

A photograph of a dense forest with many thin trees and a path leading through them. The trees are mostly bare, suggesting a late autumn or winter setting. The path is narrow and appears to be made of dirt or gravel. The overall tone is somewhat muted, with a lot of brown and grey in the tree trunks and branches.

# **SYDNEY WATER Waterway Health Improvement Program**

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**Design Report**  
City of Parramatta  
Milson Park Upgrade Plan





# Sydney WATER

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## 1.1 Introduction

This project is a joint project between Sydney Water and the City of Parramatta. Sydney Water is currently undertaking a Waterway Health Improvement Program [WHIP] which is focussing on treating stormwater draining to waterways. Milson Park is one of the sites that have been identified as a feasible site for stormwater treatment.

The City of Parramatta is currently developing an open space upgrade to Milson Park. The open space upgrade is looking at a range of measures to improve amenity and ecology at the park which are aligned with the community's vision and needs. The natural stormwater treatment system at Milson Park is one of the open space upgrades currently being planned.

Sydney Water has funded this report and is currently planning for a stormwater treatment system at Milson Park. Sydney Water's objectives include improving waterway health, providing habitat to improve urban ecologies and to improve the character of open space and liveability at the site.

The City of Parramatta's objectives include providing better facilities for the community, improved utilisation of open space, improved connectivity through the site and aligned with the Parramatta Ways strategy, catering for increased local population growth associated with new development and improved waterway and bushland health at the site.

This report is focussing on Milson Park. It should be noted that consultation was undertaken concurrently for Milson Park with Shannons Paddock (adjacent to Milson Park). Preliminary planning has commenced for Shannons Paddock and it is intended that a similar design report and upgrade plan be completed for Shannons Paddock in the near future.

## 1.2 Project Background

Sydney Water owns approximately 450 kilometres of stormwater and waterway infrastructure spread across more than 70 catchments in Sydney. This drainage infrastructure services more than half a million people. Sydney Water's assets in these catchments are typically trunk drainage which receive inflows from a range of other agencies.

Improving waterway health and enhancing urban environments is an important part of Sydney Water's strategy to enhance the liveability of Sydney. One aspect of this is reducing the impact of stormwater pollution on waterway health. Sydney Water has developed a waterway health improvement program [WHIP] to help achieve this objective. The waterway health program consists of approximately 20 projects across the catchments of the Georges, Cooks and Parramatta Rivers. These rivers are iconic parts of Sydney's cultural heritage both Aboriginal and European.

The intended physical outcomes of the program include:

- Remove 100,000 kg/year of sediment from the waterways
- Prevent 1,500 kg/year of nitrogen and 750 kg/year of phosphorus from entering these waterways
- Remove 100 m<sup>3</sup>/year of litter from these waterways
- Achieve a 1000 ML/year reduction in annual runoff through these waterways.

The following benefits are expected from the program:

- Improve waterway health by removing sediment and nutrient flows, together with a reduction in the volume and intensity of stormwater flows from contributing catchments
- Improve the visual appearance of the waterways by reducing litter/gross pollutants loads
- Create a positive stakeholder and customer response in areas where waterway health works are delivered.
- Increase the capability of Sydney Water and Councils to undertake projects of this nature in the future.

## 1.3 Study Area

Milson Park is located in the Parramatta City Local Government Area (LGA) within the Parramatta River Catchment. It is one of a number of local parks and open spaces in the Parramatta City LGA measuring 6.9 ha. It provides a playground and passive recreational open space for the local community. The site contains a Sydney Water owned stormwater drainage channel which flows to Toongabbie Creek and ultimately to Parramatta River.







## 1.4 Report Structure and Project Methodology

This report will be updated progressively over the course of the project with the ultimate goal of producing a single, stand alone Design Report for all of the 13 WHIP sites. This report will be supported by a range of technical reports that cover various aspects of the project in further detail.

The Design Report will cover the evolution of each site through the initial project analysis phase, concept design options, preferred concept development and finally the detailed concept design stage. The diagram opposite illustrates the design stages, as well as the expected inputs that will feed in and support the design report at each stage.

The current content of the design report is outlined below:

**1.0 Introduction:** Contains a background to the overall WHIP including a geographical understanding of the project sites and the catchments included in the works. A description of the site in the context of its local suburb/neighbourhood is also provided.

**2.0 Site Analysis:** This section outlines the key findings of the project team covering a wide range of topics including history, overview of site features, receiving waters, environment, access and movement as well as services and infrastructure that need to be considered during the design process.

**3.0 Design Principles:** This section summarises the key findings and sets out the design objectives and principles for the concept design phase.

**4.0 Landscape Improvement Plan:** This section contains the preferred landscape improvement plan option and highlights the key design elements associated with ecology and habitat, connectivity, amenity and recreation opportunities.

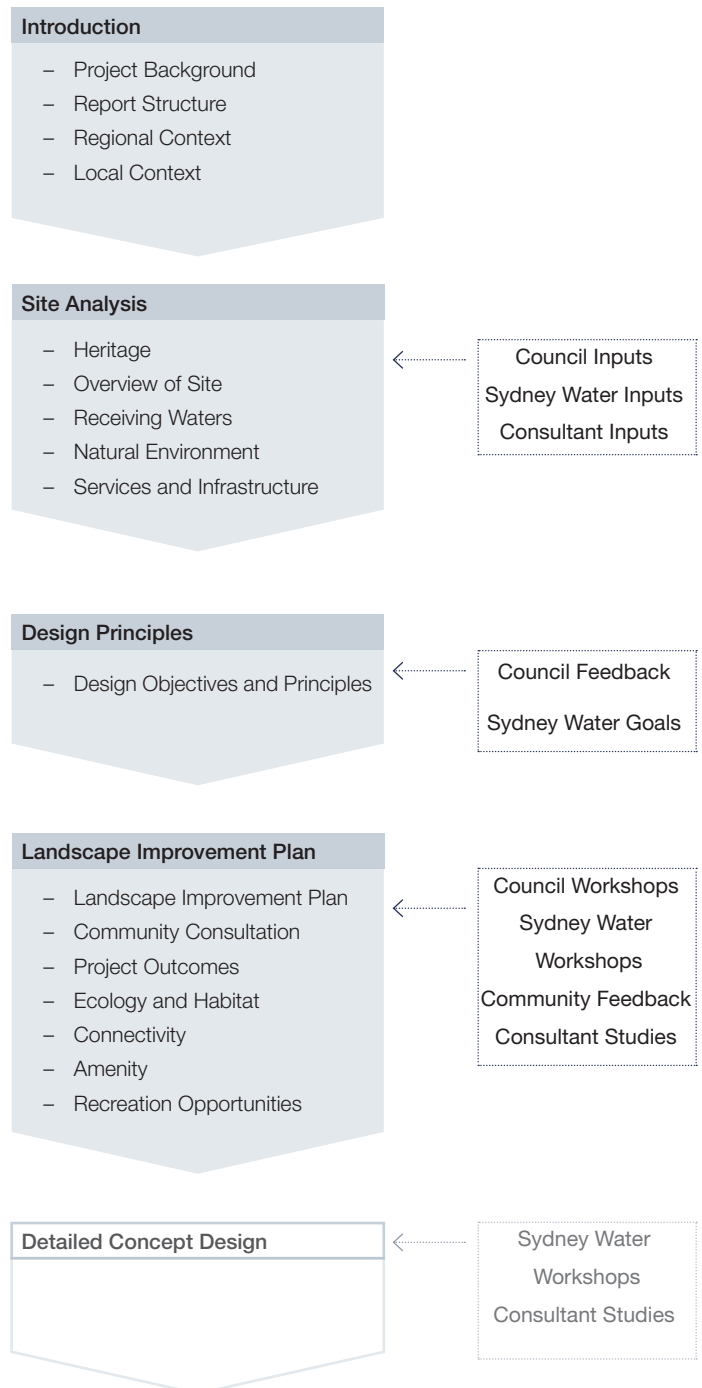


Figure 1.01 - Report Structure and Project Methodology





Figure 1.02 Regional Context





## 1.5 Regional Context

Of the 20 capital projects to be undertaken, this WHIP is focusing on 13 stormwater treatment systems including swales, bioretention systems, wetlands and waterway naturalisation works.

The 13 projects are located in the inner to middle ring suburbs of Sydney. Sydney is home to 4.3 million residents and as the capital of NSW, is a significant hub. Sydney's natural environment of mountains, beaches and its waterways provide a backdrop for the built environment and are a significant contributor to its liveability. A key tenet of the NSW Government's (2014) *"A Plan for Growing Sydney"* is to recognise these highly prized environments and put in place safeguards to protect and enhance them. The Plan identifies the West Central Subregion, which includes the Greater Parramatta district, as a key area for protecting the natural environment, including improving the health of waterways and aquatic habitats. This project is one aspect which contributes to this goal.

This project is focused on the following waterways and their catchments within Sydney:

- **Parramatta River catchment** which is more than 250,000 hectares in size and home to approximately 1 millions people
- **Georges River catchment** which is more than 900,000 hectares in size and home to more than 1 million people
- **Cooks River catchment** which is more than 100,000 hectares in size and home to approximately 400,000 people

These catchments are made up of highly diverse communities and a wide range of land-uses including residential, industrial, commercial, bushland and open space.

The rivers and their associated waterways and riparian zones are used by a variety of communities for a range of recreational activities including swimming, boating, fishing, walking, cycling, sports and passive recreation. They are also home to a range of flora and fauna, including birds, fish, frogs and reptiles, some of which are critically endangered.





Figure 1.03 Local Context





## 1.6 Local Context

This report focuses on one of the 13 WHIP sites, Milson Park and Shannons Paddock in Westmead. The site is located in the Parramatta City LGA and measures approximately 6.9 ha with the southern section of Shannons Paddock measuring approximately 2.45 ha. It is surrounded by a range of land uses including, educational and health facilities, a range of residential densities, general industrial, environmental conservation areas and natural waterways.

Milson Park is located in a culturally diverse area. The 2016 Census states that 74.6% of the total population in Westmead were born overseas. The top three birth places for overseas residents were India (36.3%), China (4.8%), Sri Lanka (4.2%). 25.4% of the population were born in Australia.

Westmead features a number of educational and health facilities and is considered one of the largest health, education, research and training precincts in Australia (Westmead Redevelopment, 2017). Within a 500 m radius, there are approximately 13 educational and health facilities including Westmead Private Hospital backing on to Milson Park.

Milson Park is located on the western edge of the Westmead Health, Education and Research Precinct which is being investigated for new jobs and homes by the Department of Planning in association with City of Parramatta and the Westmead Alliance. The Precinct is envisioned to accommodate up to 30,000 new jobs as well as new housing by 2037 [www.planning.nsw.gov.au].

The City of Parramatta is aspiring to improve the liveability of Parramatta through the implementation of additional cycling and pedestrian networks as part of the 'Parramatta Bike Plan' and 'Parramatta Ways'.

