fraxinus. Remove weed species.

SIR ZELMAN COWEN PARK

High proximity of sporting grounds and ovals. Limited space to expand extensive green canopy.

TALBOT CRES

Opportunity to Increase native planting, biodiversity and tree canopy.

Explore potential land acquisition for increase in biodiversity corridor

TOORAK RD

Opportunity to place lights at strategic locations to increase safety whilst considering any impact that light pollution may have on biodiversity.

TOORAK ROAD LEVEL CROSSING

Potential Significant tree removal in adjacent open space.

TOORONGA PARK

Area of Council revegetation.

Opportunity to explore site suitable for expanding vegetation.

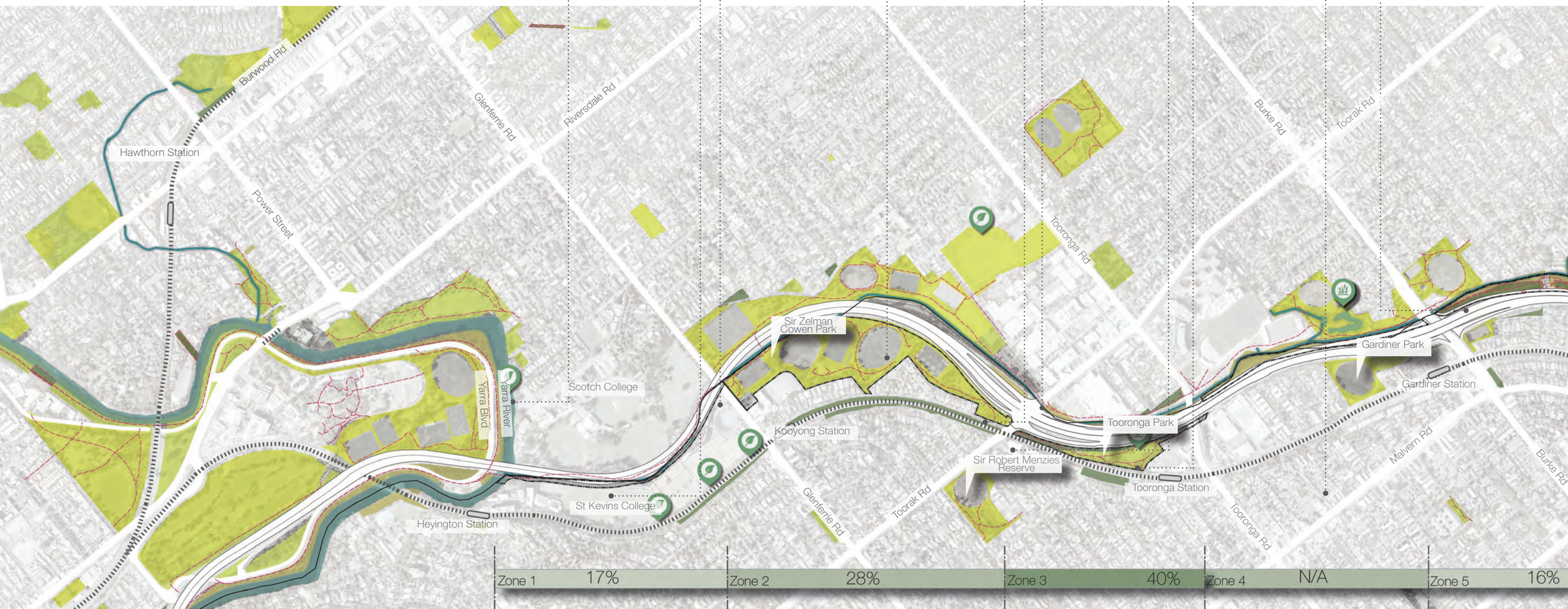
CITY OF STONNINGTON

Opportunity to engage with local landowners regarding waterway health.

TRANSMISSION LINES

Overhead transmission lines require vegetation over 3m tall to be removed.

Opportunity to foster different ecology to fill the void under transmission lines.



BANK STABILITY

Lack of vegetation of creek banks, making edge unstable and prone to erosion.

GLENBURN BEND PARK

Key biodiversity site. Area has been transformed over years by the "Friends of Gardiners Creek", who undertake planting, weed control, and creek clean ups.

Opportunity to enable the Friends of Gardiners Creek to expand, facilitating the rejuvenation and spread of revegetation and community lead action.

T.H KING

Group of large Lemon Scented Gum trees create strong place identity.

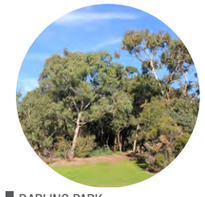
BIODIVERSITY HOTSPOT

Biodiversity sites are Isolated nodes lacking connectivity.

Opportunity to expand existing biodiversity.

DOROTHY LAVER RESERVE

Engage and connect to with Boroondara biodiversity hotspots.



DARLING PARK

Large opens areas containing high levels priority weeds.

Opportunity to explore alternative revegetation and maintenance strategies.

BIODIVERSITY LINKS

Opportunity to use adjacent green corridors to create biodiversity links branching off from the creek.

REVEGETATION

Opportunity to expand current council revegetation along high water level of creek.

MALVERN GOLF COURSE

Support the golf course to increase planting and rejuvenation of flora, creating a highly functioning riparian corridor.

Site Extent
Watercourse
Waterbodies
Gardiners Creek
Open Space
Power Lines
Monash Freeway
Roads
Path Network
Train Line
Train Station
Open Space
Natural/Semi Natural
Transport Reserve
Golf Course/Reserve
Revegetation Areas
Wetlands
Biodiversity Hotspots

0 100 200 300 400 m

Back Creek
Glenburn Bend Park
TH King
Glen Iris Station
Glen Iris Wetlands
Monash Freeway
High St
Malvern Rd
Darling Station
Darling Park
Mortle St
Winton Rd
Dent St
Munro Ave
High St
Alamein Station
Holmesglen Station
Holmesglen Institute
Warrigal Rd
Malvern Valley Golf Club
Waverley Rd
Chadstone Shopping Centre

Zone 6a 53% | Zone 6b 44% | Zone 7 49% | Zone 8 37% | Zone 9 21%

Ecological assessment

One of the most distinctive features of the Gardiners Creek corridor is the green reprieve it provides in a highly urbanised environment. However the overall current ecological condition of Gardiners Creek is moderately poor, with various sections ranging in condition from very poor to moderate.