The Parramatta Bike Plan is proposing bike facilities throughout the Westmead area which features a route through Shannons Paddock and Milson Park. The proposal features an off road shared path that will travel from Wentworth Ave in the south, along the Finlaysons Creek corridor and through Shannons Paddock and Milson Park. This route is planned to link into the Mons Road shared path and travels further east along the Toongabbie Creek corridor towards the Parramatta River.

Milson Park is located between the suburbs of Wentworthville to the west and North Parramatta to the east. Toongabbie Creek transects the site to the north with Darcy Road and Briens Road bounding the southern and western edges of the park.

The site is overlooked by a number of mixed use housing blocks on the south-eastern boundaries which have no direct access to the park. Through site movement is very poor, especially with regards to pedestrian connections to the existing fitness station in the eastern section of the park, approximately 300 m from the nearest pedestrian access point into the park.

A water catchment area is any area of land where precipitation collects and drains of into a common outlet. The local catchment for the site covers an area of 92.9 ha. The catchment starts along the northern side of Great Western Highway and falls towards the north through residential lots, local roads and various open spaces.









## 2.1 Heritage

The British settled in Parramatta in the late 1700's soon after they discovered Sydney's sandy coastal soil was no good for farming. Parramatta provided good soils and a source of fresh river water which was ideal for farming.

The area of Westmead, previously known as West Meadow, is a subdivided section of land from the western section of the Governors Domain. Since the establishment of Westmead in 1889, orchards were established by many of the settlers on the fertile flood plain soils.

The 1943 aerial image below shows Milson Park and the surrounding area of Westmead to be largely occupied by farming land. The image also shows Finlayson's Creek meandering around 2 lots on the south-eastern side of Briens Road. Today, this is a stormwater canal that runs straight through those former lots, parallel to Briens Road.

A place of Aboriginal heritage significance exists at the junction of Finlayson's Creek and Toongabbie Creek. This zone is shown in Figure 2.01.

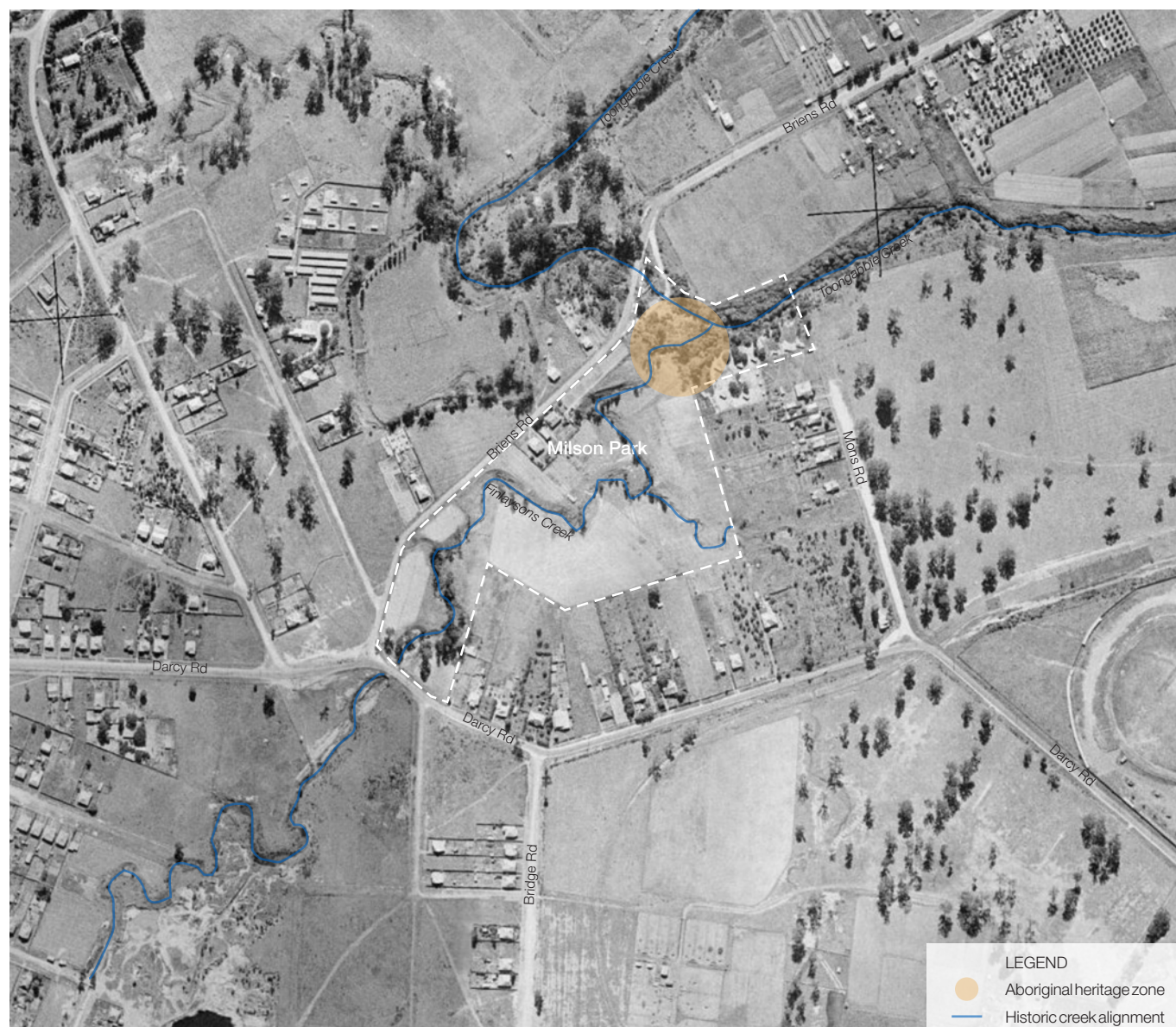


Figure 2.01 1943 Aerial of Milson Park site [maps.six.nsw.gov.au]



## 2.2 Overview of Site

### 2.2.1 Type of Open Space

Milson Park is a large passive open space made up of dense vegetation and large areas of lawn. The lawn to the eastern and western sides of the park are maintained regularly whereas the central area is fenced and is informally home to a local resident's horses.

Finlaysons Creek runs through the site in the form of an open storm water canal which replaced the meandering path of the previous Finlaysons Creek, this connects to Toongabbie Creek. Toongabbie Creek is approximately 9 km long and passes through the northern section of Milson Park flowing to the east before adjoining to the head of the Parramatta River. Toongabbie Creek is a highly polluted watercourse that brings high flows through the site during heavy rain fall events. Large amounts of rubbish also pass through during these events.



Figure 2.02 Finlaysons Creek stormwater canal at southern end of the park



Figure 2.04 Rubbish collected around flood line of Toongabbie Creek



Figure 2.06 Access to Toongabbie Creek

Finlaysons Creek also passes through Shannons Paddock to the south. Shannons Paddock, measuring approximately 2.45 ha, features large areas of open space surrounded by residential development. There is planting featured around the boundary of the site with a children's playground in the northern corner which is accessible from Darcy Road.

### 2.2.2 Key Site Users

The park is used by neighbouring residents for walking, relaxation, experiencing nature and for the fitness station at Milson Park. A section of Milson Park is also used as an informal paddock for horse owners.



Figure 2.03 Horses grazing in central open space area



Figure 2.05 Fitness station backing onto neighbouring residents



Figure 2.07 Dense vegetation along creek embankment



## 2.3 Receiving Waters and Flood Impacts

The site is bounded by Finlaysons Creek and Toongabbie Creek. A small creek line also drains through the site and into Finlaysons Creek. The majority of Finlaysons Creek is a concrete lined channel except for a small section of natural channel in Milson Park. Toongabbie Creek flows into the upper Parramatta River, upstream of the weirs, before flowing into the lower estuarine part of the Parramatta River.

The receiving waters have been heavily altered and impacted by urbanisation and have poor water quality. Figure 2.08 shows that parts of Milson Park are flood affected from overlapping and overland flow associated with Finlaysons Creek.

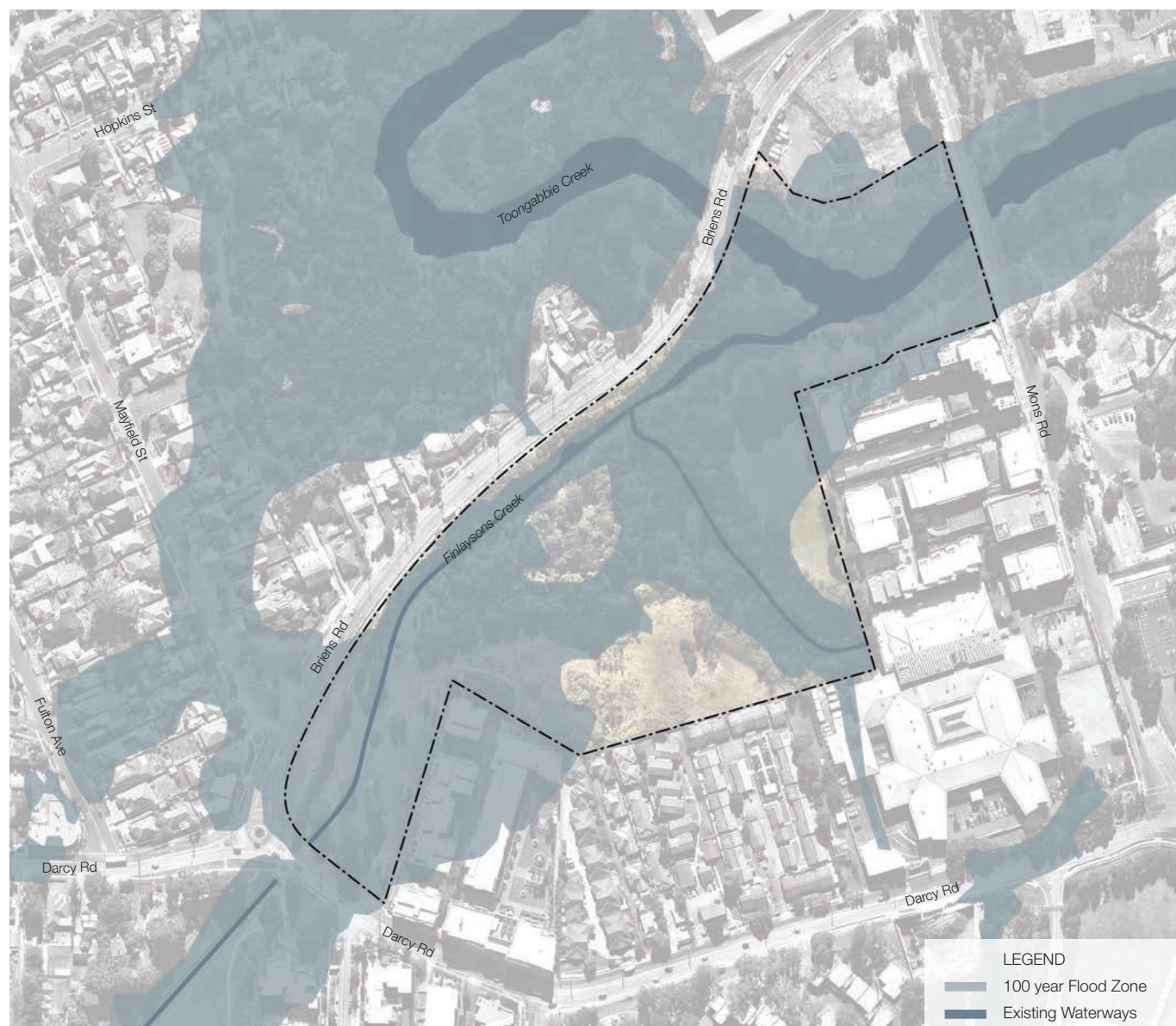


Figure 2.08 Flood Impacts



## 2.4 Land Ownership and Zoning

Milson Park is zoned RE1 public recreation and is surrounded by a range of land uses including, educational and health facilities, a range of residential densities, general industrial, environmental conservation areas and natural waterways. The natural waterways located throughout the park divide the site into a number of different spaces. To the north of Milson Park there are a number of environmental conservation zones that are made up of Cumberland Riverflat and Swamp Oak Riparian Forest, these zones are surrounded by natural waterways, general industrial and low density residential land uses. Land zoned under B4 mixed use contains medium density residential, low density residential and hospital / health services.