Its value as habitat lies in the fragmented islands of high faunal and floral species diversity (hotspots), somewhat representative of the original Floodplain Riparian Woodland ecological community. This characteristic is noticeable at many places throughout the corridor, particularly the Glen Iris Wetlands and Glenburn Park in the City of Stonnington. and the Burke Rd South Reserve in City of Boroondara. These not only support a large variety of flora and fauna but are also provide an important space for the local community to enjoy and engage in. These hotspots are joined by a loose corridor of exotic and indigenous canopy cover with low structural and floristic diversity. The current state of the corridor provides suitable habitat for a variety of arboreal marsupials and avifauna with ranges that include the surrounding urban environment, favouring those species with an ability to adapt to the urban fringe.

Gardiners Creek would have provided an East-West migratory pathway for species travelling between the Birrarung (Yarra River) and the Dandenong Valley Parklands. Through targeted revegetation, integrated weed management and an increase in community involvement there is the potential to expand on what currently exists to return the creek line within Stonnington to a level that would represent its original state and function.

Many parts of the corridor either do, or could easily, provide good connectivity to adjacent neighbourhoods. The west end has the highest potential as a link to the Birrarung (Yarra River) corridor, but also the most technically difficult for a range of reasons. Weed pressure is moderate, with some high threat weeds present, which could be managed with standard weed management practices.

Current tree density generally comparable with EVC 56 – tree canopy cover of 20%. This EVC is characterised by eucalyptus species: Eucalyptus camaldulensis, Eucalyptus tereticornis ssp. Mediana & Eucalyptus ovata.

The site has been broken down into zones to survey and analyse them from an ecological point of view. All zones in the masterplan are classified Bioregion Gip and EVC number 56.

Zone 1: The Underpass

Highly degraded creek line dominated by Willow and Fraxinus throughout. Where vegetation exists all the life forms required for a riparian corridor, however, the site is dominated by weeds. Very few native species exist.

This zone, more than any other, has a significant opportunity for connection with the Birrarung (Yarra River) corridor, even though it would be limited— plantings would need to be shade tolerant and irrigated under the motorway. New plantings in/near the bank would need to be protected from water flow, e.g. coir logs until established. Mid-storey species could include cool closed-forest types.

Zone 2: The Sporting Expanse

Lacking in ecological corridors between ovals - some trees present; likewise, these are minimal corridors around margins. There are well-established native and non-indigenous trees. The zone is very lacking in the understory and mid-story. Better riparian corridor examples exist nearby particularly over where the pedestrian bridge crosses Gardiners Creek. Where Zone 2/3 intersect it is currently dominated by high-priority weed species Fraxinus, there is a good opportunity for revegetation. Plenty of bird activity was observed in this area.

Zone 3: The Local Hideaway

Very open woodland comprising of minimal lifeforms apart from some shrubs semi-established trees along with mature exotic native trees, with good, established canopy cover where vegetation exists. Large areas of grassland throughout the zone. Where mulching exists there is minimal ground story or mid-story coverage. Minimal weed cover however there is a large patch of Juncus acutus right next to the bicycle path. Much of the site suitable for revegetation. With the LXRP rail crossing upgrades there is high potential for revegetation works. This zone, however, it is however largely landlocked.

Zone 4: The Forgotten Land

(Not accessible for assessment)

Zone 5: The Narrow Connector

Extremely high variation in percentage cover of native vegetation and weedy vegetation. Areas are lacking in any native cover with representatives of all high-priority weeds found. The existing native vegetation patches have minimal representatives of EVC.

Zone 6: Biodiversity Collector

Glenburn Park, where friends of Gardiners Creek work, there is minimal weed cover and extremely good native cover, however lacking in plants representative of the original EVC. As with other areas, the flora is highly modified with lots of native revegetation, once again many of the species are not part of the EVC, although all life form categories are represented. Very few weeds throughout re vegetated areas. Outside the revegetation areas are lots of large mature woody weeds present, particularly along the creek line edge. There is high potential for revegetation particularly if linked up with Zone 7.

Zone 7: The Urban Cleanser

Good corridors of native vegetation though highly modified with some plant species representative of the EVC. Lacking in climbers scramblers and lower trophic life forms. Nearly all high-priority weeds were found but percentage covers were low. Creek borders overall dominated by large European weeds. It would be beneficial to re-establish native corridors.

Zone 8: The Open Activator

Good corridors of native vegetation though highly modified with plants not representative of EVC. Highly variable percentage covers, Lots of semi-mature eucalyptus. Lots of planted areas have been fenced off. The majority of highly invasive weeds were found on site though it should be noted that most of them were juvenile.

Zone 9: The Forest Fairway

General comments:

- Highly fragmented
- Presence of a number of highly productive Wetlands
- High numbers of significant weed species
- Desirable Eucalyptus spp are generally present at appropriate densities throughout the corridor.
- Revegetation planting already undertaken in areas

On the whole the Golf Course provides an opportunity to create a highly functioning riparian corridor, with various habitats, vegetation communities and food sources for a variety of wildlife. The existing wetlands, canopy cover and topography provide the bones for a potentially successful revegetation project that would further enhance Gardiners creek and the tributaries to which it is connected.

An initial desktop assessment suggested the Golf Course comprised, prior to European Settlement of two distinct Vegetation Communities, Plains Grassy Woodland and Floodplain Riparian Woodland (EVC 55 ad 56 respectively). A site visit and comparison of the vegetation present against the benchmarks found this to be true. The Plains Grassy Woodland EVC (56), was found present across the northern half of the site, in closer proximity to Gardiner's creek and

the existing wetlands. Whilst the Plains Grassy Woodland EVC (55) dominated the drier more elevated positions across the site. Both were present throughout the similar topographies to those which they would have inhabited the area prior to European settlement. When assessed with the similar tool used for the rest of Gardiners Creek, both of the Vegetation Communities were found to be poor representations of their respective EVCs.

Both vegetation communities had the majority of high threat weeds listed for their respective benchmarks. It should be noted that better score for the Plains grassy woodland was due in part to the excessive amount of mulch used by the golf course to suppress weeds, which is well above the benchmark for this EVC (10% cover), which in turn gave a better weed score. It should also be noted that both vegetation communities contained Noxious weeds and Environmental Weeds, declared under the Catchment and Land Protection Act 1994 (CaLP Act) and those listed as Weeds of National Significance (WoNS) as well as a number of "very high-risk weeds" listed by the Arthur Rylah Institutes Report for DEWLP, Advisory list of environmental weeds in Victoria (2018).

Although both of the vegetation communities had varying levels of established canopy cover that came close to the requirements for their respective EVC, both were severely lacking in any understory life forms. Both of the vegetation communities did display signs of current re-vegetation works of varying degrees of success, however it was very obvious that much of the works had been designed with needs of the golf club members in mind rather increasing or enhancing the habitat value of the vegetation communities. There were a number of highly productive small areas, such as the wetlands, scattered throughout each of the vegetation communities that had increased species richness however given their fragmentation throughout the landscape exchange between them would be reduced to highly mobile fauna. Further enhancement of such areas and revegetation works between these fragmented areas has the potential for providing habitat for many species including Growling grass frog, which has been recorded further upstream in Gardiners creek in Box Hill (DELWP 2002).

Ecological survey findings

HABITAT ZONE			*1*	*2*	*3*	*4A**	*4B**	*5*	*6*	*7*
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC number			56	56	56	56	56	56	56	56
Total Area of Habitat Zone(Ha)										
Site condition	Large Old Trees	/10	1	3	0	0	3	3	3	3
	Tree Canopy Cover	/5	0	4	5	0	4	3	4	3
	Lack of Weeds	/15	0	2	13	0	13	11	11	7
	Understory	/25	5	5	5	5	15	15	15	10
	Recruitment	/10								
	Organic Matter	/5	2	5	4	2	5	2	4	2
	Logs	/5	0	0	3	0	2	0	2	2
	Site Condition standardising multiplier									
	Site Condition subtotal									
Landscape Context	Patch Size	/10	8	8	8	8	8	8	8	8
	Neighbourhood	/10	0	0	0	0	0	0	0	0
			16	27	38	15	50	42	47	35
			17%	28%	40%	16%	53%	44%	49%	37%

ZONE	*HABITAT SCORE*	*WEEDS**
Zone 1	17%	0
Zone 2	28%	2
Zone 3	40%	13
Zone 5	16%	0
Zone 6	53%	13
Zone 6	44%	11
Zone 7	49%	11
Zone 8	37%	7
Zone 9	27%	7

*Weeds => this is a score out of 15 where 0 signifies high coverage of significant weeds and 15 is effectively weed-free.

Figure 03. - The local Grey-headed fox is an iconic species

Figure 04. - Melbourne Yellow Gum is an endemic species to Gardiners Creek

Figure 05. - Swift parrot is a significant species under threat

Figure 06. - Pomaderris vacciniifolia is critically endangered

CULTURAL VALUES

SITE OF CONFLICT

Originally Gardiners Station, the site holds history of conflict between indigenous and non-indigenous people during the 1830s. Opportunity to tell the story.

KOOYONG PARK

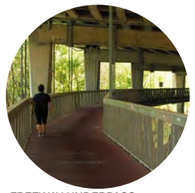
Opportunity to explore indigenous heritage though archeological findings from the 1970s & 80s

TOORONGA PARK

Opportunity to increase local awareness of 'save a dog' to the community and visitors.

GARDINER STATION

Opportunity to increase signage and wayfinding connections between transport hubs and Gardiners Creek



FREEWAY UNDERPASS

Opportunity to utilise large expanse of space for creative lighting under the freeway overpass to enhance character.

GARDINERS CREEK BRIDGE

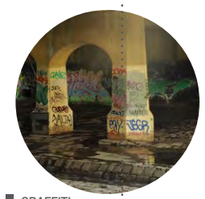
Victorian heritage listed bridge. Opportunity to celebrate this historic bridge.

SIR ZELMAN COWEN PARK BUILDING

Opportunity to upgrade existing club buildings to improve on community facilities.

TOORONGA PARK

Opportunity to provide rest points with creative interpretation to engage community with the stories of Gardiners Creek.



GRAFFITI

Large extents of graffiti located on road and water infrastructure. Opportunity to formalise and encourage art.

SHARED LEARNING

Provide information on re vegetation work by The Friends of Gardiners Creek.

STORAGE AREA

Current storage for Stonnington City Council.

Opportunity for better community use, such as a Sustainability centre or cultural educational facility.

COMMUNITY ENGAGEMENT

Encourage and provide opportunities for community engagement with the creek ecosystems through community workshops and events.

GLENBURN BEND PARK

Provide rest points with creative interpretation to engage community with the stories of Gardiners Creek.

GLEN IRIS WETLANDS

Provide rest points with creative interpretation to engage community with the ecosystems and native flora of the creek.

AREA OF CULTURAL SIGNIFICANCE

Explore opportunities for indigenous ceremony spaces and celebrations of traditional culture and country.

MONASH FREEWAY

Identify areas of creative lighting to provide a positive engagement and safe environment.

Site Extent
Watercourse
Waterbodies
Gardiners Creek
Open Space
Power Lines
Monash Freeway
Roads
Path Network
Train Line
Train Station
Commercial
Public Schools
Private Schools
Council Owned
Cultural Points
Indigenous Historic Sites
Public Art Oppertunity
Wayfinding Intersections
Offline Wayfinding Point

0 100 200 300 400 m

Glenburn Bend Park
TH King
Glen Iris Wetlands
Glen Iris Station
Darling Park
Darling Station
Alamein Station
Holmesglen Station
Holmesglen Institute
Malvern Valley Golf Club
Chadstone Shopping Centre
High St
Malvern Rd
Monash Freeway
Mona St
Munro Ave
Dent St
Winton Rd
Waverley Rd
Warrigal Rd

GOVERNANCE

Gardiners Creek is a dynamic corridor that fulfils various functions. Its ownership and management is however fragmented and complex due to the complex network of large critical city infrastructure that runs through and adjacent to the corridor.

The corridor is spread across multiple council and management boundaries, the creek corridor requires a collaborative approach with all stakeholders to achieve the best results for all parties.

SPORTS CLUBS

Opportunity to seek ongoing engagement with sports teams and their management. Further safety and awareness to local teams regarding other users and etiquette.

MELBOURNE WATER

Opportunity to seek ongoing engagement with Melbourne Water, including opportunities to provide support to creek naturalisation, maintenance strategies and creek access.

STOCKLAND SHOPPING CENTRE

Seek opportunities for engagement with connections between Gardiners Creek and the shopping centre including signage, bike parking, native planting and incentives local shops to support use of the corridor

COMMUNITY

Work with residents and owners in relation to proposed new planting initiatives.