Toongabbie Creek and the creek embankments underneath Briens Road bridge are registered as crown owned land, as well as a block of land zoned as RE1 to the east of Mons Road. Finlaysons Creek stormwater canal is owned by Sydney Water.

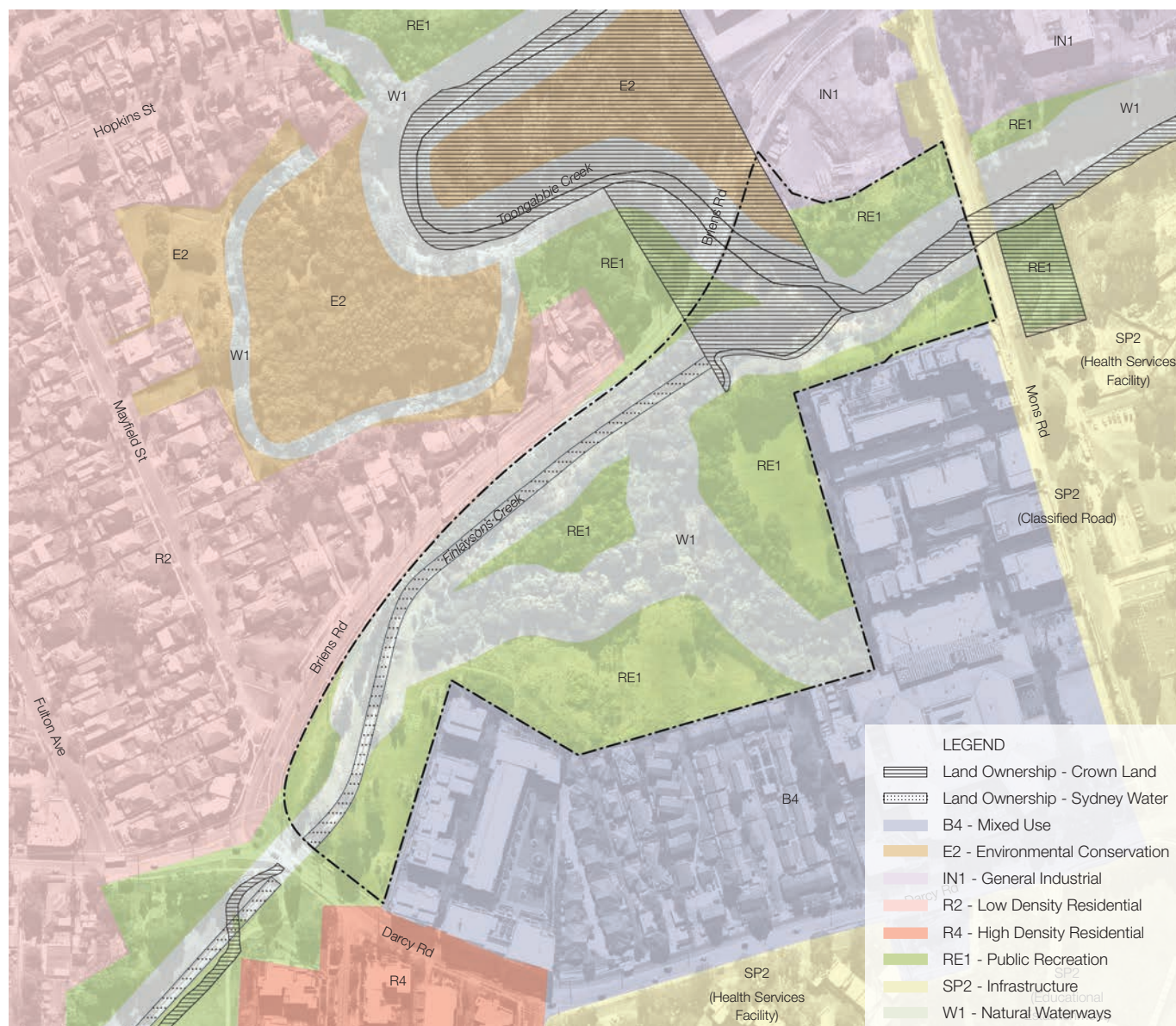


Figure 2.09 Land Ownership and Zoning



## 2.5 Access and Movement

The site is a destination for passive recreation users families that use the playground amenities. The surrounding roads are relatively busy with Darcy Road made up of 4 lanes providing a majority of east-west movement throughout Westmead.

Mons Road features an on-road cycle route that turns into a shared path over Toongabbie Creek. This cycle route continues down Darcy Road travelling south-east before connecting into Parramatta Park. The north bound cycle route connects onto Briens Road and onto a shared path that travels north-west parallel to the North-Western Transit way.

Pedestrian movement throughout the site is very poor. Entrance to the park is accessible from the surrounding pedestrian footpaths. Toongabbie Creek is also accessible from Briens Road. The Finlayson's Creek stormwater channel is a barrier to pedestrians accessing the

park from Briens Road. Access to the children's playground is poor yet there are desired pedestrian lines that extend from Shannon's Paddock in the south, crossing Darcy Road and extending towards Toongabbie Creek in the north. Access from the north-eastern corner of Milson Park is off Mons Road, with vehicle access off the eastern side of Mons Road. The Redbank Track runs alongside Toongabbie Creek and adjoins with a network of other bushwalk tracks in the City of Parramatta Council area. The Redbank bushwalking track hugs the banks of the Toongabbie Creek and connects to the Pemulwuy Loop track in the north and the Governor Philip Walk in the south along the Parramatta River.

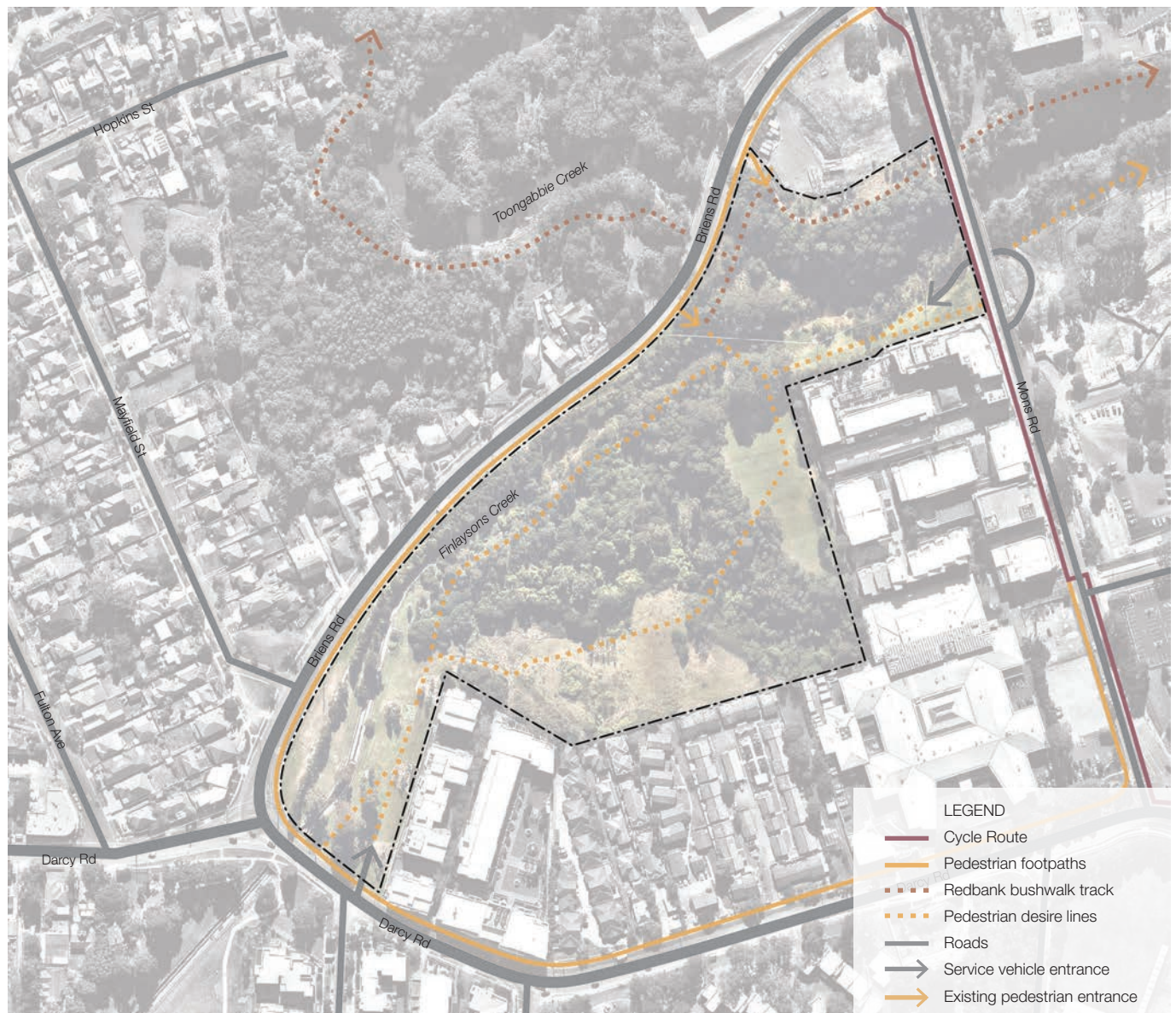


Figure 2.10 Access and Movement



## 2.6 Services and Infrastructure

A Dial Before You Dig (DBYD) survey was conducted in June 2017. The survey revealed the presence of underground services from a number of utilities in the vicinity of Milson Park.