VIC ROADS

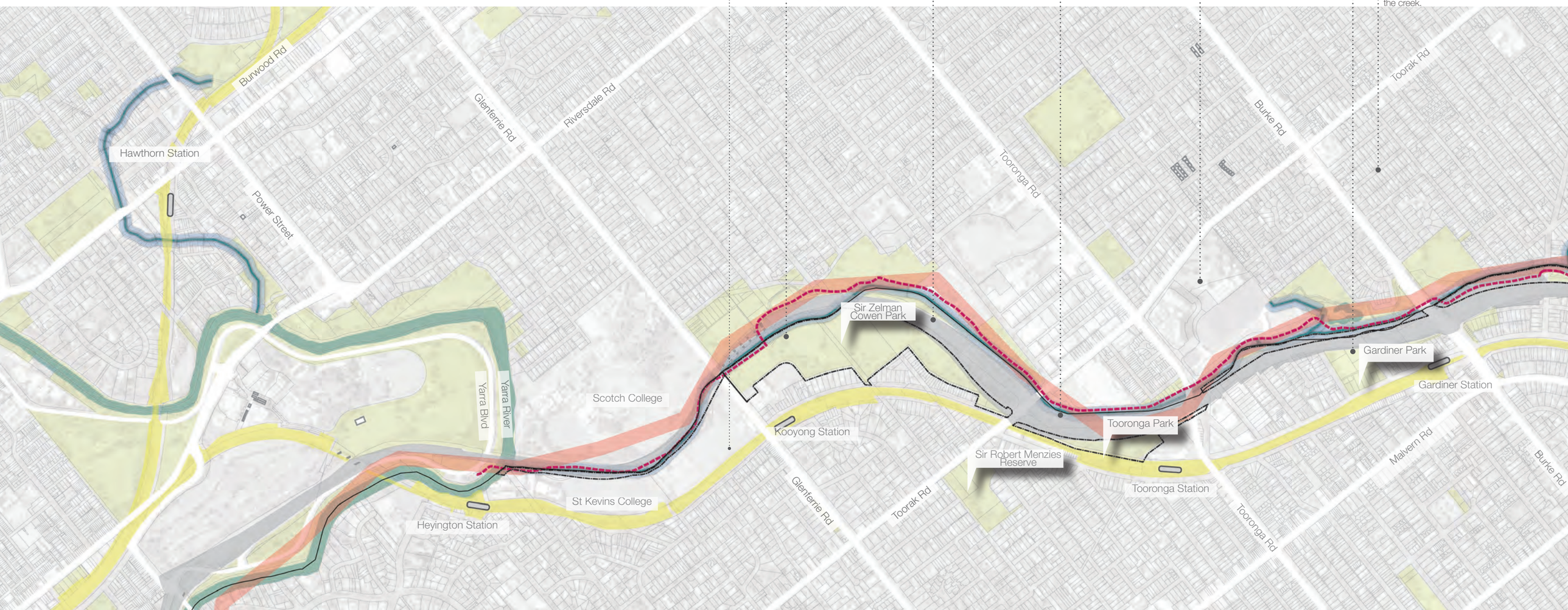
Opportunity to seek engagement and collaboration with Vic Roads to provide better corridor interaction, privacy, sound proofing, planting and maintenance.

AUSNET

Regulations regarding planting underneath power lines currently limited to 3 meters in height. Will have implications to revegetation.

BOROONDARA COUNCIL

Seek engagement and collaboration with Boroondara Council to create a cohesive corridor infrastructure, signage and materials and on going management of the creek.



COMMUNITY

Provide information to residents about native ecologies through various methods (including signage, websites, booklets etc.)

Encourage Friends of groups and promote revegetation, monitoring and stewardship.

Encourage the implementation of green roofs & walls as both public and private open space across the municipality, in particular in areas of increased density.

Increasing community awareness around correct waste management practices and the environmental impact of waste disposal.

VILLAGE CENTRES

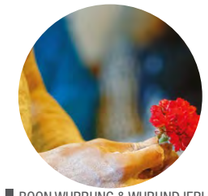
Encourage the implementation of green roofs & walls as both public and private open space across the municipality, in particular in areas of increased density.

Increasing business awareness around correct waste management practices and the environmental impact of waste disposal.

Increase awareness of Gardiners Creek locality and connections through community business engagement.

VIC TRACK

Engage and seek collaboration in increased signage, infrastructure and education of Gardiners Creek at train stations along the corridor.



BOON WURRUNG & WURUNDJERI PEOPLES OF THE KULIN NATION

Actively engage with traditional owners of the Boon Wurrung and Wurundjeri Peoples and connected indigenous tribes to celebrate and inform the sharing of knowledge and culture as an intrinsic part of Gardiners Creek, it's community and future.

Provide opportunities for the continuity and sharing of indigenous culture and knowledge.

Increase awareness of indigenous history throughout the corridor

Build upon Stonnington's Reconciliation Action Plan (2018 - 2020) throughout the extent of Gardiners Creek

HOLMESGLEN INSTITUTE

Opportunity to link educational programs to the creek corridor providing learnings and benefits for both student and environment.

BUSINESS CENTRE

Engage with business parks and local offices to increase awareness of creek corridor, open space and connectivity for recreational use of open space and decrease in individual car use over public transport.

MUSWELL BEND

Provide support to local businesses and growth in connection to the Gardiners Creek corridor.

DARLING PARK

Incorporation of City of Boroondara to achieve successful outcomes.

MALVERN GOLD COURSE

Support to local land owners the guidance on increase of native biodiversity, public access and ongoing maintenance