The majority of services in the area are located around the southern perimeter of Milson Park. Underground services include Sydney Water stormwater pipes that connect to the Finlayson's Creek stormwater canal (also owned by Sydney Water). Sewer mains enter the site at various locations and join a transect line that travels through the middle of the park from the south-west to north-east, discharging into Toongabbie Creek in the north.

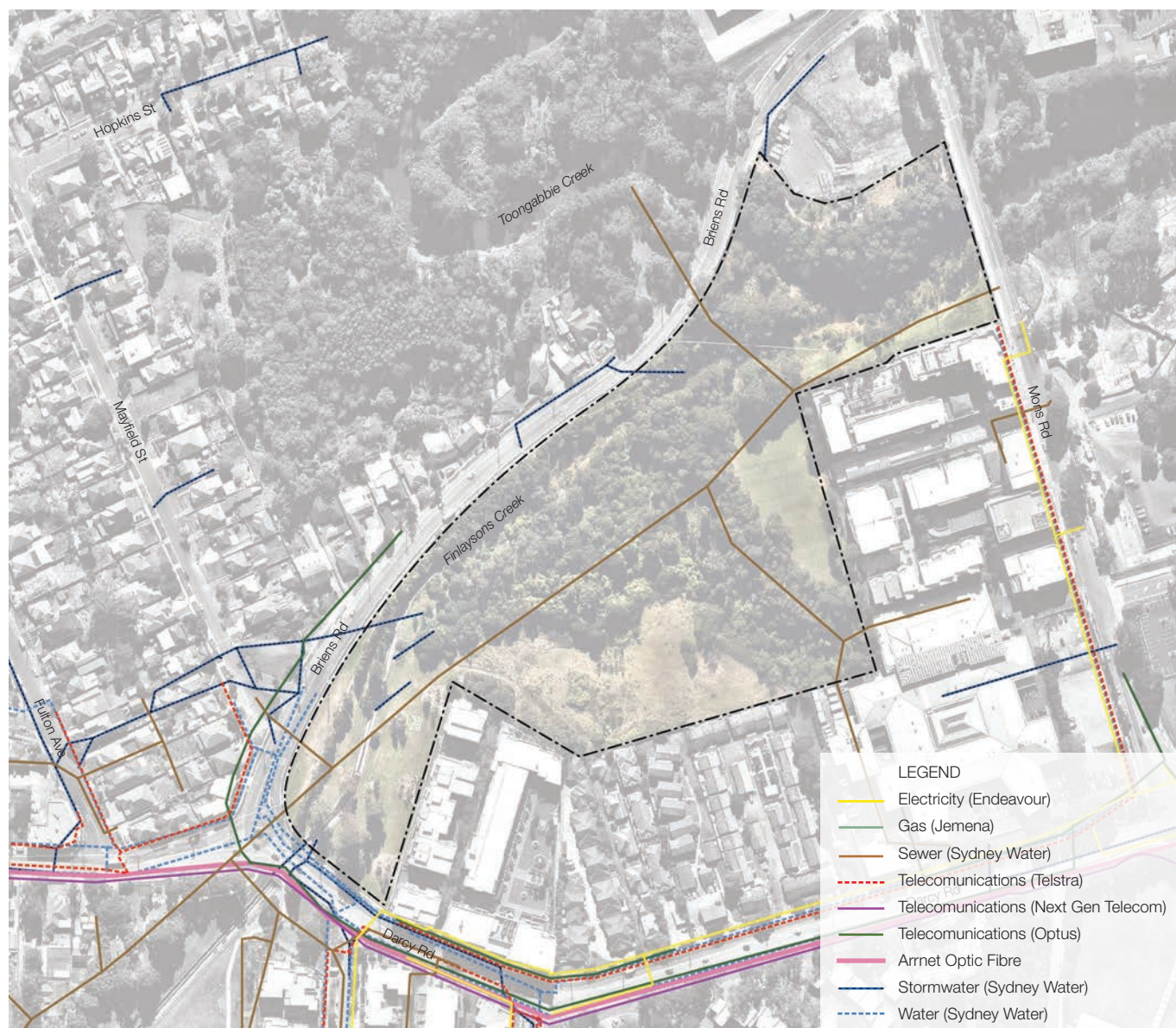


Figure 2.11 Services and Infrastructure



## 2.7 Natural Environment

### 2.7.1 Vegetation Communities

Vegetation at Milson Park consists of mown and unmown grass and dense mature vegetation predominately around the waterways. The vegetation is categorised as Cumberland Riverflat Forest and Cumberland Swamp Oak Riparian Forest. A number of Casuarinas along the former creek line are considered remnant as are the Eucalyptus close to Briens Road on either side of the canal.

There is a formalised line of planting between Finlayson's Creek stormwater channel and Briens Road that runs for approximately 200 m before merging into the revegetated planting of the creek line embankment which has been undertaken periodically over the past two decades.

### 2.7.2 Geology and Soils

The geological formation at Milson Park is Bringelly Shale of the Wianamatta Shales Group. The lithology is made up of shales and clays with some fine to medium grained sandstone.

Overlying this geology is the blacktown soil landscape (bt), which is a reflection of the underlying geology. The bt soil landscape is residual and formed through leaching and weathering of the underlying parent rock. It is made up of sandy clays that are highly erodible and have poor fertility and drainage (Eco Logical Australia, 2010).



Figure 2.12 Dense vegetation surrounding waterways



Figure 2.13 View south-west through planting beds



Figure 2.14 Finlayson's Creek changing from stormwater canal to creek



Figure 2.12 View east towards playground and neighbouring residents



### 2.7.3 Topography

The areas surrounding Milson Park generally fall towards Toongabbie Creek. The park itself falls in a number of different directions that are consistent with the existing layout of the waterways that transect through the site. The areas that feature open lawn are relatively flat. A topographic map of the site (with 2 m contours) is shown in the figure below.

### 2.7.4 Acid Sulphate Soils

A review of the Office of Environment and Heritage NSW Acid Sulphate Soil mapping database indicates that there is no record of acid sulphate soils on the site.

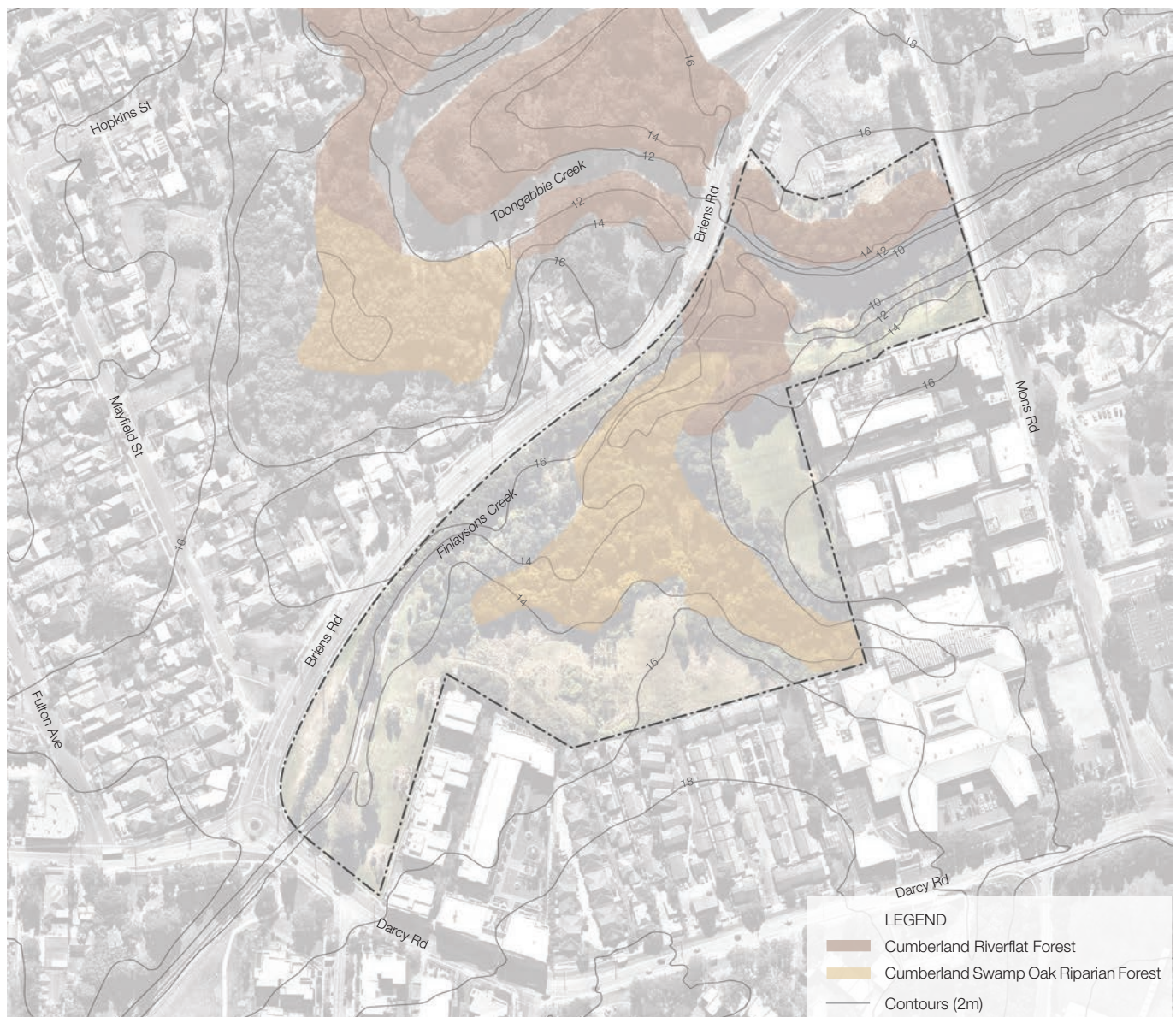


Figure 2.13 Topography [2 m Contours]



## 2.8 Future Development

According to the Westmead Alliance's 'Westmead Innovation District: Building Western Sydney's jobs engine Strategic Vision 2016-2036', the following facilities are projected to be completed as a part of the Westmead Precinct Redevelopment over the next 20 years:

- University of Sydney educational and Research Facilities (2019)
- Westmead Innovation Centre (2020)
- Children's Medical Research Institute Stage 2 (2020)
- Westmead redevelopment Stage 1 (2020)
- Western Sydney University campus redevelopment (2021)
- Parramatta Light Rail arrives at Westmead (2023)
- Children's Medical Research Institute stages 3,4, and 5 (2025)
- Parramatta North Urban Transformation Program (2026).

The above highlights the projected growth around Milson Park will continue over coming decades. This growth will further increase its value to the growing community as a programmed open space, providing a wide range of opportunities for recreation. Equally important will be maintaining ecological functions on the site, including the valuable habitat that exists today, in the face of increasing development.