Site Extent

Watercourse

Gardiners Creek Trail

Local Council Boundary

Open Space

VicRoads / Department of Transport / TransUrban

AusNet

Melbourne Water

Victrack

0 100 200 300 400 m

Glenburn Bend Park

TH King

Glen Iris Station

Glen Iris Wetlands

Monash Freeway

High St

Malvern Rd

Mona St

Darling Park

Darling Station

Winton Rd

High St

Dent St

Munro Ave

Alamein Station

Holmesglen Station

Holmesglen Institute

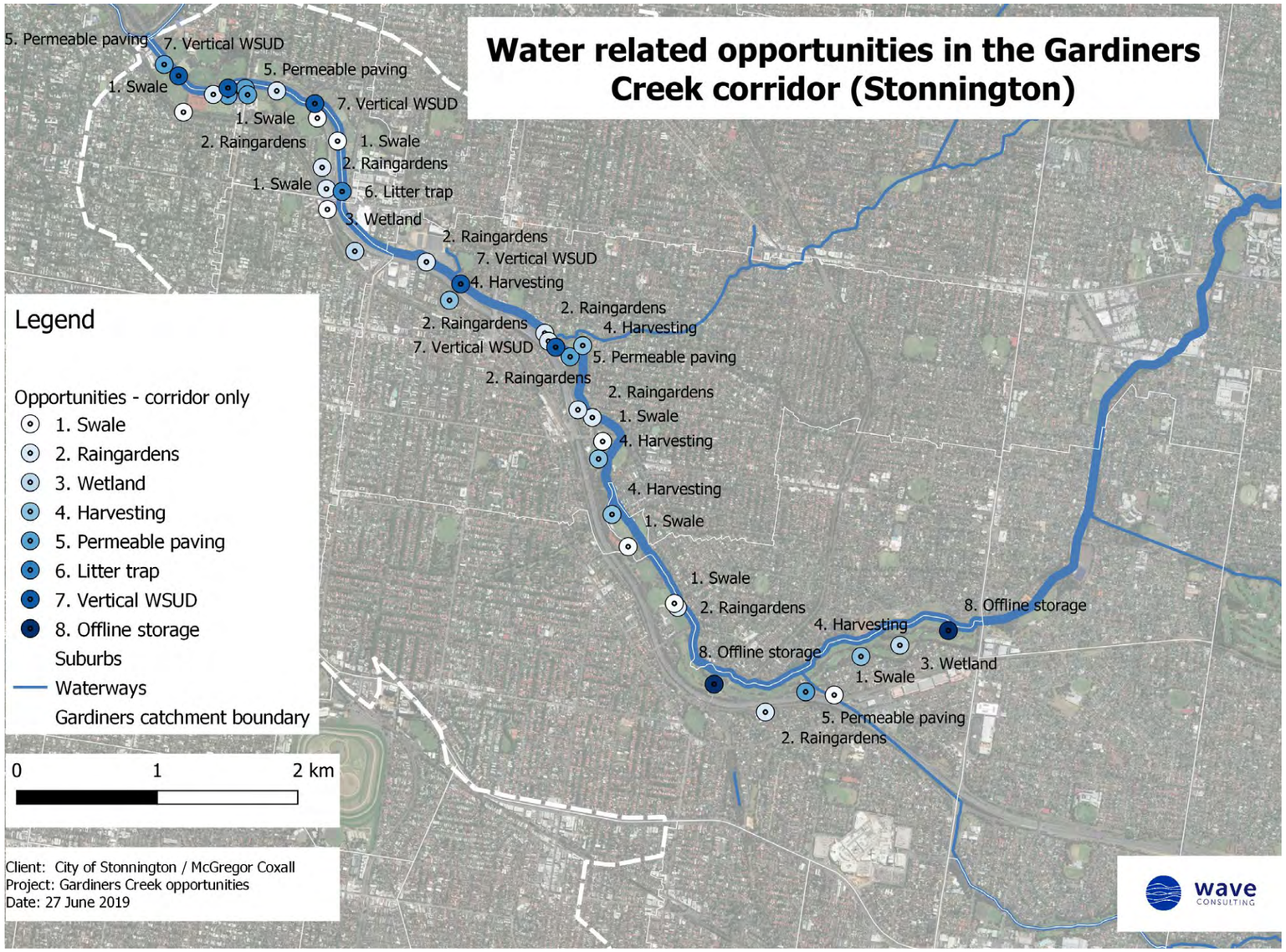
Warrigal Rd

Malvern Valley Golf Club

Waverley Rd

Chadstone Shopping Centre

1.5. Water related opportunities & findings



1.6. Possible Offline water storage

The upstream offline storage option could create detention of anywhere from 50,000 m3 to 200,000 m3 of space to retain flood waters that flow from the upstream urban areas of Gardiners Creek. A reshaped golf course could act as a wetland, storage and harvesting system and iconic piece of green infrastructure in the middle of this urban catchment.

Other retarding basins like this in the city include Lewis Park (Knox) and Jacana Wetland (Moreland).

The benefits of this type of option are that it could:

- Reduce peak floods, in minor to major flooding
- It is ideally placed in the middle of the catchment
- It captures flows from Scotchman's Creek
- It would reduce the impact of flooding (ie litter and erosion) on the lower section of Gardiners Creek and reduce maintenance costs
- Provide urban cooling to the area
- Add to the biodiversity value of the area, and potentially connect with the Glen Iris Wetlands

To effectively manage flooding and improve the quality of the Gardiners Creek, this option alone would not be enough, and a catchment wide solution is required with buy in from all councils and Melbourne.

The concept itself is to create an off stream flow path, and a series of different depressions and different depths in a large open environment like the golf course.


1. Swale
2. Raingardens
8. Offline storage
3. Wetland
4. Harvesting
8. Offline storage
5. Permeable paving
1. Swale
2. Raingardens

1.7. Revegetation Analysis

VEGETATION ANALYSIS REFERENCE TABLE

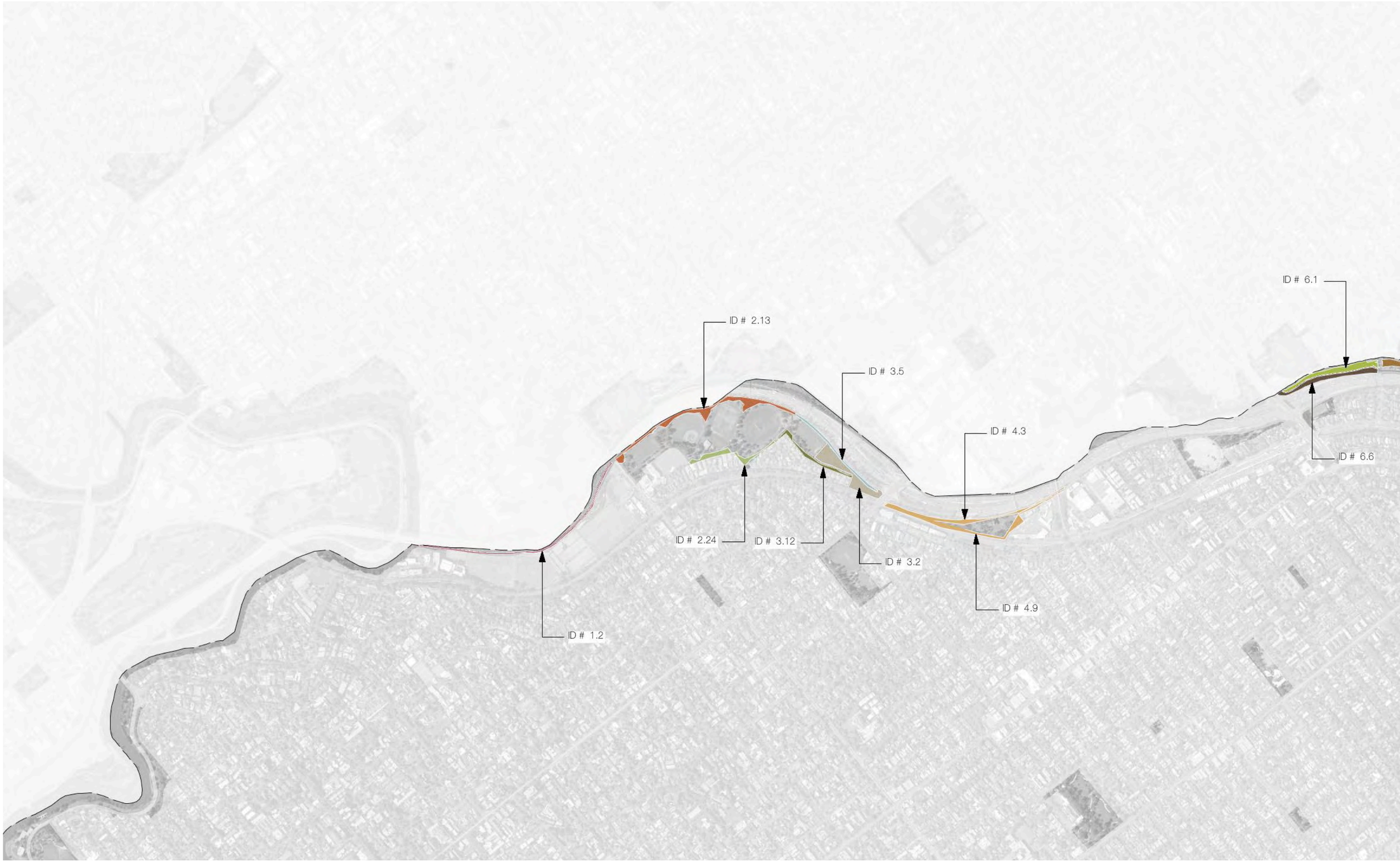
'Masterplan ID' refers to the masterplan identification numbers shown on the zone plans. These areas are also shown mapped on the following spread.

MASTERPLAN ID	ID	Area m2	CurrentCov	PropCov	Diff	Reveg area	Maintenance Hrs/Yr	Prep	Mulch (m3)	Mulch supply & install cost	Plants @ 4/m2	Plants supply & install cost
8.6	1	46180	60%	90%	30%	13,854	55.4	$ **4,156**			13854	$ **38,099**
9.2	2	950	30%	80%	50%	475	1.9	$ **143**			1900	$ **5,225**
9.25	3	6800	60%	90%	30%	2,040	8.2	$ **612**	510	$ **4,692**	8160	$ **22,440**
9.15	4	2800	20%	90%	70%	1,960	7.8	$ **588**	210	$ **4,508**	7840	$ **21,560**
9.27	9	2900	40%	90%	50%	1,450	5.8	$ **435**	218	$ **3,335**	5800	$ **15,950**
9.22	10	5000	60%	100%	40%	2,000	8.0	$ **600**			8000	$ **22,000**
1.2	11	9400	0%	100%	100%	9,400	37.6	$ **2,820**	705	$ **21,620**	37600	$ **103,400**
2.24	13	4000	20%	90%	70%	2,800	11.2	$ **840**	300	$ **6,440**	11200	$ **30,800**
3.12	16	2950	20%	90%	70%	2,065	8.3	$ **620**	221	$ **4,750**	8260	$ **22,715**
3.2	18	9750	20%	40%	20%	1,950	7.8	$ **585**	731	$ **4,485**	7800	$ **21,450**
6.3	19	6350	40%	90%	50%	3,175	12.7	$ **953**	476	$ **7,303**	12700	$ **34,925**
6.10	20	4550	60%	90%	30%	1,365	5.5	$ **410**	341	$ **3,140**	5460	$ **15,015**
6.1	21	5800	10%	100%	90%	5,220	20.9	$ **1,566**	435	$ **12,006**	20880	$ **57,420**
6.6	22	5450	60%	100%	40%	2,180	8.7	$ **654**	409	$ **5,014**	8720	$ **23,980**
7.4	24	6450	50%	80%	30%	1,935	7.7	$ **581**	484	$ **4,451**	7740	$ **21,285**
7.7	25	3850	40%	90%	50%	1,925	7.7	$ **578**	289	$ **4,428**	7700	$ **21,175**
7.13	26	25700	60%	90%	30%	7,710	30.8	$ **2,313**	1928	$ **17,733**	30840	$ **84,810**
4.3 & 4.9	27	11800	20%	90%	70%	8,260	33.0	$ **2,478**	885	$ **18,998**	33040	$ **90,860**
2.13	28	9650	40%	90%	50%	4,825	19.3	$ **1,448**	724	$ **11,098**	19300	$ **53,075**
3.5	29	3000	50%	100%	50%	1,500	6.0	$ **450**	225	$ **3,450**	6000	$ **16,500**
13.4	30	4150	60%	80%	20%	830	3.3	$ **249.00**	311	$ **1,909**	3320	$ **9,130**
10.11	31	8400	50%	70%	20%	1,680	6.7	$ **504.00**	630	$ **3,864**	6720	$ **18,480**
11.6	32	2000	60%	80%	20%	400	1.6	$ **120.00**	150	$ **920**	1600	$ **4,400**
12.1	33	1200	60%	80%	20%	240	1.0	$ **72.00**	90	$ **552**	960	$ **2,640**
12.5	35	9500	30%	60%	30%	2,850	11.4	$ **855.00**	713	$ **6,555**	11400	$ **31,350**
11.8	36	6050	30%	60%	30%	1,815	7.3	$ **544.50**	454	$ **4,175**	7260	$ **19,965**
10.4	37	3300	30%	60%	30%	990	4.0	$ **297.00**	248	$ **2,277**	3960	$ **10,890**
10.5	39	2100	30%	60%	30%	630	2.5	$ **189.00**	158	$ **1,449**	2520	$ **6,930**
10.13	40	5800	20%	50%	30%	1,740	7.0	$ **522.00**	435	$ **4,002**	6960	$ **19,140**
10.14	41	2100	30%	60%	30%	630	2.5	$ **189.00**	158	$ **1,449**	2520	$ **6,930**
13.6	42	5000	50%	90%	40%	2,000	8.0	$ **600.00**	375	$ **4,600**	8000	$ **22,000**
11.9	43	13150	40%	80%	40%	5,260	21.0	$ **1,578.00**	986	$ **12,098**	21040	$ **57,860**
11.12	44	27500	40%	90%	50%	13,750	55.0	$ **4,125.00**	2063	$ **31,625**	55000	$ **151,250**
11.7	45	6250	40%	90%	50%	3,125	12.5	$ **937.50**	469	$ **7,188**	12500	$ **34,375**
12.6	46	5600	30%	80%	50%	2,800	11.2	$ **840.00**	420	$ **6,440**	11200	$ **30,800**
10.9	47	7000	20%	80%	60%	4,200	16.8	$ **1,260.00**	525	$ **9,660**	16800	$ **46,200**
10.16	48	2350	30%	90%	60%	1,410	5.6	$ **423.00**	176	$ **3,243**	5640	$ **15,510**
11.12	49	5100	20%	90%	60%	3,060	12.2	$ **918.00**	383	$ **7,038**	12240	$ **33,660**
11.5	50	1900	60%	70%	10%	190	0.8	$ **57.00**	143	$ **437**	760	$ **2,090**
13.7	51	11350	50%	80%	30%	3,405	13.6	$ **1,021.50**	851	$ **7,832**	13620	$ **37,455**
10.1	53	1600	50%	90%	40%	640	2.6	$ **192.00**	120	$ **1,472**	2560	$ **7,040**
10.17	54	7850	20%	80%	60%	4,710	18.8	$ **1,413.00**	589	$ **10,833**	18840	$ **51,810**
						0	0.0	$ -	0	$ -	0	$ -
						132,444	**529.8**	$ **39,733**	**19534**	$ **267,065**	**488,214**	$ **1,342,589**