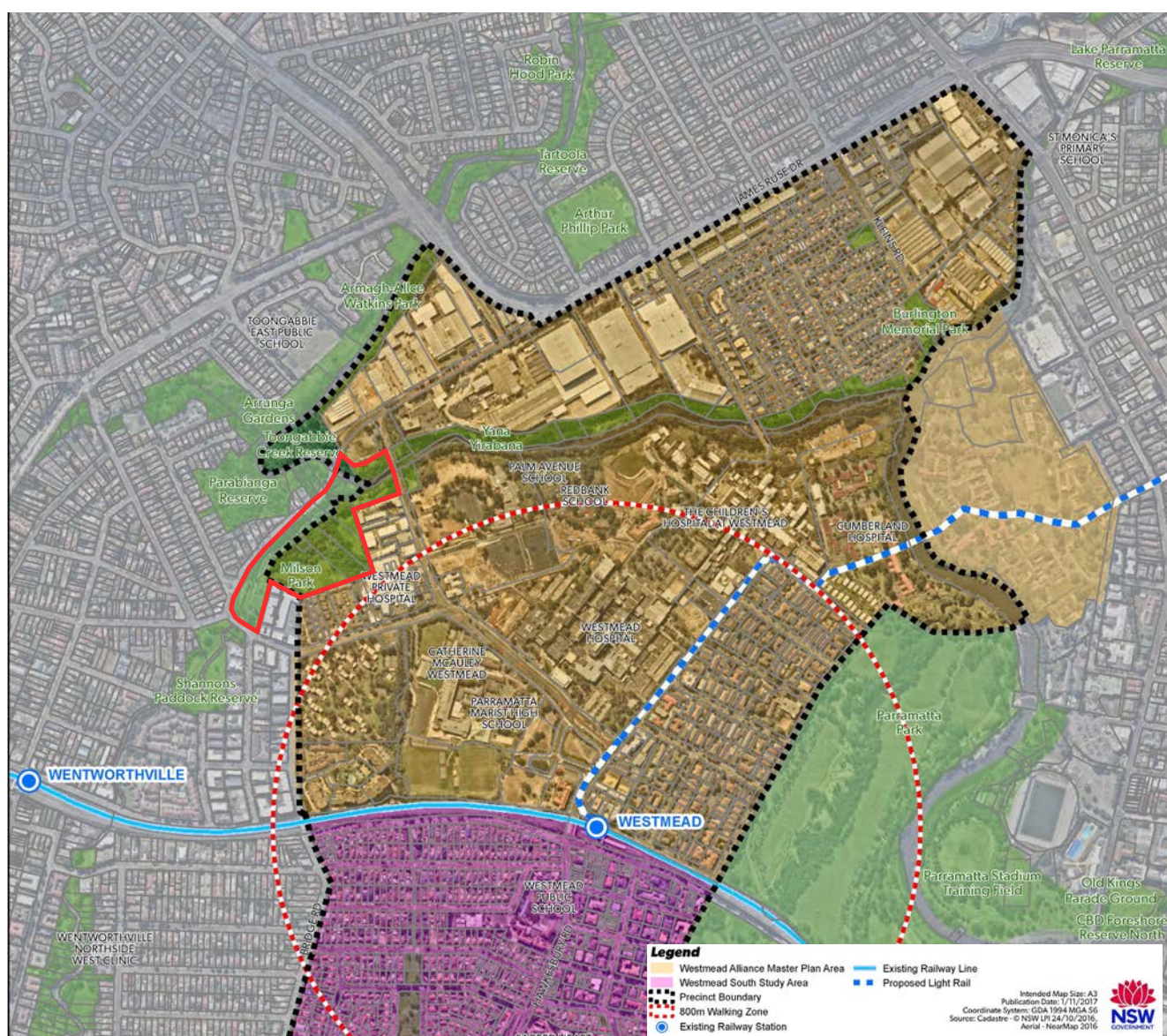


Figure 2.14 Westmead Precinct Plan [adapted from [www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)]



## 2.9 Key Opportunities and Constraints

The following key opportunities and constraints have been identified through the site analysis and are illustrated in the diagram below.

These opportunities and constraints include:

- Finlayson's Creek Channel as a barrier for east-west movement
- Poor movement network and connections with surrounding developments within the park in all directions
- Opportunity to enhance all waterways transecting through the site
- Large number of surrounding residents with back turned to park
- Opportunity to connect to Shannon's Paddock in the south-west
- Opportunity to connect to Parramatta Park in the east.

These opportunities and constraints will inform the landscape improvement plan concept to be developed for Milson Park.

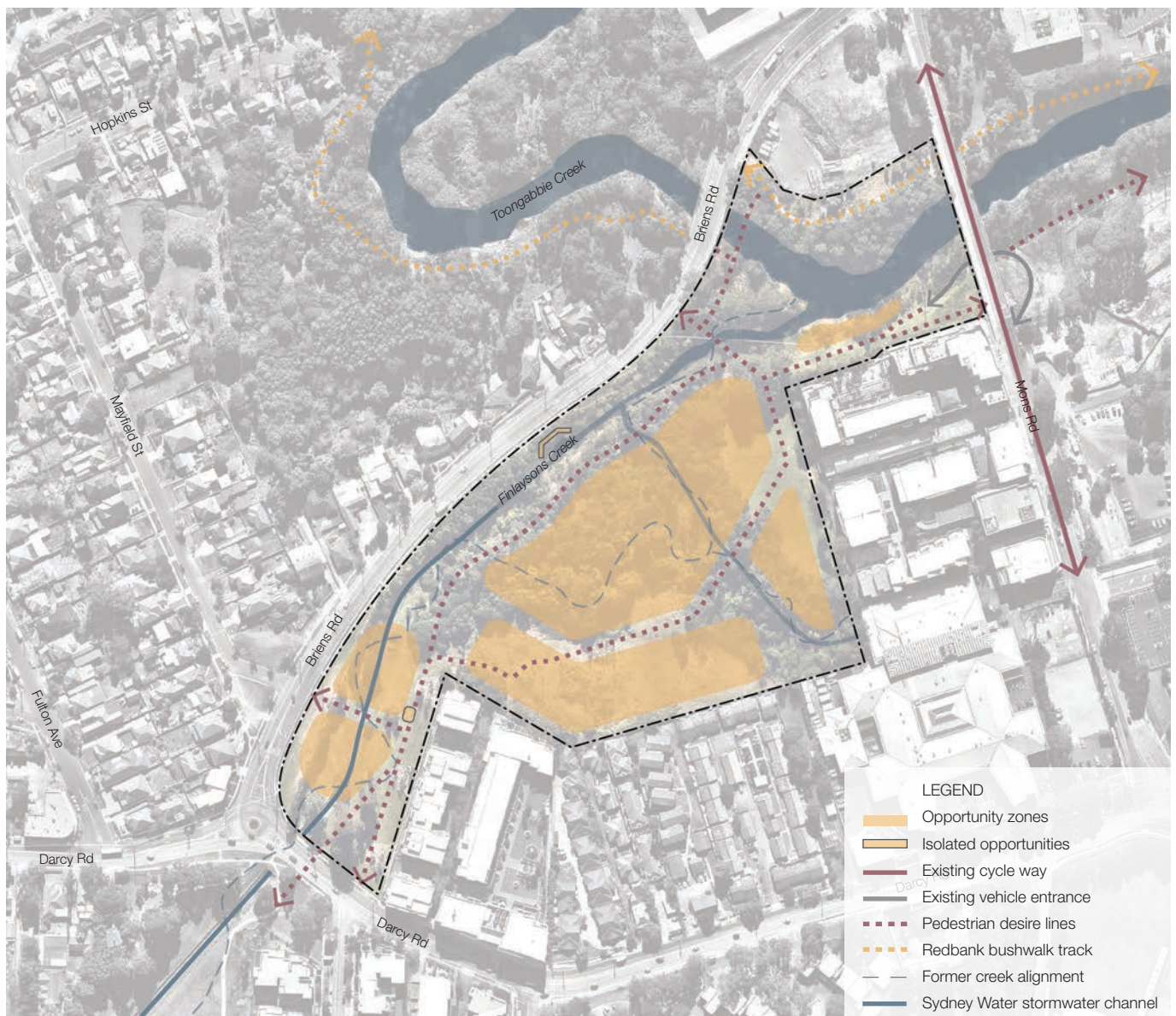


Figure 2.15 Key Opportunities and Constraints







**3.0**

**PRINCIPLES AND OBJECTIVES**



### 3.1 Design Principles

The design principles provide a platform from which the design concepts for Milson Park will be developed. The principles ensure a consistent design approach that considers all factors influencing and impacting the site.

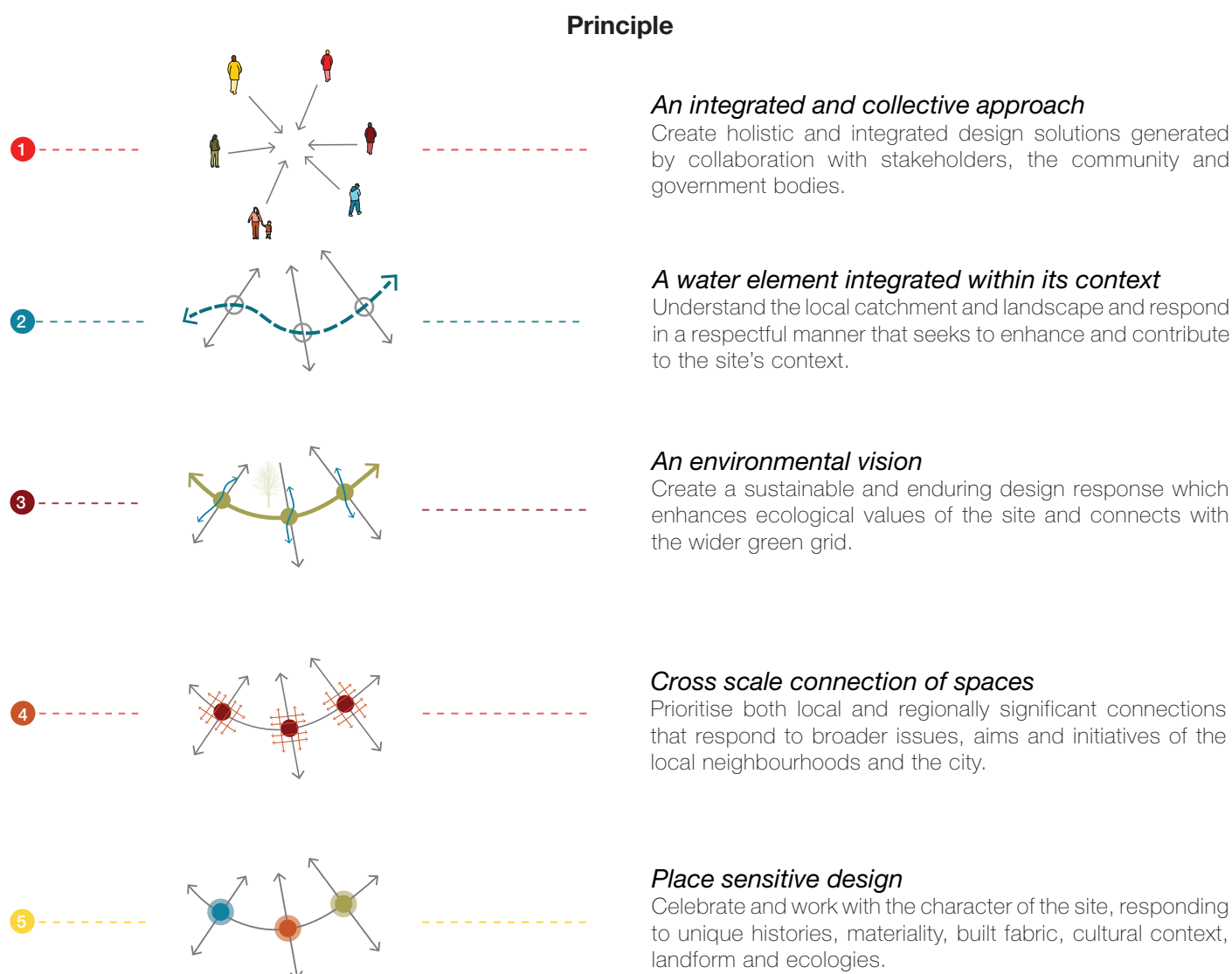




Figure 3.10 Principle & Objectives Diagram





## 3.2 Design Objectives



The design objectives are site specific responses to the design principles and have been generated based on the site analysis and initial workshops with stakeholders. These objectives will be used to guide the concept designs and assess them as they progress.