Definitions	
Area	Surface area in square metres of the ground identified for revegetation
CurrentCov	The proportion of the ground with adequate vegetation cover
PropCov	The proportion of the ground with proposed vegetation cover
Diff	The effective area of revegetation required in square metres.
Maintenance Hrs/Yr	Minimum annual labours required to maintain the vegetation quality
Prep	Cost of ground preparation, usually two passes of weed spraying and/or physical removal
Mulch	Quantity of mulch required assuming whole surface area to be covered to 75mm depth
Mulch supply & install cost	Cost of supplying and installing mulch
Plants @ 4/m2	Quantity of plants required to achieve proposed habitat, averaged at 4/m2
Plants supply & install cost	Cost of supplying and installing plants

Standards & Rates				
Ongoing Maintenance Labour				
Minimum	40	hrs/Ha/Yr		
Best	96	hrs/Ha/Yr		
Preparation (weed spraying/removal)		$	0.30	per m2
Supply & spread mulch		$	2.30	per m2
Supply & install 200cc tubestock		$	2.75	per plant

VEGETATION ANALYSIS REFERENCE PLAN



MCGREGOR COXALL


ID # 6.3
ID # 7.13
ID # 7.4
ID # 6.10
ID # 7.7
ID # 8.6
ID # 9.2
ID # 9.5
ID # 9.15
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ID # 11.12
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0 100 200 300 400 500 M

1.8. Path Amendments

Capital City Trail

Yarra River

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a Gravel. Existing
   - Gravel. New/Upgrade
   - b Boardwalk. Existing
   - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

MCGREGOR COXALL

Sir Zelman Cowen Park

Glenferrie Road

Kooyong Station

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a Gravel. Existing
   - Gravel. New/Upgrade
   - b Boardwalk. Existing
   - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

MCGREGOR COXALL

Cowen Park

Monash Freeway

Toorak Road

Toorak Road

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a Gravel. Existing
   - Gravel. New/Upgrade
   - b Boardwalk. Existing
   - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

MCGREGOR COXALL

Toorak Road

Toorak Road

Tooronga Road

Tooronga Road

Tooronga Station

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a Gravel. Existing
   - Gravel. New/Upgrade
   - b Boardwalk. Existing
   - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a
     - Gravel. Existing
     - Gravel. New/Upgrade
   - b
     - Boardwalk. Existing
     - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

Gardiner Park

Tooronga Road

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Pavements
1. Gardiners Creek Trail
Shared User Path Existing
Shared User Path New/Proposed
2. General Access Path (SUP)
Existing
New/Upgrade
3. Adventure Trails
a
Gravel. Existing
Gravel. New/Upgrade
b
Boardwalk. Existing
Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
New/Upgrade
Special Slow Zones
5.
New
0 10 20 30 40 50 M
Great Valley Road
Great Valley Road
Bourke Road
MCGREGOR COXALL
Gardiner Station
xli

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a
     - Gravel. Existing
     - Gravel. New/Upgrade
   - b
     - Boardwalk. Existing
     - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

High St

High St

High St

TH King

Glen Iris Station

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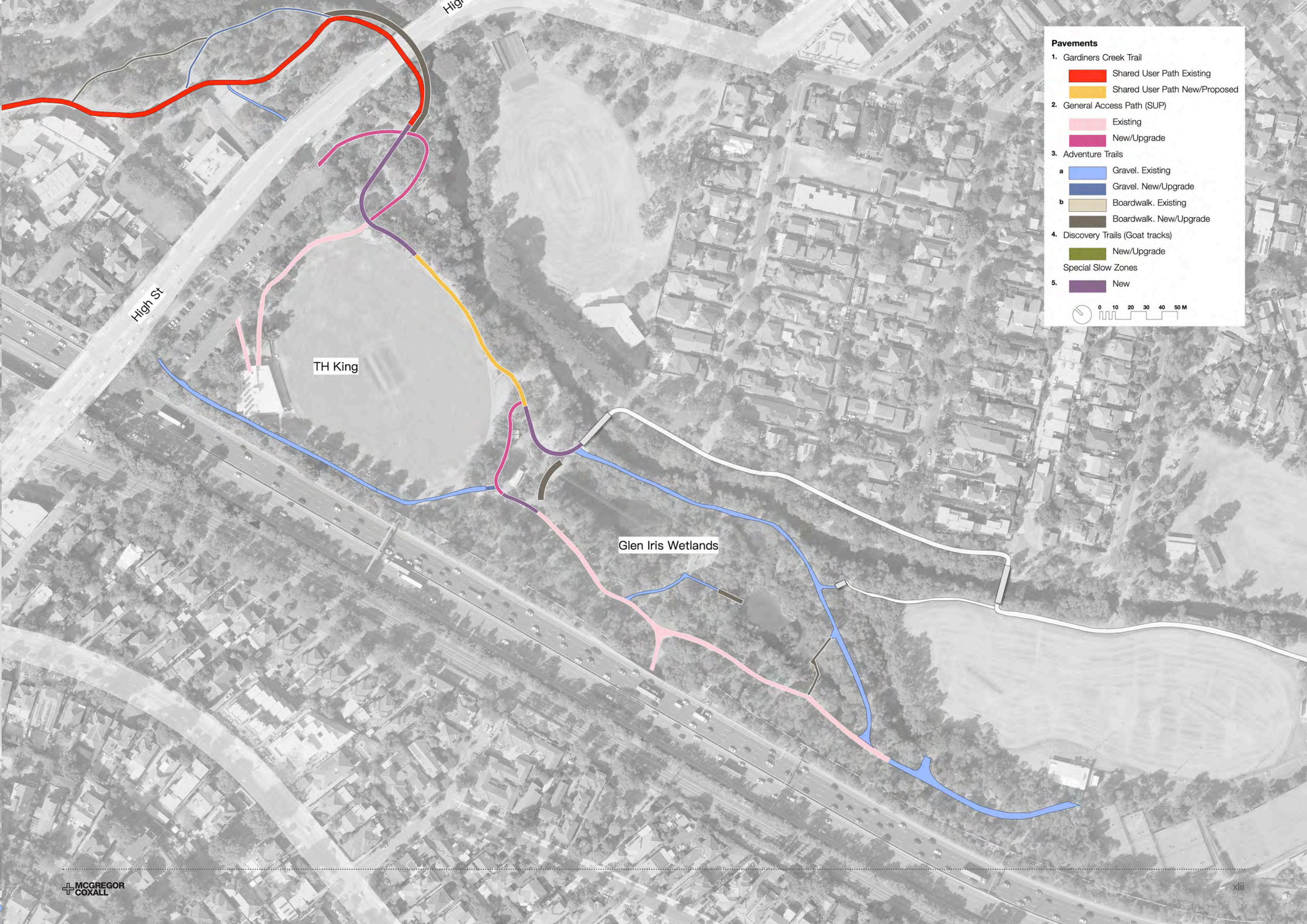
High St
TH King
Glen Iris Wetlands
Pavements
1. Gardiners Creek Trail
Shared User Path Existing
Shared User Path New/Proposed
2. General Access Path (SUP)
Existing
New/Upgrade
3. Adventure Trails
a
Gravel. Existing
Gravel. New/Upgrade
b
Boardwalk. Existing
Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
New/Upgrade
Special Slow Zones
5.
New
0 10 20 30 40 50 M