### Objectives

- 
- 
- Work with stakeholders to deliver the project
  - Hold regular stakeholder workshops to contribute to design options
  - Acknowledge the cultural diversity and backgrounds of park users
  - Engage the local community and foster a sense custodianship of the waterway and landscape

- 
- 
- Create opportunities for ecological restoration in harmony with existing ecological assets
  - Use the existing topography to inspire water quality improvement elements in the park
  - Integrate water quality treatment elements with other site objectives such as park user amenity, improved access and movement
  - Interpret historical creek line within the works

- 
- 
- Utilise durable, sustainable and long lasting materials and timeless design
  - Reuse materials on site wherever possible to minimise project footprint
  - Explore environmental education opportunities integrated within the design response
  - Use endemic plant species to build on existing site planting, including shrub and groundcover planting
  - Maintain and enhance small bird habitat currently provided by overgrown creek corridor

- 
- 
- Enhance connectivity with local streets, facilities, neighbourhoods and green spaces
  - Enhance north-south and east-west park connections and connect existing park assets e.g. playground, Toongabbie Creek
  - Ensure equal access for all by creating safe spaces

- 
- 
- Respect and respond to the local cultural context
  - Increase the legibility of the site and create spaces for the community to meet and interact
  - Enhance the rich canopy cover found throughout the site
  - Explore a range of active and passive recreation to create a valuable green space for local residents
  - Maintain the unique and tranquil characteristic of the park through design







## 4.0 LANDSCAPE IMPROVEMENT PLAN

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## 4.1 Community Engagement

Prior to developing the Milson Park Improvement Plan, Sydney Water and City of Parramatta Council undertook a range of community engagement activities to enable local residents to have their say as to what Milson Park should look like. Shannons Paddock was also included in the discussions with the community due to its close proximity and the complementary uses possible in this park. Shannons Paddock will be the subject of a separate Improvement Plan to be undertaken at a later date.

The community engagement consisted of a number of opportunities for the community to provide feedback to the project team on how they currently use both Milson Park (the subject of this Upgrade Plan) and Shannons Paddock (the subject of a future Upgrade Plan) and what future improvements they would like to see. Consultation was for the neighbouring parks of both Milson Park and Shannons Parks. Milson Park is the initial upgrade plan, Shannons Paddock Upgrade Plan will come at a later date.

### Open Day

An open day was held at Shannons Paddock on Saturday 4 November 2017 from 11am - 3pm. A total of 37 people visited the event and provided feedback to the project team. The event was advertised in the Parramatta Sun as well as via Sydney Water's and City of Parramatta's social media channels. A newsletter advertising the event and providing background information on the project was distributed to approximately 1500 residents within a 500m radius of the site.

### Feedback Form

Feedback forms were mailed to surrounding residents in conjunction with the newsletter drop, asking how they use the park/s as well as what they would like to see in the future. The feedback form also asked specific questions around whether the community would like to see existing grass areas replaced with planted stormwater treatment areas to gauge community feeling towards Sydney Water's core works. As of the 22nd of November, 73 feedback forms have been returned.

### Online Feedback Form

An online feedback form mirroring the hardcopy forms used to survey the community at the open day was also uploaded to Sydney Water's [www.sydneyparktalk.com.au](http://www.sydneyparktalk.com.au) website. As of 7 November no surveys have been filled out online.

Following is a summary of the outcomes of the Community Engagement.

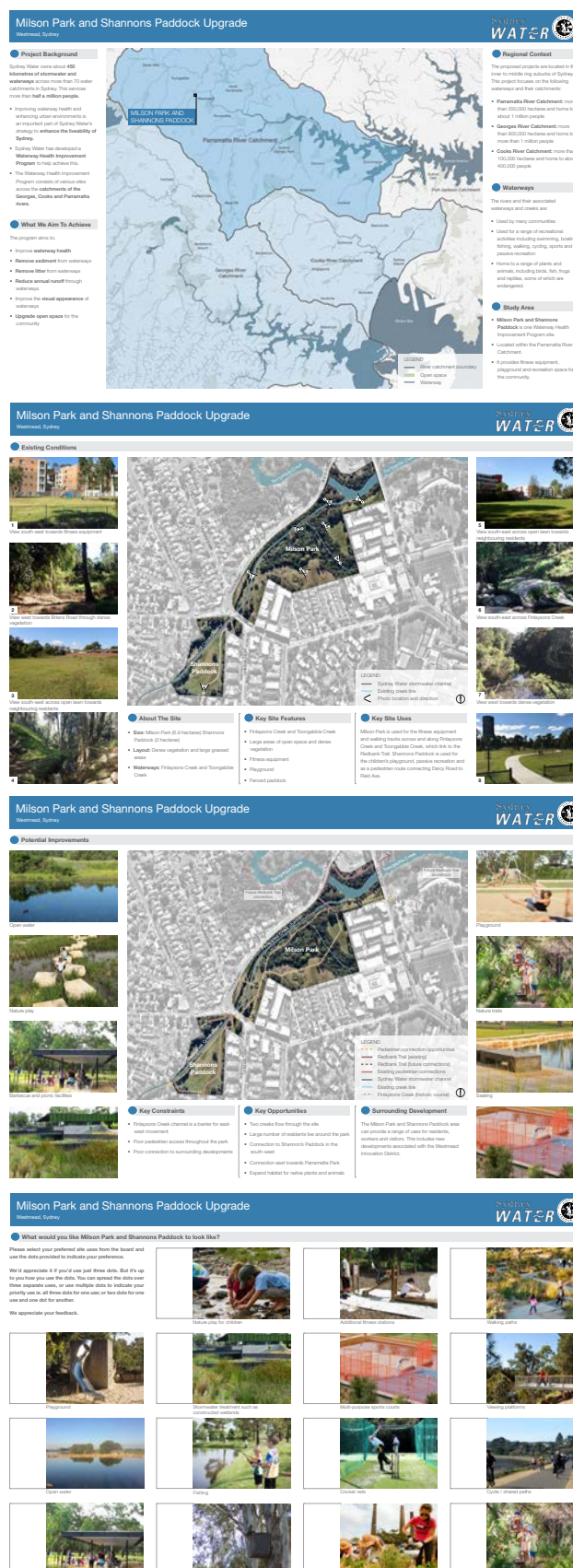


Figure 4.10 Community engagement boards



## Community Engagement Outcomes

The feedback received from the community shows significantly more people use Shannons Paddock than Milson Park. The primary uses of the parks included walking, relaxation, experiencing nature and cycling. Current use is primarily in the afternoon and evenings with little use in the early morning. Most people stay for between 30 minutes and 2 hours, highlighting opportunities for providing facilities to encourage longer stays.

The community indicated a clear preference for additional walking and cycling paths, followed by natural stormwater treatment, community gardens, bush regeneration and habitat improvements, picnic and barbecue areas. Additional play opportunities were also requested.

The 'dot-mocracy' boards used on the day asked the community to select their 3 most desired uses with most popular being nature trails, walking and cycle/shared paths. Bush regeneration and habitat improvement, fishing, nature play for children and stormwater treatment were also popular responses.

A local resident currently agists rescue horses within Milson Park. A community petition with 66 signatures to maintain the presence of rescue horses on the site was received by City of Parramatta Council during the exhibition period of the draft master plan.

Overall the community engagement process highlighted the importance of the parks to the local community, especially those living in the medium-high density areas, close to the parks. Interestingly, Milson Park is used regularly despite the lack of facilities and amenity provided, pointing to its value as an open space asset for the growing local community if upgrades are undertaken and access is improved.



Figure 4.11 Community engagement boards feedback

Q. Which park/s do you use?

44% Shannons Paddock  
26% Both parks  
22% Milson Park  
8% No answer

Q. Do you support the idea of replacing some existing open grassed areas with stormwater treatment areas? Unsure 9%

YES 60% NO 31%

Q. Would you support the following activities/facilities at Milson Park and/or Shannons Paddock?



22% Walking and cycling paths



17% Community gardens



16% Bush regeneration and habitat improvement



15% Stormwater treatment



15% Children's playground



14% Picnic and barbecue areas

## 4.2 Draft Landscape Improvement Plan

Milson Park has been identified as an under utilised and valuable open space for the local community. This project provides the opportunity to improve the range of uses available to the community as well as creating better connections to the park. The local community includes residents in the suburbs of Westmead, Constitution Hill, Wentworthville and Northmead as well as workers in the Westmead Health Precinct.

The strategic location of the park provides an opportunity to improve pedestrian and cycle connections to local and regional attractions including the Westmead Health Precinct, Parramatta Park and the Parramatta CBD.

The draft landscape improvement plan seeks to create a design that balances the community's needs and desires with the protection and enhancement of existing ecological values of the site.

The design aims to create a safe and inviting park environment, that will enable the community to connect with nature and access a currently under utilised open space. The landscape improvement plan is made up of the following 3 zones.

01. Village Green and Finlaysons Creek naturalisation
02. Milson Park ecological zone
03. Milson Park northern zone.



Figure 4.20 Landscape Improvement Plan







## 4.2 Revised Landscape Improvement Plan

During the public exhibition of the Landscape Improvement Plan for Milson Park further detailed assessments were undertaken at the site, including geotechnical testing and detailed site survey works. A number of issues and opportunities were identified including;

- low levels of creeks where stormwater diversions were to be located,
- high risk to construction costs due to deep excavation,
- opportunity to pump flows from Finlaysons Creek,
- locations of existing trees.

In response to these issues and opportunities a revised design has been produced that minimises excavation by pumping flows from Finlaysons Creek into the planted stormwater treatment system. The opportunity was also taken through the process of revising the design to respond to the strong local community sentiment to retain a space to house local rescue horses on the site.

The stormwater treatment areas have been relocated out of the zone impacted by flood waters, meaning they are now located where the previous design indicated landscaped mounds would be constructed.

The main pathway has also been relocated slightly to respond to the new treatment location, as well as avoiding the removal of existing trees where the pathway crosses the creek to the east.

The overall zoning, functions and amenity of the park remain similar to the previous proposal. This includes opportunities for walking, jogging, cycling, engaging with nature, picnicking, nature play opportunities and spaces for relaxing. Large areas of the park, particularly along the creek lines, will be retained as habitat areas for flora and fauna.



Figure 4.20 Landscape Improvement Plan







#### 4.2.1 Village Green and Finlayson Creek naturalisation

In the southern zone of Milson Park adjacent to Briens Road and Darcy Road it is proposed to naturalise the existing Finlaysons Creek concrete channel and realign the concrete channel to create a larger more usable area for open space. It is proposed to include a new entrance to the park on its southern boundary and to provide a shared path connection as a through link connecting Milson Park to the Westmead Hospital Precinct.

The proposed new village green area will create a formalised open space area for the local community and will provide a new turf area. There is an option for minor re-leveling to create a more even surface for informal ball games. The village green will also provide opportunities for picnics and barbecues in the park. The village green is designed to take advantage of the cooler microclimate provided by the creekline and the water running through the creekline as well as the existing trees in the park providing shade.

The naturalisation of Finlaysons Creek would include removal of the section of concrete channel in Milson Park between the existing culvert under Darcy Rd and the existing naturalised section of Finlaysons Creek within Milson Park. The channel naturalisation would involve vegetated natural banks to the creek, a natural bed to the creek including rocks and planting and potential for pools and riffles where the topography allows.

It is also proposed to include a very simple nature play area adjacent to the bushland. The nature play would include opportunities for interaction with an extended ecological area adjacent to the existing vegetation as well as natural play elements such as paths through the vegetation, timber play elements, rocks for climbing and loose surface elements such as rocks and sand, and opportunities for creative and imaginative play.



Figure 4.21 Landscape Improvement Plan - Village Green and Finlaysons



There are a number of large trees adjacent to Darcy Road, including a very large remnant *Eucalyptus tereticornis*. It is proposed to retain these trees and to create a native meadow underneath these trees which will be a part of a new southern entrance to Milson Park. This includes new proposed signage to the park. The native meadow would provide understorey planting to protect any damage to the trees from mowing. The new entrance to the park will be an important element to encourage and attract people into the central portion of the park which currently is not easily visible from the surrounding streets.

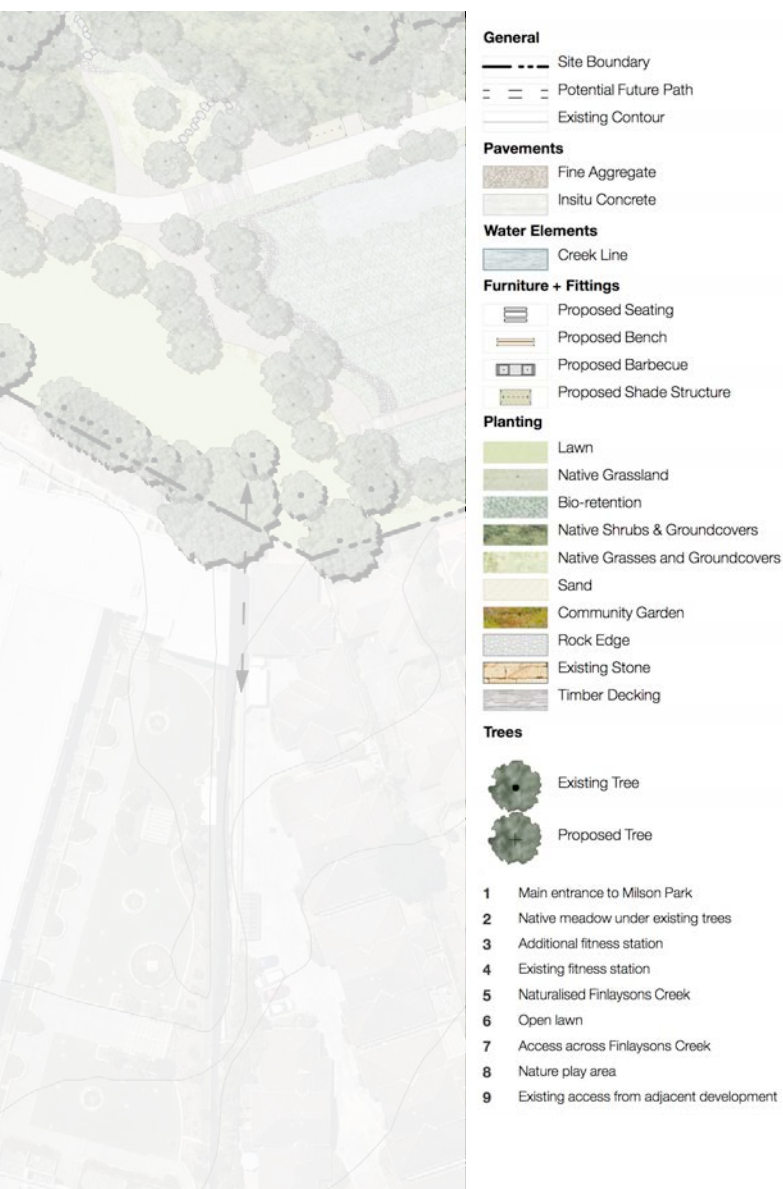


Figure 4.22 Naturalised creek line



Figure 4.23 Ecological enhancement - Bee totem poles



Figure 4.24 Nature play



#### 4.2.2 Milson Park Ecological Zone

In the central zone of Milson Park there is currently valuable ecological communities and good habitat for a range of fauna, particularly small birds. It is proposed to retain and enhance these important vegetation communities and enhance the habitat as part of the works.

It is proposed to include passive recreation opportunities for the local community to enjoy the ecological zone through the provision of nature trails, as well as opportunities for relaxation in nature including seating, shelters and opportunities for picnicking. The central zone will also include the main link through Milson Park, and will connect the southern and northern zones of Milson Park including a proposed new crossing over Milson Creek.

It is proposed to include a natural stormwater filter system including raingardens, wetland areas and open water areas, diverting stormwater flows from Finlaysons Creek through the system before it discharges back into the creek.

The stormwater treatment system will significantly improve the water quality discharging into the downstream reaches of Finlaysons Creek and will create a range of additional habitat features within the ecological zone. The treatment systems will be planted out with locally native vegetation from the Sydney Freshwater Wetland communities as well as the Cumberland Plain Woodland and Cumberland Riverflat Forest communities. At the southern edge to the ecological zone it is proposed to locate an open water zone which captures the treated water and provides for amenity.

The stormwater treatment system will be designed to sit above existing ground levels to minimise the requirement for removing existing soil from the park. It is proposed to relocate any excavated soil material adjacent to the natural stormwater filter system, creating landscape mounds which are planted out with native vegetation and contribute to an enhanced ecological and habitat zone.



Figure 4.25 Landscape Improvement Plan - Milson Park ecological zone



There is an option for a community garden and/or farm to be located in this zone. A community garden was identified during consultation by some members of the community as a desirable use of the park, as was the opportunity to retain space for the horses which currently utilise a part of the park. A community garden/farm could provide an opportunity for the local community who are living in high density residential dwellings, with have limited space for gardening, an opportunity to grow their own herbs, fruits and vegetables or keep livestock if approved by City of Parramatta Council.

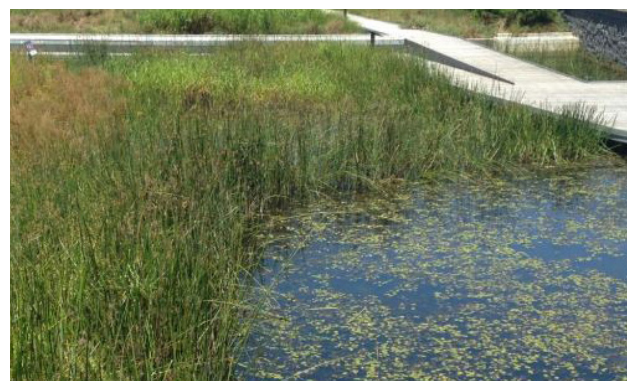


Figure 4.26 Stormwater treatment system



Figure 4.27 Cycle connections



Figure 4.28 Engaging with nature



#### 4.2.3 Milson Park Northern Zone

The northern zone of Milson Park currently consists of areas of turf and scattered trees. It is surrounded to the south by multi-storey residential apartments and to the north by creeklines. Toongabbie Creek is a dominant feature of this zone with its steep banks providing opportunities for views along the creek. This zone also includes the junction of Finlaysons Creek and Toongabbie Creek and a rocky outcrop near this junction which is an interesting natural feature. The area also has important indigenous heritage related to the natural features of the site.

The landscape improvement plan for this zone proposes to highlight the natural assets including the creek and rocky outcrops in the creeklines. It is proposed to provide a viewing area close to the creek junction to provide views looking north along Toongabbie Creek. It is also proposed to enhance the connections to the existing bush track crossing over Finlaysons Creek and connecting to Briens Road. Feedback from the community was that this track was an important connection to public transport buses along Briens Road.

The two existing turf areas in this zone are proposed to be formalised and where appropriate re-levelled to provide for more even surfaces for informal ball games and passive recreation. It is proposed to frame these areas by enhancing the existing vegetation and creating path edges to delineate the passive open spaces from the bushland areas.

In the northern zone it is also proposed to provide opportunities such as seating, benches, shade structures, and barbecue spaces. This area has the potential to be used in the future by the community as well as employees, patients and visitors to the expanded Westmead Hospital precinct due to its close proximity to these facilities.

This zone also provides an important connections to the north and allows for future connections to the Parramatta Ways shared path as well as the Redbank Trail. It also connects to Mons Road and across Finlaysons Creek to Briens Road. It provides an important role in providing connectivity to the adjacent surrounding areas to the north of the park.