Dunlop St

Darling Park

Dunlop St

Darling Station

Winton Rd

Pavements

1. Gardiners Creek Trail
   - Shared User Path Existing
   - Shared User Path New/Proposed
2. General Access Path (SUP)
   - Existing
   - New/Upgrade
3. Adventure Trails
   - a
     - Gravel. Existing
     - Gravel. New/Upgrade
   - b
     - Boardwalk. Existing
     - Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
   - New/Upgrade

Special Slow Zones

5. New

0 10 20 30 40 50 M

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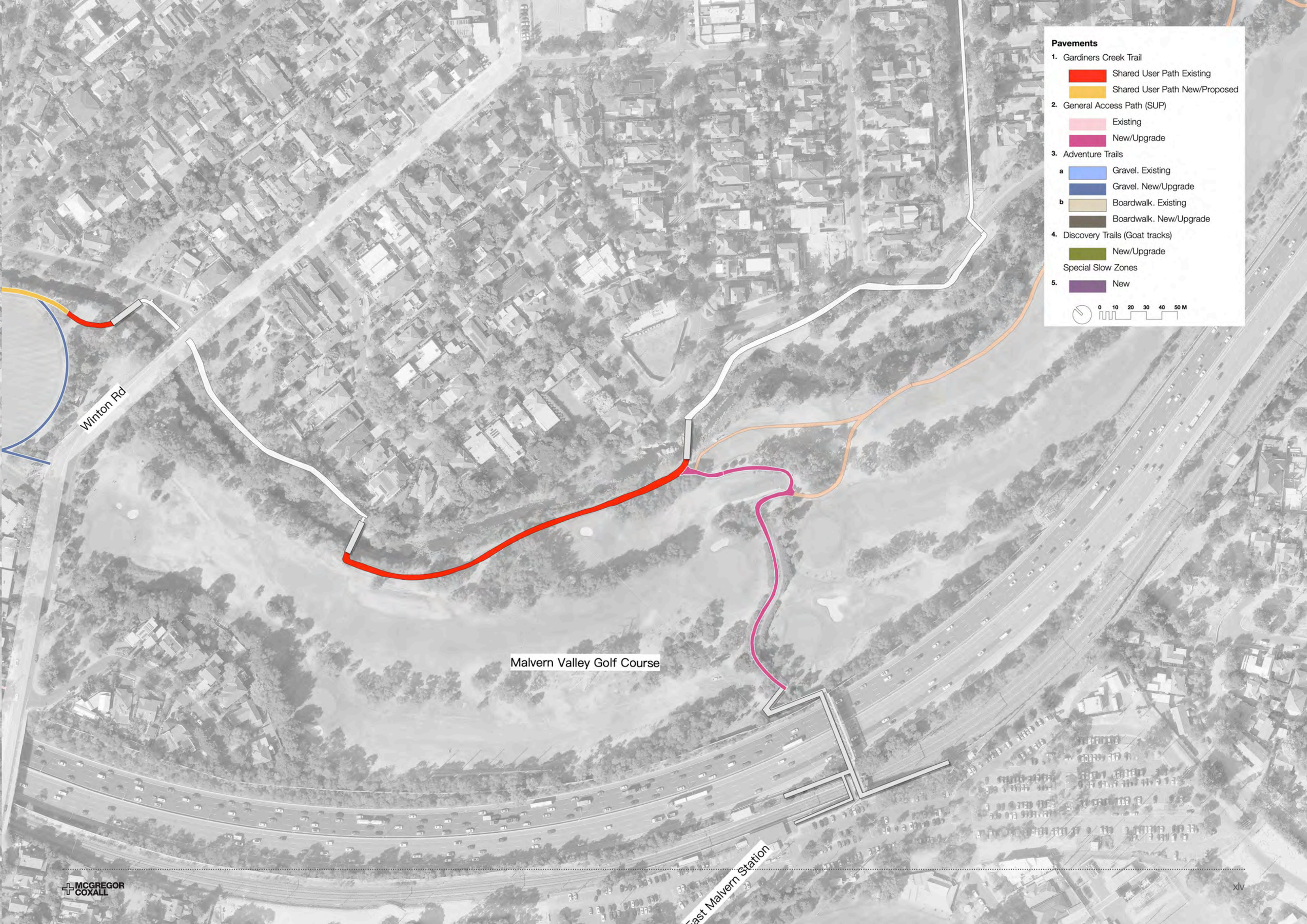
Pavements
1. Gardiners Creek Trail
Shared User Path Existing
Shared User Path New/Proposed
2. General Access Path (SUP)
Existing
New/Upgrade
3. Adventure Trails
a
Gravel. Existing
Gravel. New/Upgrade
b
Boardwalk. Existing
Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
New/Upgrade
Special Slow Zones
5.
New
0 10 20 30 40 50 M
Winton Rd
Malvern Valley Golf Course
East Malvern Station

MCGREGOR COXALL


Pavements
1. Gardiners Creek Trail
Shared User Path Existing
Shared User Path New/Proposed
2. General Access Path (SUP)
Existing
New/Upgrade
3. Adventure Trails
a
Gravel. Existing
Gravel. New/Upgrade
b
Boardwalk. Existing
Boardwalk. New/Upgrade
4. Discovery Trails (Goat tracks)
New/Upgrade
Special Slow Zones
5.
New
0 10 20 30 40 50 M

MCGREGOR COXALL

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LANDSCAPE ARCHITECTURE
URBANISM
ENVIRONMENT
BIOCITY RESEARCH