Figure 4.29 Landscape Improvement Plan - Milson Park northern zone





- General**
- Site Boundary
  - Potential Future Path
  - Existing Contour
- Pavements**
- Fine Aggregate
  - Insitu Concrete
- Water Elements**
- Creek Line
- Furniture + Fittings**
- Proposed Seating
  - Proposed Bench
  - Proposed Barbecue
  - Proposed Shade Structure
- Planting**
- Lawn
  - Native Grassland
  - Bio-retention
  - Native Shrubs & Groundcovers
  - Native Grasses and Groundcovers
  - Sand
  - Community Garden
  - Rock Edge
  - Existing Stone
  - Timber Decking
- Trees**
- Existing Tree
  - Proposed Tree
- 20 Barbecue area with seating and shade  
 21 Upgrade access to Briens Road  
 22 Retain existing rock  
 23 Connection under Mons Road to the Redbank Trail  
 24 Connection to Mons Road  
 25 Existing Redbank Trail section



Figure 4.30 Viewing deck

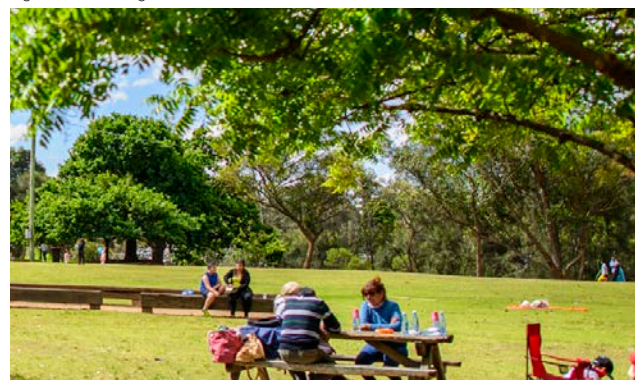


Figure 4.31 Open lawn



Figure 4.32 Barbecue area with seating and shade



### 4.3.1 A Water Element Integrated within its Context

The project is able to achieve significant water quality outcomes. The proposed design is able to treat a large upstream catchment of more than 90 hectares to best practice. Treating this water will remove significant outputs of pollutants including:

- Total Suspended Sediment 58,930 kg/year
- Total Phosphorus 75 kg/year
- Total Nitrogen 401 kg/year.

By treating this large upstream catchment, the stormwater treatment system is helping to achieve the City of Parramatta's vision of bringing back swimming to the Parramatta River. For more information on the City of Parramatta's vision, visit <http://www.ourlivingriver.com.au>.

The proposed design also achieves protection of the Cumberland Plain woodland on site and enhances these native vegetation communities. The proposed design also includes naturalisation of the existing concrete channel by replacing it with a natural channel to improve the ecology and amenity of Finlaysons Creek.



Figure 4.33 Biofiltration at Edinburgh Gardens, Melbourne



### 4.3.2 An Environmental Vision

Milson Park has been identified as having a number of ecological assets. These include:

- Cumberland Woodlands Swamp Oak Forest Endangered Ecological Community (EEC)
- Cumberland Woodlands Riverflat Forest Endangered Ecological Community (EEC)
- A high diversity of birds, particularly small birds which utilise the dense understorey for shelter
- Use of the site by a range of microbat species for both habitat and foraging
- Use of the site by a range of other fauna including frogs and lizards
- A significant large remnant *Eucalyptus tereticornis*
- A remnant of Finlayson Creek channel
- Connection to Toongabie Creek and Finlayson Creek.

The site is of particular importance for small bird habitat because of the nature of the dense understorey on site and the large connected area of vegetation. A wide number of bird species have been identified at the site which have not been found at other sites in the local area. It is considered to have one of the highest diversity of bird species in Parramatta LGA.

The proposed design is to protect and enhance the ecological assets on site. To enhance the existing ecological assets it is proposed to:

- Replace sections of weedy vegetation with native vegetation. A large area of the vegetation is considered to be dominated by woody weeds (predominantly privet) and a weedy understorey (particularly lantana)
- Undertake staged clearance of the weeds and replacement planting with native vegetation to ensure that habitat is retained for small birds. The staged removal of the vegetation will occur over a number of years to allow any new planted vegetation to establish
- Re-direct treated flows into the old remnant channel at the site to help provide a more natural hydrological regime to the EEC

It is also proposed to create habitat by:

- Creating additional planting, including through the proposed stormwater treatment and in areas at the site which are currently dominated by pasture grasses
- Creating new habitat on site such as freshwater wetland areas and open water zones to encourage aquatic species such as frogs
- Installing selected habitat features such as woody debris suitable for native bees and designed 'bat flaps' habitat for microbats
- Installing new hollows for birds, possums and other similar species

Refer to Appendix O1 for the environmental assessment at Milson Park.



Figure 4.34 Dense weedy vegetation



Figure 4.35 Existing creek line



### 4.3.3 Cross Scale Connection of Spaces

The Milson Park upgrade will provide approximately 850 m of the proposed Parramatta Bike Plan route that will travel through Milson Park. The proposed plan also links these new paths to the existing Redbank trail and new connections over Finlaysons Creek.

A secondary path network is also created, forming loops of varying lengths which will enable the community to use the park for walking, dog walking, jogging, cycling etc.

Potential future connections to Darcy Road should also be explored if land between the park and Darcy Road is redeveloped in the future. The locations shown on the plan are indicative only and any future connections will require further assessment by City of Parramatta Council should redevelopment of any of these sites be proposed.

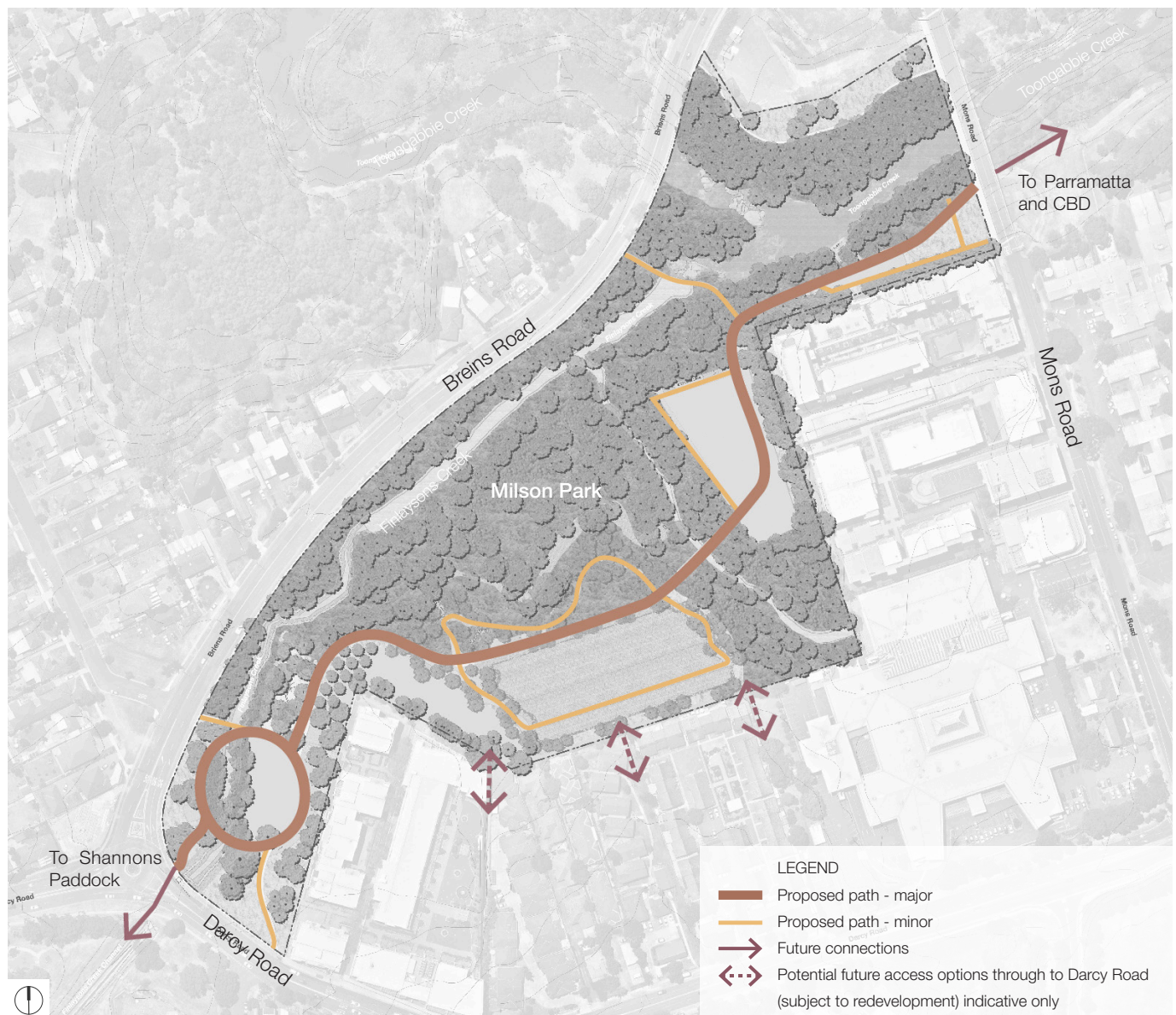


Figure 4.36 Improved connectivity at Milson Park



#### 4.3.4 Place Sensitive Design

Milson Park currently has limited amenity and limited site features. The design at Milson Park proposes to take advantage of the existing native vegetation to create a new parkland in a bushland setting. The proposed design approach to the park will be to create a place to enjoy and relax in nature. This amenity will be available for the local community as well as visitors, employees and patients at the Westmead Hospital Precinct. The amenity at the park will incorporate the existing natural assets such as the bushland areas, the creek line and the proposed stormwater treatment which will contribute to the natural amenity of the site.

The park upgrade increases amenity by providing:

- Additional native planting areas through the treatment zone and ecological restoration area

- Additional footpaths through the park
- Seating and shade structures
- Decks, boardwalks and viewing platforms
- Barbecue and picnic facilities
- Additional planting including tree planting within the park.

The design also proposes to provide a safe and secure path connection through the site.



Figure 4.37 Bioretention system at Joynton Park, Zetland



Figure 4.38 Furniture at Fairwater Park, Blacktown



Figure 4.39 Native planting and paths at Lizard Log Playground



Figure 4.40 Stormwater treatment system at Blacktown Showground



#### 4.3.4 Place Sensitive Design [cont.]

Milson Park currently has limited recreation facilities besides the fitness station and informal walking paths. The proposed design at Milson Park provides for improved recreation opportunities at the site. Due to the likely re-development associated with the Westmead Hospital Precinct, there is likely to be an increased demand for open space and a variety of recreational needs. The upgrades to Milson Park will help to meet the existing and future recreational needs of the community

The park upgrade increases recreation facilities by providing:

- Nature play opportunities
- Bike and scooter tracks
- Additional pathways and connectivity
- New open space area adjacent to Darcy Road

- Formalised and upgraded lawn areas in the northern area of the park
- Nature based recreation including bird watching and potential fishing
- Opportunities for additional exercise stations
- Opportunities for community gardens and similar activities
- Facilities for picnics and informal social gatherings.



Figure 4.41 Lizard Log Parklands, Sydney



Figure 4.42 Nature play



Figure 4.43 Fitness station



Figure 4.44 Open lawn areas



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5.0

## APPENDICES

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## Appendix 1

### Ecological Opportunities